

COUNTY OF SAN BERNARDINO
GENERAL PLAN AMENDMENT AND
GREENHOUSE GAS REDUCTION PLAN
VOLUME 2 - DRAFT SUPPLEMENTAL PROGRAM
ENVIRONMENTAL IMPACT REPORT

SCH No. 2005101038

Prepared for:

COUNTY OF SAN BERNARDINO
LAND USE SERVICES DEPARTMENT
385 N. ARROWHEAD AVENUE, FIRST FLOOR
SAN BERNARDINO, CA 92415

Prepared by:



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TORRANCE, CA 90501

MARCH 2011

(REVISED SEPTEMBER 2011 BASED ON REVISIONS FROM THE FINAL SUPPLEMENT PROGRAM
ENVIRONMENTAL IMPACT REPORT AND GREENHOUSE GAS REDUCTION PLAN)

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Environmental Impact Report and Greenhouse Gas Reduction Plan)

EXECUTIVE SUMMARY

ES.1	Purpose and Scope of the Draft SEIR	ES-1
ES.2	Project characteristics	ES-1
ES.3	Project Alternatives Summary	ES-1
ES.4	Relationship to the Previous General Plan and EIR	ES-2
ES.5	Effects Found Not to Be Significant	ES-2
ES.6	Issues to Be Resolved and Areas of Controversy	ES-3
ES.6	Summary of Impacts and Mitigation Measures	ES-3

1.0 INTRODUCTION

1.1.1	Document and Purpose	1.0-1
1.2	Public Review of the Notice of Preparation	1.0-3
1.3	Areas of Controversy and Issues to Be Resolved	1.0-3
1.4	Organization and Scope of SEIR	1.0-4

2.0 PROJECT DESCRIPTION

2.1	Project Location	2.0-1
2.2	Existing Conditions/History	2.0-5
2.3	Project Objectives	2.0-5
2.4	Project Characteristics	2.0-5
2.5	Regulatory Requirements, Permits, and approvals	2.0-37
2.6	Application of the GHG Plan to Future CEQA Reviews and Specific Projects	2.0-38

3.0 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

3.1	Aesthetics and Visual Resources	3.1-1
3.2	Agricultural and Forestry Resources	3.2-1
3.3	Air Quality	3.3-1
3.4	Biological Resources	3.4-1
3.5	Cultural and Paleontological Resources	3.5-1
3.6	Hazards and Hazardous Materials	3.6-1
3.7	Hydrology and Water Quality	3.7-1
3.8	Noise	3.8-1
3.9	Public Services and Utilities	3.9-1
3.10	Transportation and Circulation	3.10-1
3.11	Climate Change and Greenhouse Gases	3.11-1

4.0 ALTERNATIVES

4.1	Introduction to the Alternatives Analysis	4.0-1
4.2	Overview of the Alternatives Analysis in the General Plan EIR	4.0-2
4.3	Supplemental EIR Alternatives Addressing Project Impacts	4.0-5
4.4	Alternative Comparison	4.0-8

TABLE OF CONTENTS

5.0 OTHER CEQA ANALYSIS

5.1	Cumulative Impacts.....	5.0-1
5.2	Effects Found Not To Be Cumulatively Significant.....	5.0-4
5.3	Significant Unavoidable Impacts	5.0-4
5.4	Growth-Inducing Impacts.....	5.0-7
5.6	Significant Irreversible Environmental Changes	5.0-7

6.0 REFERENCES

7.0 REPORT PREPARERS

APPENDIX

Appendix A - Notice of Preparation/Initial Study and Comments Received

Appendix B - County of San Bernardino Draft Greenhouse Gas Emissions Reduction Plan

TABLES

Table 2-1	San Bernardino County External Emissions Summary	2.0-10
Table 2-2	San Bernardino County Internal Emissions Summary	2.0-11
Table 2-3	External Reductions by Sector.....	2.0-13
Table 2-4	Summary of Internal Reductions by Sector.....	2.0-13
Table 2-5	External GHG Emission Reductions from Building Energy Use Strategies	2.0-16
Table 2-6	External GHG Emission Reductions from Land Use and Transportation Strategies	2.0-17
Table 2-7	External GHG Emission Reductions from Waste Strategies	2.0-19
Table 2-8	External GHG Emission Reductions from Stationary Source Strategies.....	2.0-20
Table 2-9	External Emission Reductions from Agriculture and Resource Conservation Strategies	2.0-20
Table 2-10	External GHG Emission Reductions from Water Conservation Strategies	2.0-21
Table 2-11	Internal GHG Emission Reductions from Building Energy Use Strategies	2.0-22
Table 2-12	Internal GHG Emission Reductions from Vehicle/Fuels Strategies	2.0-23
Table 2-13	Internal GHG Emission Reductions from Waste Strategies.....	2.0-24
Table 2-14	Internal GHG Emission Reductions from Employee Commute Strategies	2.0-25
Table 3-1 R1	Reduction Measures and Associated Functional Equivalent Documents	3.0-4
Table 3.1-1	Eligible State Scenic Routes in San Bernardino County.....	3.1-3
Table 3.1-2	County Designated Scenic Routes	3.1-4
Table 3.2-1	Farmland in San Bernardino County	3.2-3
Table 3.2-2	Farmland Conversion in San Bernardino County 2006–2008.....	3.2-3
Table 3.3-1	Federal and State Ambient Air Quality Standards	3.3-2
Table 3.3-2	Ambient Air Quality Monitoring Data for San Bernardino County	3.3-3
Table 3.3-3	Federal and State Ambient Air Quality Attainment Status for San Bernardino County	3.3-6
Table 3.3-4	Thresholds of Significance for Construction Operations in the South Coast Air Basin.....	3.3-14
Table 3.3-5	Thresholds of Significance for Construction Operations in the Mojave Desert Air Basin.....	3.3-15
Table 3.4-1	Native Vegetation Types and Plant Communities within the Valley Region	3.4-1
Table 3.4-2	Native Vegetation Types and Plant Communities within the Mountain Region	3.4-3
Table 3.4-3	Native Vegetation Types and Plant Communities within the Desert Region.....	3.4-5

Table 3.6-1	Known Hazardous Waste Sites in the County Planning Area Department of Toxic Substances Control.....	3.6-2
Table 3.8-1	Typical Construction Equipment Noise Levels.....	3.8-8
Table 3.9.1-1	San Bernardino County Fire Department Divisions.....	3.9-1
Table 3.9.1-2	Fire Protection Districts.....	3.9-2
Table 3.9.1-3	County Service Areas.....	3.9-2
Table 3.9.2-1	CUWCC Revised BMPs.....	3.9-11
Table 3.11-1	Global Warming Potential for Greenhouse Gases (100-Year Given Time Horizon)	3.11- Error! Bookmark not defined.
Table 3.11-2	External Emissions Inventory Summary for 2007 (Baseline) and Unmitigated Year 2020 (MTCO _{2e}).....	3.11-17
Table 3.11-3	Internal Emissions Inventory Summary for 2007 (Baseline) and Unmitigated Year 2020 (MTCO _{2e}).....	3.11-18
Table 3.11-4	External GHG Emissions Reductions From GHG Plan Reduction Measures (MTCO _{2e})	3.11-22
Table 3.11-5	Internal GHG Emissions Reductions From GHG Plan Reduction Measures (MTCO _{2e})	3.11-23
Table 4.0-1	Summary Comparison of Alternatives	4.0-9

FIGURE

Figure 2-1	San Bernardino County Location and Jurisdictional Entities in the County	2.0-3
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EXECUTIVE SUMMARY

ES.1 PURPOSE AND SCOPE OF THE DRAFT SEIR

The primary purpose of this Final SEIR is to satisfy CEQA requirements by addressing the environmental effects specific to the proposed General Plan Amendment, Greenhouse Gas Reduction Plan, and associated Development Code Amendment (referred to collectively hereafter as the proposed project). The Final SEIR will address the environmental effects of implementing the proposed project in light of the previous environmental review in the San Bernardino County General Plan Program EIR (General Plan EIR) as provided for under CEQA Guidelines 15162 and 15163. Specifically, the Final SEIR evaluates whether the proposed project would result in new significant environmental effects not previously addressed in the San Bernardino County General Plan Program EIR (State Clearinghouse No. 2005101038) or a substantial increase in the severity of previously identified significant environmental effects consistent with CEQA Guidelines Section 15162(a)(1). Implementation of the proposed GHG Plan will address climate change and greenhouse gas emissions impacts associated with the County of San Bernardino 2007 General Plan.

ES.2 PROJECT CHARACTERISTICS

The County of San Bernardino is proposing a General Plan Amendment and associated Greenhouse Gas Reduction Plan (GHG Plan). The project also includes a Development Code Amendment that will provide specific procedures for implementing development-related provisions of the GHG Plan. The focus of the Final SEIR is the environmental effects of County implementation of the GHG Plan.

ES.3 PROJECT ALTERNATIVES SUMMARY

The analysis provided in this Final SEIR evaluates whether the changes to the General Plan and its implementation would alter the conclusions of the previous General Plan EIR alternatives analysis. The Draft SEIR also evaluates alternatives specifically associated with the implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment in order to avoid or substantially lessen the increased severity of significant and unavoidable environmental effects identified. These alternatives are summarized briefly below.

- **General Plan EIR Alternative No.1 – No Project Alternative** – Under Alternative No. 1, the General Plan would retain the 1989 General Plan, as amended but would not include the Community Plans developed as part of the proposed project, nor would the County Development Code be updated. This Alternative would allow for a population of about 415,000 people in County unincorporated territory.
- **General Plan EIR Alternative No.2 – Reduced Development Alternative** - Under Alternative No. 2 the County General Plan would only be updated to provide for the growth of the County by 200,000 people, not the approximately 415,000 people that would be accommodated by the of the 2007 General Plan. General Plan goals and policies would also be updated as they would as part of the 2007 General Plan.
- **General Plan EIR Alternative No.3 – Future Growth In Cities Sphere-Of-Influence Alternative** - Under Alternative No. 3 the County General Plan would be updated to accommodate the growth in the County by approximately 409,000 people. However, all the new growth in the County would only occur within the adopted spheres-of-influence of the cities within the County. This Alternative includes the revision to the General Plan goals and policies, although the goals and policies would be somewhat different than

the goals and policies included as part of the 2007 General Plan since all new growth in the County would only occur within city spheres-of-influence.

- **SEIR Alternative No. 1 - No Project Alternative** - Under this alternative, the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code is not adopted and the General Plan and Development Code would remain as they are currently adopted. This alternative is consistent with CEQA Guidelines 15126.6(e)(3)(A).
- **SEIR Alternative No. 2 – Renewable Energy Generating Facility Restriction Alternative** - This alternative is similar to the proposed project and would implement the reduction measures that are proposed in the General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment. However, this alternative differs from the proposed project by adding development standards beyond what is included in the proposed project to reduce the impacts to three resources, specifically aesthetic and visual resources, agricultural resources and biological resources. Alternative 2 would include additional Development Code provisions to Chapter 84.29 (Renewable Energy Generating Facilities) by adding standards that would substantially restrict the location of renewable energy generating facilities in a manner that would substantially lessen the significant and unavoidable impacts to aesthetic and visual resources, agricultural resources and biological resources that would result from the proposed project.

ES.4 RELATIONSHIP TO THE PREVIOUS GENERAL PLAN AND EIR

The County of San Bernardino 2007 General Plan contains a series of linked documents, including the General Plan text and a series of land use, hazard, circulation, and resource overlay maps, a separately bound Housing Element, the community plans, and the background reports. Additionally, the General Plan lists various implementation tools that are incorporated as separate policies and documents. The General Plan EIR analyzed the impacts associated with the development of the General Plan.

The proposed project includes an amendment to the 2007 General Plan, adding a specific policy for the reduction of greenhouse gas emissions, pursuant to which policy the GHG Plan is proposed to be adopted. The GHG Plan will act as an implementation tool similar to those described in the General Plan to guide development in the county by focusing on attaining the various goals and policies of the General Plan and all community plans relative to greenhouse gas (GHG) emissions and to achieve the goals outlined above. The reduction measures described in the GHG Plan will be consistent with the goals, policies, and programs contained in the General Plan.

This Final SEIR is prepared as a Supplemental EIR to the certified General Plan Program EIR, pursuant to the provisions of CEQA Guidelines sections 15162 and 15163. A supplemental EIR augments a previously certified EIR, and contains only the analysis necessary to respond to the proposed project changes that trigger the need for environmental review. Thus this Final SEIR assesses whether the proposed General Plan Amendment, and the associated GHG Plan and proposed Development Code amendments, would result in new or substantially more severe significant environmental impacts.

ES.5 EFFECTS FOUND NOT TO BE SIGNIFICANT

CEQA Guidelines Section 15128 requires an EIR to briefly describe any possible significant effects that were determined not to be significant and were therefore not discussed in detail in the Draft SEIR. For purposes of this Final SEIR, the following topics were eliminated from further evaluation in the scoping phase of the supplemental environmental analysis because the revisions to the project or changed conditions would not have a substantial effect on these resources beyond what was evaluated in the General Plan EIR: geology and soils, land use and planning, mineral resources, population and housing, and recreation.

ES.6 ISSUES TO BE RESOLVED AND AREAS OF CONTROVERSY

Chapter 1.0, Introduction, provides a description of issues that have been identified to date since release of the Notice of Preparation. These issues include having the GHG Plan consider utilizing a per capita reduction target for greenhouse gas emissions, ensuring that the reduction measures in the GHG Plan are enforceable and quantified and address all options, and that the EIR address biological resources, water supply, and land use.

ES.7 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Table ES-1 provides a summary of project impacts and mitigation measures identified in the Draft SEIR.

TABLE ES-1
EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>3.1 Aesthetics and Visual Resources</p> <p>Impact 3.1.1</p> <p>The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts to scenic vistas, scenic resources, and the existing scenic character of the county (General Plan EIR Impacts AES-1 and 2). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. However, subsequent implementation of GHG Plan reduction measures that provide for renewable energy facilities could result in an increased severity of scenic impacts beyond what was considered in the General Plan EIR.</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact.</p>	<p>None available.</p>	<p>Substantial increase in severity of this impact that would result from the proposed Project is a significant and unavoidable impact.</p>
<p>Impact 3.1.2</p> <p>The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts associated in glare and nighttime lighting (General Plan EIR Impact AES-3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project would not increase the severity of nighttime lighting impacts. However, subsequent implementation of GHG Plan reduction measures that provide for renewable energy</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact.</p>	<p>MM 3.1.2</p> <p>Development Code Section 84.29.040 (Solar Energy Development Standards) shall be amended to include the following standard for glare:</p> <ul style="list-style-type: none"> Solar energy facilities shall be designed to preclude daytime glare on any abutting residential land use zoning district, residential parcel, or public right-of-way. 	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
3.2 Agricultural and Forestry Resources			
<p>Impact 3.2.1</p> <p>The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts to agricultural uses in the county due to urban expansion and economic considerations (General Plan EIR Impacts AG-1 and 2). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. However, renewable energy generating facilities promoted by the GHG Plan reduction measures are an allowed use in the Agriculture Zone and could result in increased severity of agricultural use impacts beyond what was considered in the General Plan EIR.</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact.</p>	<p>MM 3.2.1</p> <p>Development Code Chapter 84.29 (Renewable Energy Facilities) shall be amended to include the following standard:</p> <ul style="list-style-type: none"> Work with transmission line providers and developers to design and cite supporting off-site facilities such as transmission lines, in a manner that will allow for continued use of adjoining agricultural operations as long as the agricultural operations do not interfere with the transmission right-of-way. 	<p>Substantial increase in severity of this impact that would result from the proposed Project is a significant and unavoidable impact.</p>
<p>Impact 3.2.2</p> <p>The General Plan EIR did not evaluate potential physical environmental effects to forest lands resulting from implementation of the General Plan as such provisions of Appendix G did not exist at the time the General Plan EIR was prepared. Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not result in forest impacts.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>3.3 Air Quality</p> <p>Impact 3.3.1</p> <p>The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts to air quality (General Plan EIR Impacts AQ-1, 2, and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not result in increased severity of these impacts. In addition, implementation of these General Plan and Development Code provisions would ensure that construction air pollutant emissions are addressed.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.4 Biological Resources</p> <p>Impact 3.4.1</p> <p>The General Plan EIR and the General Plan CEQA Findings found that, despite the imposition of certain mitigation measures, impacts to some sensitive and special-status species and their associated habitat and migratory corridors resulting from implementation of the 2007 General Plan cannot be fully mitigated to a level below significance (General Plan EIR Impacts BIO-1, 2, 3, 8, 9, 13, 14, and 16). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project does not result in an increased severity of</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact.</p>	<p>MM 3.4.1a</p> <p>Development Code Chapter 84.29 (Renewable Energy Facilities) shall be amended to include the following standard for transmission line design:</p> <ul style="list-style-type: none"> Transmission lines and all electrical components shall be designed, installed, and maintained to reduce the likelihood of large bird electrocutions and collisions and each line will be evaluated for potential collision risks. 	<p>Substantial increase in severity of this impact that would result from the proposed Project is a significant and unavoidable impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>these impacts. However, subsequent implementation of the GHG Plan reduction measures that provide for renewable energy generating facilities could result in increased severity of biological resource impacts than was considered in the General Plan EIR.</p>		<p>MM 3.4.1b</p> <p>Development Code Chapter 84.29.030 (Wind Energy Development standards) shall be amended to include the following standards:</p> <ul style="list-style-type: none"> • The design of wind energy facilities will discourage the use of the site by avian species (provision of landscaping and ground conditions that are unattractive to avian species). • Design and siting of wind turbines associated with lighting, avoidance placement of turbines on or immediately adjacent to the upwind side of ridge crests, and other design features to minimize impacts to bat and avian species. • Provision of an avian and bat management plan that includes mortality monitoring and additional measures to address unanticipated significant adverse impacts on the population of avian or bat species or with any migratory corridor. 	

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Impact 3.4.2</p> <p>The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, impacts to wetland and riparian habitat in some areas of the county resulting from implementation of the 2007 General Plan cannot be fully mitigated to a level below significance (General Plan EIR Impacts BIO-2, 3, 8, 9, 4, and 16). While construction activity associated with implementation of the proposed Project may temporarily disturb wetland or riparian habitats and/or other biological resources, implementation of General Plan policy provisions and the continued enforcement of the County Development Code would generally ensure that implementation of the proposed Project would not result in increased severity of these impacts. The proposed Project would not result in a new impact that was not addressed in the General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.4.3</p> <p>The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding the potential to conflict with any habitat conservation plans due to the imposition of mitigation measures (General Plan EIR Impacts BIO-5, 6, 12, 17, and 18). Implementation of General Plan policy provisions would ensure that implementation of the proposed Project would not result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>3.5 Cultural and Paleontological Resources</p> <p>Impact 3.5.1 General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to historical resources due to the adoption of mitigation measures (General Plan EIR Impact CR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of historic resource impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.5.2 General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to archaeological resources due to the adoption of mitigation measures (General Plan EIR Impact CR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of archaeological resource impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Impact 3.5.3 General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to paleontological resources due to the adoption of mitigation measures (General Plan EIR Impact CR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of paleontological resource impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.6 Hazards and Hazardous Materials</p>			
<p>Impact 3.6.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding the release of hazardous materials (General Plan EIR Impacts HAZ-1, 2, 3, 4 and 5). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of hazard impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Impact 3.6.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a significant and unavoidable impact regarding wildland fires (General Plan EIR Impacts HAZ- 6). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of this impact.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.7 Hydrology and Water Quality</p>			
<p>Impact 3.7.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to groundwater supplies and groundwater recharge (General Plan EIR Impact HWQ-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of groundwater impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.7.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to groundwater quality (General Plan EIR Impact HWQ-2). Implementation of the proposed Project could result in increased erosion and stormwater runoff, which could degrade groundwater quality. Implementation of General Plan policy provisions and the continued</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of groundwater quality impacts or result in a new impact that was not addressed in the General Plan EIR.</p> <p>Impact 3.7.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to drainage and flooding issues (General Plan EIR Impact HWQ-2 and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of drainage and flooding impacts or result in a new impact that was not addressed in the General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.8 Noise</p>			
<p>Impact 3.8.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in less than significant impacts from noise (General Plan EIR Impact N-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of construction noise impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Impact 3.8.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in less than significant impacts from noise impacts (General Plan EIR Impacts N-1 and 2). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of vibration impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.8.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in less than significant impacts from noise impacts (General Plan EIR Impacts N-1, 2, and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of noise impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.9 Public Services and Utilities</p>			
<p>Impact 3.9.1.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to fire protection and emergency medical services (General Plan EIR Impacts PS-2 and 3). Implementation of General Plan policy</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of fire protection service impacts or result in a new impact that was not addressed in the General Plan EIR.</p>			
<p>Impact 3.9.2.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to water supply (General Plan EIR Impacts UT-1, 2, and 3). Implementation of the proposed General Plan Amendment, Greenhouse Gas Reduction Plan, and associated Development Code Amendment would incrementally increase demand for water supply as well as the potential for needed additional water supply infrastructure, both of which could result in significant effects on the physical environment. Implementation of General Plan policy provisions and the continued enforcement of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. This project would not result in a new impact that was not addressed in the General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.9.3.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding wastewater conveyance and treatment (General Plan EIR Impacts UT-4, 5, and 6). Subsequent development under</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>the proposed Project could incrementally increase wastewater flows and require additional infrastructure and treatment capacity to accommodate anticipated demands. However, implementation of General Plan policy provisions and the continued enforcement of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. This project would not result in a new impact that was not addressed in the General Plan EIR.</p>			
<p>Impact 3.9.3.2 The General Plan EIR and General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding stormwater drainage (General Plan EIR Impact HWQ-2). Subsequent development under the proposed Project could increase stormwater flows and require additional infrastructure to accommodate anticipated demands. However, continued implementation of General Plan policy provisions would ensure that no adverse impacts resulting from stormwater drainage issues would occur.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.10 Transportation and Circulation</p>			
<p>Impact 3.10.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding standards for facility operations within the County (General Plan EIR Impact TR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of transportation-related impacts or result in a new impact that was not addressed in General Plan EIR.</p>			
<p>Impact 3.10.2 The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, impacts to facility operations not under the County's jurisdiction, such as freeways and State highways, as well as arterials in incorporated cities within the county and in areas to the County, resulting from implementation of the 2007 General Plan cannot be fully mitigated to a level below significance (General Plan EIR Impacts TR-2 and 3). Implementation of General Plan policy provisions would generally ensure that implementation of the proposed Project would not result in increased severity of these impacts. The proposed Project would not result in a new impact that was not addressed in the General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.10.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding a change in air traffic patterns including either an increase in traffic levels or a change in location that results in substantial safety risks (General Plan EIR Impacts TR- 4). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of air traffic-related impacts or result in a new impact that was not addressed in General Plan EIR.</p>			
<p>Impact 3.10.4 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding hazards resulting due to a design feature or incompatible uses (General Plan EIR Impacts TR- 5). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of roadway or traffic hazard impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.10.5 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding emergency access (General Plan EIR Impacts TR- 6). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of emergency access-related impacts or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Impact 3.10.6 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding public transit, bicycle, and pedestrian facilities (General Plan EIR Impacts TR- 8). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of impacts to public transit systems, or bicycle and pedestrian facilities or result in a new impact that was not addressed in General Plan EIR.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>3.11 Climate Change and Greenhouse Gases</p>			
<p>Impact 3.11.1 Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would implement a number of activities to reduce greenhouse gas emissions that are under the County's jurisdiction to implement. The proposed project's GHG reducing activities are consistent with the early emission reduction targets contained in AB 32 the AB 32 Scoping Plan Report.</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>
<p>Impact 3.11.2 Subsequent implementation of the General Plan in combination with reduction measures under the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment could be exposed to environmental effects associated with climate change. While the exact extent of the environmental effects of climate change on San Bernardino County is not known at this time, current General Plan</p>	<p>No new or substantially more severe significant impact.</p>	<p>None required.</p>	<p>No new or substantially more severe significant impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Cumulative Impacts</p>			
<p>policies and other state and local provisions address these effects. Amending the General Plan to add the GHG reduction policy and adopting the proposed GHG Plan would not increase impacts of climate.</p>			
<p>Impact 5.1 The General Plan EIR found that cumulative impacts to scenic resources would not be considerable with implementation of the General Plan. Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would further contribute to the alteration of the visual character of the region, impacts to scenic vistas, and increased glare/lighting. Subsequent implementation of GHG Plan reduction measures that provide for renewable energy generating facilities would result in an increased severity of scenic impacts beyond what was considered in the General Plan EIR.</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a less than significant impact.</p>	<p>None available.</p>	<p>Substantial increase in severity of this impact that would result from the proposed Project is a significant and unavoidable cumulative impact.</p>
<p>Impact 5.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable cumulative impacts to agricultural resources that cannot be fully mitigated to a level below significance. Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would result in a contribution to the loss of agricultural uses.</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact.</p>	<p>Implement Mitigation Measure MM 3.2.1.</p>	<p>Substantial increase in severity of this impact that would result from the proposed Project is a significant and unavoidable cumulative impact.</p>

ES EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
<p>Impact 5.3</p> <p>The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, cumulative impacts to biological resources from implementation of the General Plan cannot be fully mitigated to a level below significance. The proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would result in an increase in severity of cumulative biological resource impacts identified in the General Plan EIR.</p>	<p>Substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact.</p>	<p>Implement Mitigation Measure MM 3.4.1a and b.</p>	<p>Substantial increase in severity of this impact that would result from the proposed Project is a significant and unavoidable cumulative impact.</p>
<p>There are no new or substantially more severe impacts anticipated from Air Quality, Cultural and Paleontological Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Public Services and Utilities, Transportation and Circulation, and Climate Change and Greenhouse Gases as a result of the proposed project. Therefore, there would be no cumulatively significant impacts related to these areas.</p>			

1.0 INTRODUCTION

This Draft Supplemental Environmental Impact Report (SEIR) has been prepared for the proposed San Bernardino County General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendments (referred to collectively hereafter as the proposed project). It is important to understand the framework surrounding the necessity for this Draft SEIR for the proposed Project and the context of the related documents and regulations. The information below provides a brief description of the guiding regulations and documents that relate to this Draft SEIR.

1.1 DOCUMENT AND PURPOSE

The purpose of this Draft SEIR is to satisfy California Environmental Quality Act (CEQA) requirements by addressing the environmental effects specific to the implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment. Because this document is a supplemental EIR, it will address the environmental effects of implementing the proposed Project in light of the previous environmental review in the San Bernardino County General Plan Program EIR (State Clearinghouse No. 2005101038), as provided for under CEQA Guidelines Sections 15162 and 15163.

When an EIR has been certified for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

- 1) Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- 2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- 3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete, shows any of the following:
 - a) The project will have one or more significant effects not discussed in the previous EIR;
 - b) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - d) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative. (CEQA Guidelines Section 15162[a])

1.0 INTRODUCTION

Section 15163 of the CEQA Guidelines states that a lead agency may choose to prepare a “supplement” to an EIR rather than a “subsequent” EIR if:

- 1) Any of the conditions described in Section 15162 would require the preparation of a subsequent EIR; and
- 2) Only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.

Further, CEQA Guidelines Section 15163 states:

- a) The supplement to the EIR need contain only the information necessary to make the previous EIR adequate for the project as revised.
- b) A supplement to an EIR shall be given the same kind of notice and public review as is given to a draft EIR under Section 15087.
- c) A supplement to an EIR may be circulated by itself without recirculating the previous draft or final EIR.
- d) When the agency decides whether to approve the project, the decision-making body shall consider the previous EIR as revised by the supplemental EIR. A finding under Section 15091 shall be made for each significant effect shown in the previous EIR as revised.

A supplemental EIR (SEIR) augments the EIR prepared for an existing project to address any project changes or changed circumstances since the time the prior document was certified. In the case of changes to a previously approved project, as is the case here, the purpose of an SEIR is to provide the additional analysis necessary to make the previous EIR adequately apply to the project as modified. Accordingly, the SEIR need contain only the analysis necessary to respond to the proposed change in the project that triggered the need for additional environmental review (CEQA Guidelines Section 15163). A subsequent EIR, in contrast, is a complete EIR, largely rewritten, which focuses on the conditions described in Section 15162.

The proposed Project will amend the adopted General Plan by adding one policy that describes the County's goal of reducing those greenhouse gas (GHG) emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations. The remainder of the General Plan remains in effect as previously adopted. Based on the scope of the General Plan amendment, the County has determined that some changes to the previously certified EIR are necessary, but much of the analysis in the previously certified EIR will not need to be changed or supplemented. Therefore, the project does not require a major revision to the previously certified EIR, and a supplemental EIR is the appropriate document to respond to these minor project changes.

This Draft SEIR evaluates the effects of the proposed Project on the physical environment. The environmental analysis will assess whether the proposed Project would result in a new significant environmental effects impact not previously addressed in the General Plan EIR or a substantial increase in severity of previously identified significant environmental effects consistent with CEQA Guidelines Section 15162(a)(1). Implementation of the proposed GHG Plan will address climate change impacts associated with increases in greenhouse gas emissions that were not previously considered in the General Plan EIR. Thus, the proposed Project and this Draft SEIR address substantial changes in circumstances that has occurred (i.e., consideration of climate

change and greenhouse gas emissions as part of environmental review under CEQA) consistent with CEQA Guidelines 15162(a)(2).

This Draft SEIR will not analyze the impacts of environmental issues associated with implementation of the current adopted General Plan (such as growth and development within the county) as they were already adequately addressed in the General Plan EIR.

1.2 PUBLIC REVIEW OF THE NOTICE OF PREPARATION

The Notice of Preparation was submitted for public review on September 20, 2010. As of the close of the public review period (October 20, 2010), two comment cards and five comment letters were received by the County of San Bernardino, the lead agency for the proposal project. The major topics of the received letters that are relevant to the Draft SEIR were that the County set a per capita reduction target; develop a broad range of mitigation measures that are specific and enforceable; address hydrology and water quality impacts, the impacts of land use and zoning changes, as well as to utilities and service systems; use metrics for GHG policies; include more specificity in the plan; notification if the project will supersede USDA Forest Service management; and include extensive alternative approaches.

The comment letters as received are provided in **Appendix A**. **Appendix A** also includes general responses to of the submitted comments. In addition these comments were considered in the preparation of the Draft SEIR, and have been addressed throughout the Draft SEIR as appropriate.

1.3 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

The following general areas of controversy and issues to be resolved were identified during the NOP and Initial Study phases of environmental review of the proposed project:

- Whether a per capita emissions reduction target should be included in the General Plan or in the GHG Plan, and whether the General Plan and GHG Plan should target emissions reductions to 2050, beyond the AB 32 goal of emissions reductions for the year 2020.
- Ensuring that mitigation measures and emissions reduction measures are enforceable and that the benefits of such measures are quantified where feasible.
- Making the plan as specific as possible, with breakdown of such items as transportation emissions into specific categories.
- Impacts of the plan on biological resources, and mitigation for those impacts.
- Reviewing lists of proposed mitigation measures developed by the Attorney General's Office and the California Air Pollution Control Officers Association to determine appropriate measures for San Bernardino County.
- Evaluating water quality and water supply impacts associated with alternative energy projects.
- Evaluating the impacts of any land use or zoning changes associated with the General Plan Amendment and the GHG Plan, and whether the General Plan Amendment and GHG Plan might supersede federal authority on federal lands.

1.0 INTRODUCTION

- Providing a matrix of alternative approaches to achieving greenhouse gas emission reductions.

As noted above, these areas of controversy and issues to be resolved are set forth in more detail in **Appendix A**. General responses to the comments raising many of these issues are set forth in **Appendix A**, and these issues were considered in formulating the analysis set forth throughout the Draft SEIR.

1.4 ORGANIZATION AND SCOPE OF SEIR

This Draft SEIR was prepared in conformance with CEQA Guidelines (Sections 15120 through 15132) and includes the following chapters:

- **Executive Summary** describes the purpose of the Draft SEIR and includes a summary of project characteristics, project alternatives summary, areas of controversy and issues to be resolved, relationship to the General Plan EIR, and summary of impacts and mitigation measures.
- **Chapter 1: Introduction** describes the purpose of the Draft SEIR and provides an overview of the environmental review process.
- **Chapter 2: Project Description** describes the project location, existing conditions, project objectives and characteristics, and regulatory requirements, permits and approvals, purpose and need, objectives and details.
- **Chapter 3: Environmental Analysis** evaluates the adverse and beneficial impacts associated with implementation of the proposed project. The analysis provides an overview of the existing conditions for each issue area being evaluated, a discussion of significance thresholds used to determine the level of potential impacts, an assessment of the potential short- and long-term impacts of the proposed project, and a description of the mitigation measures that would reduce or eliminate those impacts.
- **Chapter 4: Alternatives** updates and supplements the analysis of alternatives contained in the certified Program EIR in two respects. First, this chapter includes an updated analysis of the alternatives previously evaluated in the certified Program EIR in light of the proposed General Plan Amendment and associated GHG Plan and Development Code amendment. Second, this section evaluates new project alternatives (SEIR Alternative No. 1 - No Project Alternative and SEIR Alternative No. 2 – Renewable Energy Generating Facility Restriction Alternative), which would reduce some of the significant adverse environmental impacts associated with the implementation of the General Plan Amendment and associated GHG Plan and Development Code amendment.
- **Chapter 5: Other CEQA Analysis** addresses cumulative impacts and describes those impacts that are considered significant and unavoidable in addition to those effects found to not be significant. The chapter also includes a discussion of growth-inducing impacts associated with the proposed project.
- **Chapter 6: References** lists the documents consulted in the preparation of this document.
- **Chapter 7: Report Preparers** lists those involved with the preparation of the Draft SEIR and those agencies and persons consulted in the preparation of the document.

2.0 PROJECT DESCRIPTION

This chapter provides the description of the proposed Project which consists of the San Bernardino County General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed project). The purpose of the project description is to describe the project in a way that will be meaningful to the public, reviewing agencies, and decision-makers. As described in Section 15124 of the California Quality Act (CEQA) Guidelines, a complete project description must contain the following information but is not required to supply extensive detail beyond that needed for evaluation and review of the potential environmental impacts: (1) the location and boundaries of the project on a regional and detail map; (2) a statement of objectives sought by the proposed project; (3) a general description of the project's economic and environmental characteristics; and (4) a statement briefly describing the intended uses of the Draft SEIR.

2.1 PROJECT LOCATION

The total land area that comprises San Bernardino County is approximately 13 million acres. Federal and state agencies own and control 81 percent (10.5 million acres) of the total county lands (approximately 13 million acres) and approximately 4 percent lies within 24 incorporated cities and is directly regulated by the respective city councils. The County does, however, have a certain degree of influence over the development activity within these cities, primarily involving County owned facilities such as administrative buildings, criminal justice facilities, and certain limited infrastructure, including County-maintained roads on federal land. In addition, public utilities and railroads are generally not subject to the County's land use authority. Water districts/agencies are also not subject to the County's land use authority; however, private water companies generally are.

San Bernardino County is located in the southeast portion of California (see **Figure 2-1**). The county is bordered by Inyo County to the north, the states of Nevada and Arizona to the east, Riverside County and Orange County to the south, and Los Angeles County and Kern County to the west. Interstate 15 traverses most of the county in a north-south direction. San Bernardino County has three distinct regions: the Valley Region, the Mountain Region, and the Desert Region. The Valley Region is the most populated area of the county.

In 2002, the per capita personal income in San Bernardino County was \$23,379, representing an increase of 21.4 percent from 1997. This income was 76 percent of the national per capita income, which was \$30,906. The largest occupational growth in the county was in construction and maintenance occupations (San Bernardino County 2007b, p. IX-19). In 2009, retail trade was the largest of 20 major sectors (Stats Indiana 2010).

The proposed Project addresses the reduction of greenhouse gas (GHG) emissions in the unincorporated areas of San Bernardino County, California, that are under the County's land use authority, as well as all County-owned or -operated facilities and services, whether they are in an incorporated city or town or within an unincorporated area.

2.0 PROJECT DESCRIPTION

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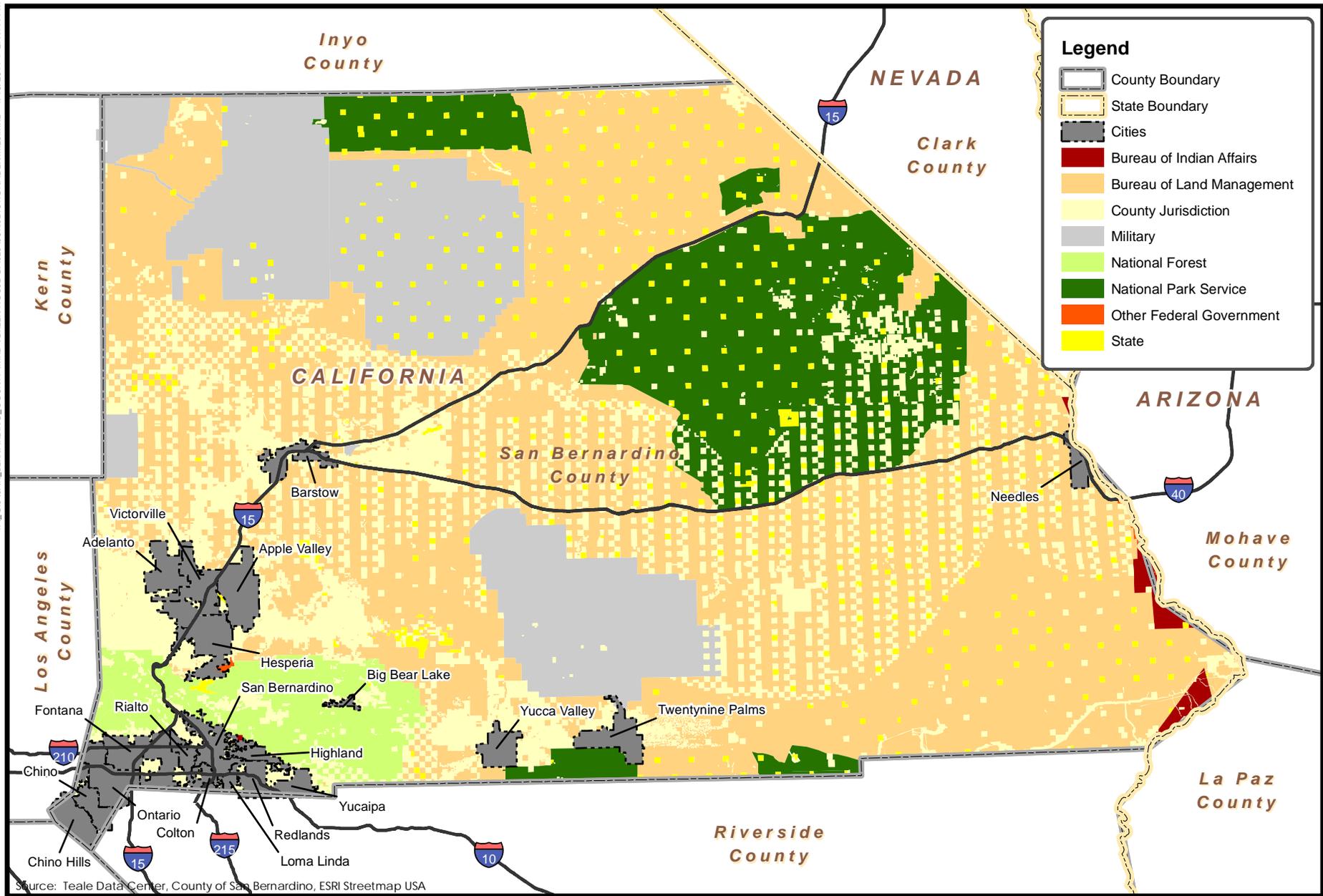


Figure 2-1
San Bernardino County Location and
Jurisdictional Entities in the County

2.2 EXISTING CONDITIONS/HISTORY

Following the County's adoption of its General Plan in March 2007, the California Attorney General filed a lawsuit alleging that the EIR prepared for the General Plan Update did not comply with the requirements of CEQA in its analysis of GHG emissions and climate change. Subsequently, the County and the Attorney General entered into an agreement to settle the lawsuit, which included an agreement by the County to: (1) prepare an amendment to its General Plan adding a policy that describes the County's goal of reducing those GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations; and (2) prepare a GHG Reduction Plan, which includes inventories, a reduction target, and reduction measures to meet the reduction target, by regulating those sources of GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations. A related lawsuit challenging the General Plan EIR was filed by the Center for Biological Diversity and other organizations, and that lawsuit was dismissed following the settlement with the Attorney General. With the dismissal of these lawsuits, the March 2007 approval of the General Plan, and the County's certification of the program EIR for the General Plan, remained in full effect.

The proposed Project described in detail below complies with the provisions of the agreement between the County and the Attorney General.

2.3 PROJECT OBJECTIVES

The County's project objective is to adopt a policy and plan to reduce greenhouse gas emissions, including the following specific objectives:

- Adopt a GHG emissions reduction goal to reduce emissions from activities over which the county has jurisdictional and operational control, consistent with the target reductions of Assembly Bill (AB) 32 and the AB 32 scoping plan. ;
- Provide estimated GHG reductions associated with the County's existing sustainability efforts and integrate the County's sustainability efforts into the discrete actions of the GHG reduction plan;
- Provide a list of discrete actions that will reduce GHG emissions; and,
- Approve a GHG emissions reduction plan that satisfies the requirements of section 15183.5 of the CEQA guidelines, so that compliance with the GHG Plan can be used in appropriate situations to determine the significance of a project's effects relating to GHG emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG Plan.

2.4 PROJECT CHARACTERISTICS

The project consists of the proposed adoption of a General Plan Amendment, a Greenhouse Gas Reduction Plan (GHG Plan), and an associated Development Code Amendment to include greenhouse gas emissions reduction policy provisions and specific procedures for implementing development-related provisions of the GHG Plan in the development code.

Project components are briefly described below.

2.0 PROJECT DESCRIPTION

2.4.1 GENERAL PLAN AMENDMENT

The County proposes to amend its General Plan to include a policy and programs addressing the County's intent to reduce GHG emissions that are reasonably attributable to: (1) the County's internal activities, services, and facilities; and (2) private industry and development that is located within the area subject to the County's land use and building permit authority.

The General Plan Amendment would add a policy (Policy CO 4.13) to the General Plan Air Quality Section of the Conservation Element specifically calling for the reduction of greenhouse gas emissions. Policy CO 4.13 is proposed as follows:

CO 4.13 Reduce greenhouse gas (GHG) emissions within the County boundaries.

1. Emission Inventories. The County will prepare GHG emissions inventories produced by:
(1) the County's operational activities, services, and facilities, over which the County has direct responsibility and control; and (2) private industry and development that is located within the area subject to the County's discretionary land use authority, including:
 - a) An inventory of current GHG emissions based on year 2007 conditions;
 - b) A projected inventory for year 2020.
2. GHG Emissions Reduction Plan. The County will adopt a GHG Emissions Reduction Plan (GHG Plan) that includes:
 - a) A year 2020 target for reduction of those sources of GHG emissions attributable to the County's internal government operations and discretionary land use decisions;
 - b) GHG emission reduction measures to ensure that the County meets its reduction target; and
 - c) Implementation and monitoring procedures to provide periodic review of the GHG Plan's progress and allow for adjustments over time to ensure fulfillment of the plan's objectives.

2.4.2 GHG REDUCTION PLAN

The proposed Project includes the proposed adoption of a GHG Emissions Reduction Plan to implement the proposed General Plan policies set forth above. In August 2007, the San Bernardino County Board of Supervisors launched Green County San Bernardino to spur the use of "green" technologies and "green" building practices among residents, business owners, and developers in the county. By supporting green building practices, renewable energy, resource conservation, and other efforts to safeguard the environment, the Board of Supervisors set the course for sustainability and paved the way for responsible growth in the County of San Bernardino. Recognizing that reducing greenhouse gas (GHG) emissions is an important part of ensuring a sustainable future, the County Board of Supervisors committed to preparing a GHG Plan to provide a framework and strategy for the County's efforts by using energy more efficiently, harnessing renewable energy to power buildings, enhancing access to sustainable transportation modes, and recycling waste. The Board's intent was to encourage investment in the local economy, create new green jobs, and improve the community quality of life. The GHG Plan is provided in **Appendix B** of this Draft SEIR.

The General Plan includes a series of linked documents, including the General Plan text and a series of land use, hazard, circulation, and resource overlay maps, a separately bound Housing Element, the community plans, and the background reports. Additionally, the General Plan lists various implementation tools that are incorporated as separate policies and documents. The GHG Plan will serve as an implementation tool that supports the proposed amendment to the existing General Plan. The General Plan Amendment, proposed as part of this project, will add a policy to the General Plan Air Quality Element specifically calling for the reduction of greenhouse gas emissions. The GHG Plan will implement the General Plan policy that is proposed to be added through the General Plan Amendment process.

The GHG Plan will act as one more implementation tool similar to those described in the General Plan to guide development in the county by focusing on attaining the various goals and policies of the General Plan and all community plans relative to GHG emissions and to achieve the goals outlined above. The reduction measures described in GHG Plan will be consistent with the goals, policies, and programs contained in the General Plan.

The GHG Plan quantifies the GHG equivalent of state, regional, and local reduction policies and efforts. State reduction measures are quantified using the methodology included in the Assembly Bill (AB) 32 Scoping Plan and Technical Appendices (CARB 2008). Regional and local reductions are quantified with the best available methodology from agencies and associations such as the U.S. Environmental Protection Agency (USEPA), California Air Pollution Control Officers Association (CAPCOA), and California Energy Commission (CEC). The GHG reduction potential is clearly and comprehensively documented and is sound.

There are a number of regulatory documents intended to address the environmental effects of climate change through reductions in GHG emissions that have guided the creation of the GHG Plan. The GHG Plan was prepared to be consistent with all of the GHG regulatory provisions. The regulatory provisions include the requirement for the development of statewide and region-wide GHG reduction plans; air district promulgation of GHG impact significance thresholds; California Air Resources Board actions implementing AB 32; Sustainable Communities Strategies under SB 375; and Council on Environmental Quality Guidance under NEPA. Specifically:

1. Executive Order S-3-05 (2005)
2. Assembly Bill 32, The California Climate Solutions Act of 2006
3. Assembly Bill 1493, Automobile CO₂ reduction requirements (introduced 2002)
4. Senate Bill 97, Modification to the Public Resources Code (2007)
5. Senate Bill 375, California's Regional Transportation and Land Use Planning Efforts (2008)
6. Senate Bill 1368, Emissions Performance Standards (2008)
7. California Environmental Quality Act (CEQA) Guidelines Amendments concerning greenhouse gas (GHG) emissions (2010)

The framework of the GHG Plan consists of: (1) an inventory of GHG emissions that identifies and quantifies existing emissions and projected future emissions; (2) a reduction target to reduce existing GHG emissions by 15 percent by 2020; and (3) the goals, objectives, and strategies that have been devised to reduce existing emissions to meet the reduction target. The County's GHG Plan and its reduction target are consistent with AB 32 and the California Air Resources

2.0 PROJECT DESCRIPTION

Board (CARB) recommendations to ensure that California emissions are reduced. CARB states, "... ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target." For the purpose of defining "existing" emission levels, the County chose the emissions in the year 2007 as a benchmark for existing emissions conditions.

GHG Emission Inventory

Two separate emission inventories were prepared for the County's GHG Plan: an external inventory and an internal inventory. The external inventory includes GHG emissions produced by private industry and development that is located within the area subject to the County's discretionary land use authority and its ministerial building permit authority. The internal inventory includes GHG emissions associated with the County's services and internal operations.

The unit of measure used in the GHG Plan is the metric ton of carbon dioxide (CO₂) equivalent (MTCO_{2e}). MTCO_{2e} is the international unit that combines the differing impacts of all greenhouse gases into a single unit, by multiplying each emitted gas by its global warming potential (GWP). GWP is the measure of how much a given mass of greenhouse gas contributes to global warming. GWP compares the relative warming effect of the GHG in question to carbon dioxide.

A number of widely accepted protocols for estimating GHG emissions were used to prepare the County's internal and external inventories. The major protocols used in the GHG Plan are described briefly below.

- California Air Resources Board (CARB) Local Governments Operations Protocol (LGOP) (2008). This protocol is the standard for estimating emissions resulting from government buildings and facilities, government fleet vehicles, wastewater treatment and potable water treatment facilities, landfill and composting facilities, and other operations.
- California Climate Action Registry (CCAR) and General Reporting Protocol (2009). This protocol provides guidance for preparing GHG inventories in California.
- CARB California Greenhouse Gas Inventory Data 1990–2006 (2009). CARB's documentation provides background methodology, activity data, protocols, and calculations used for California's statewide inventory.
- California Energy Commission (CEC) Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (2006). This inventory provides useful methodology and emission factors for statewide GHG emissions inventorying.
- U.S. Environmental Protection Agency (USEPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007 (2009). This inventory provides useful methodology and emission factors for nationwide GHG emissions inventorying.
- Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006). This document is the international standard for inventories and provides much of the baseline methodology used in the national and statewide emission inventories.

The external inventory includes a current year inventory and a 2020 year inventory. The year 2007 (referred to as the current year inventory, 2007 inventory, or baseline for the external inventory) was selected as the current year for the external inventory as it was the most recent

year with the necessary data to perform a comprehensive inventory. The 2020 inventory is a projection based on current energy consumption and unit emission rates adjusted by sector-specific growth rates or based on CARB's unmitigated emissions inventory growth rates for 2020 (San Bernardino County, 2011, Chapter 2).

The internal inventory also includes a current year inventory and a 2020 year inventory. Fiscal year July 1, 2006, to June 30, 2007 (referred to as the current year inventory, 2007 inventory, or baseline for the internal inventory) was selected as the current year for the internal inventory because it represents the most recent year with the necessary data to perform a comprehensive inventory (San Bernardino County, 2011, Chapter 2).

The GHG Plan incorporated the approach used by the Local Government Operations Protocol (LGOP), which categorizes local government emission sources as Scope 1 (direct), Scope 2 (indirect), and Scope 3 (other indirect). These emissions types are defined as follows (San Bernardino County, 2011, Chapter 2):

- Scope 1: All direct GHG emissions (with the exception of direct CO₂ emissions from biogenic sources).
- Scope 2: Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.
- Scope 3: All other indirect emissions not covered in Scope 2 that are not under the control or influence of the local government, such as the emissions resulting from the extraction and production of purchased materials and fuels, and transport-related activities in vehicles not owned or controlled by the reporting entity.

The GHG Plan provides sector-specific inventories and analysis to gauge the County's progress toward achieving its aggregated 2020 emissions reduction goal. The following emissions sectors are included in the external inventory. The data source for each emission sector is also included.

- Stationary sources: cement plants, fuel combustion, industrial process emissions, etc.
- Transportation (on-road and off-road)
- Building energy use
 - Industrial: Natural gas and electricity consumption for the industrial sector.
 - Residential: Natural gas and electricity consumption for the residential sector. Data provided by utilities.
 - Commercial: Natural gas and electricity consumption for the commercial sector. Data provided by utilities.
- Solid waste/landfills: methane emissions from landfilled waste
- Agriculture: enteric fermentation and manure management from dairy operations
- Water-related:
 - Wastewater: Fugitive emissions from domestic wastewater treatment.

2.0 PROJECT DESCRIPTION

- Water conveyance: Electricity consumption associated with water importation. Data provided by the CEC [see Appendix A of the GHG Plan (San Bernardino County, 2011)].

The sector-specific current year emissions for the external inventory are shown below in **Table 2-1**, by each major sector. The accounting for projected population and economic growth, unmitigated external emissions in 2020 are also shown in the table. **Table 2-1** shows in order of magnitude that external emissions sources are dominated by stationary sources, followed by on-road transportation, industrial sources, residential energy consumption, commercial energy consumption, landfill waste, off-road transportation, agriculture, wastewater, water conveyance, and miscellaneous emissions from residential fires and cooking (charbroiling emissions).

TABLE 2-1
SAN BERNARDINO COUNTY EXTERNAL EMISSIONS SUMMARY

External Inventory Existing and Unmitigated Emissions Projections (MTCO _{2e})				
Sector	Existing		2020	
	Emissions	Percentage	Emissions	Percentage
Stationary Sources	2,866,435	45.8	3,173,592	41.8
Transportation: On-road	1,631,666	26.1	2,176,132	28.7
Off-road	157,185	2.5	235,054	3.1
Building Energy Use: Industrial	593,716	9.5	760,834	10.0
Residential	440,851	7.1	467,217	6.2
Commercial	246,364	3.9	314,603	4.1
Solid Waste/Landfills	213,191	3.4	359,318	4.7
Agriculture	64,619	1.0	50,991	0.7
Water-Related: Wastewater	27,994	0.4	35,525	0.5
Water Conveyance	10,696	0.2	13,211	0.2
Miscellaneous (residential fires and cooking)	346	0.01	431	0.01
Total	6,253,063	100	7,586,908	100

Source: San Bernardino County, 2011

The GHG Plan shows that cement plants are approximately 95 percent of the stationary source emissions in the county. The cement plant emissions are from several industrial activities, some of which are under the County's jurisdictional control. There are 11 cement plants located in California. Of these plants, four are located in San Bernardino County, three of which are located in the unincorporated area of the county. These three cement plants represent approximately 30 percent of GHG emissions from cement production in California (San Bernardino County, 2011, Chapter 2).

The internal category simply covers those operational activities, services, and facilities over which the County has direct responsibility and control. Examples include County vehicles and equipment, as well as buildings and other County-owned facilities such as airports. External activities are those over which the County has indirect influence or regulatory authority. External sources are essentially private sector development, industry, and business in the unincorporated

portion of San Bernardino County that is subject to the County’s land use authority. The GHG Plan provides different emissions reduction goals, objectives, and strategies for these two. External emissions are further differentiated into six sectors that include building energy use, transportation and land use, solid waste/landfills, stationary sources, agriculture and resource and conservation, and water conservation. The internal emissions are differentiated into County facilities, County fleet, solid waste, employee commute, and water conservation. The use of these sectors allows for application of more discrete reduction strategies.

The following emissions sectors are included in the internal inventory:

- County facilities: natural gas and electricity consumption for County-owned and operated facilities
- Water pumping and wastewater treatment: natural gas and electricity consumption for County-owned and -operated water pumping and treatment facilities
- Outdoor lighting: electricity consumption for County-owned and -operated outdoor lighting
- County vehicle fleet: fuel consumption for County fleets
- Solid waste/landfills: methane emissions from landfilled waste
- Employee commute: fuel consumption for County employees

The data in the current year inventory is based on information gathered from the various County departments, the County General Plan, the Department of Resources Recycling and Recovery [(formerly the California Integrated Waste Management Board (CIWMB)], and the United States Environmental Protection Agency (USEPA), as described below. The 2020 inventory is an unmitigated emissions projection based on current energy consumption and unit emission rates adjusted by sector-specific projected growth rates.

The County’s sector-specific current year and 2020 GHG emissions are presented in **Table 2-2**. The County’s emissions sources are dominated by solid waste, County facilities, County fleet, employee commute, water pumping and wastewater treatment, and outdoor lighting.

**TABLE 2-2
SAN BERNARDINO COUNTY INTERNAL EMISSIONS SUMMARY**

Internal Inventory Existing and 2020 Unmitigated Emissions Projections (MTCO_{2e})				
Sector	Existing		2020	
	Emissions	Percentage	Emissions	Percentage
Solid Waste/Landfills	206,817	60.9	342,480	66.2
County Facilities	62,981	18.5	84,915	16.4
County Vehicle Fleet	34,958	10.3	42,526	8.2
Employee Commute	32,490	9.6	42,869	8.3
Water Pumping and Wastewater Treatment	2,192	0.7	4,114	0.8
Outdoor Lighting	276	0.1	317	0.1
Total	339,714	100	517,221	100

Source: San Bernardino County, 2011

2.0 PROJECT DESCRIPTION

Emissions Reduction Targets

The County's 2020 goal is to decrease both the External and Internal Inventories of emissions to a level at least 15% below Current (2007) year emissions. To achieve this goal, by 2020 the External Inventory emissions will be reduced by approximately 2,272,000 metric tons of CO_{2e} (MTCO_{2e}) (compared to 2020 unmitigated level [7,586,908 MTCO_{2e}]) to a level of approximately 5,315,000 MTCO_{2e}. This constitutes a reduction of approximately 30 percent. The County's goal is also to reduce its 2020 Internal Inventory emissions by approximately 229,000 MTCO_{2e} (compared to 2020 unmitigated level [517,221 MTCO_{2e}]) to a level of 289,000 MTCO_{2e}. This constitutes a total of approximately 42 percent.

Chapter 4.0 of the GHG Plan describes the reduction strategies currently being employed by the County, as well as those that will be employed by the County and the State, many of which are quantifiable. Existing and newly implemented strategies in place through the various County departments will help reduce the countywide GHG emissions level. In addition, proposed new private developments will also contribute to GHG emissions reduction through the County's GHG development review process, AB 32 requirements, and other state initiatives.

External emission reductions are classified into the following six sectors: building energy use (including both energy efficiency and alternative energy), transportation and land use, solid waste/landfills, stationary sources, agriculture and resources conservation, and water conservation. Internal emission reductions are classified into the following four sectors: solid waste/landfills, building energy use, vehicle fleet, and employee commute. For each sector, reduction strategies have been developed that achieve the County's 2020 emissions reduction target. **Table 2-3** is a summary of external reductions by sector, and **Table 2-4** is a summary of internal reduction by sector.

The reduction strategies discussed in the GHG Plan correspond to the reduction measures described in GHG Plan Appendix A for the External Inventory and Appendix B for the Internal Inventory (reduction measures). For purposes of this GHG Plan, the term "reduction strategy" and "reduction measure" have the same meaning. Following the description of each County implemented GHG Plan reduction strategy includes a specific reference to the corresponding reduction measure found in the Appendices. Where the reduction strategy is quantified, the amount of emissions reduction and methodology is set forth in the Appendices.

The reduction strategies are consistent with one or more existing County General Plan policies and programs and/or Development Code requirements. Relevant County General Plan policies are identified under each sector and listed in GHG Plan Appendix C.

**TABLE 2-3
EXTERNAL REDUCTIONS BY SECTOR**

Sector	2020 Reduction (MTCO _{2e})		
	State Strategies	County Strategies	Total
Building Energy – Energy Efficiency and Alternative Energy	335,246	159,452	494,698
Transportation and Land Use	486,157	42,266	528,423
Solid Waste/Landfills	0	206,960	206,960
Stationary Source	1,049,068	0	1,049,068
Agriculture & Resources Conservation	1,531	0	1,531
Water Conservation	2,007	8,186	10,193
Total	1,874,009	416,864	2,290,873

Source: San Bernardino County, 2011

**TABLE 2-4
SUMMARY OF INTERNAL REDUCTIONS BY SECTOR**

Sector	2020 Reduction (MTCO _{2e})		
	State Strategies	County Strategies	Total
Solid Waste/Landfills	0	206,960	206,960
Building Energy Use	15,973	16,899	32,872
Fleet/Fuel	11,179	4,467	15,646
Employee Commute	0	4,651	4,651
Total	27,152	232,977	260,129

Source: San Bernardino County, 2011

Emissions Reduction Measures

The GHG emissions reduction measures identified in the GHG Plan include existing and proposed state, regional, county, and other local measures that would reduce GHG emission in the internal and external categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures, i.e., state, regional, or local, and also whether the measure is quantifiable in terms of calculating a volume of emission reduction. The emissions reduction measures are organized as follows, for each sector:

- Reduction Class 1 (R1) includes adopted, implemented, and proposed state and regional measures that do not require additional County action and that will result in GHG reductions for the County's land use authority area and internal operations. These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.
- Reduction Class 2 (R2) includes all quantifiable measures that have been implemented or will be implemented by the County, as well as any additional quantifiable measures

2.0 PROJECT DESCRIPTION

that require County action and will further reduce the GHG emissions for the County's LUA area and internal operations. R2 also includes any state and regional measures that require substantial action by the County to achieve the expected GHG reductions.

The R2 measures include specific quantifiable measures as well as reductions achieved through the development review process.

Measurable reductions of GHG emissions will be achieved through the County's GHG Development Review Process (DRP) by applying appropriate reduction requirements as part of the discretionary approval of new development projects. Through its development review process, the County will implement CEQA by requiring new development projects to quantify project GHG emissions and adopt feasible mitigation to reduce project emissions below a level of significance.

Mitigation of GHG emissions impacts through the DRP provides one of the most substantial reduction strategies for reducing external emissions. The DRP procedures for evaluating GHG impacts and determining significance for CEQA purposes will be streamlined by (1) applying a uniform set of performance standards to all development projects, and (2) utilizing Screening Tables to mitigate project GHG emissions. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions. A review standard of 3,000 metric tons per years (MTY) will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions. The review standard of 3,000 MTY and the Screening Tables are described in Appendix F.

As part of the implementation of the County GHG Plan, a uniform set of performance standards will be applied to development projects. These performance standards will be added to the County Development Code to ensure consistent application during development review. The complete Development Review Process, including the use of performance standards, for assessing and mitigating GHG emissions is outlined below.

- a) **County Performance Standards.** All development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 MTCO_{2e} per year will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Performance Standards and the methodology relating to the 3,000 MTCO_{2e} per year level.)
- b) **Regulatory Agency Performance Standards.** When, and if, South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.
- c) **Projects Using Screening Table.** For projects exceeding 3,000 MTCO_{2e} per year of GHG emissions, the County will use Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. Projects that garner a 100 or greater points would not require quantification of project specific GHG emissions. The point system was devised to ensure project

compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those from existing development, will allow the County to meet its 2020 target and support longer-term reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Screening Tables and methodology.)

- d) **Projects Not Using Screening Tables.** Projects exceeding 3,000 MTY of GHG emissions that do not use the Screening Tables, will be required to quantify project-specific GHG emissions or otherwise demonstrate that project specific GHG emissions achieve the equivalent level of GHG emissions reduction as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of this alternative GHG mitigation analysis and methodology.)
- e) **Residential Projects Located Outside City Sphere of Influence.** Residential Projects (or mixed use projects with a residential component) in excess of 250 dwelling units that are located in unincorporated area not within a City Sphere of Influence (SOI) will not be eligible to use the Screening Tables or rely on the Plan for a determination of less than significant on individual or cumulative impact for GHG emissions. These projects must perform an independent project-specific evaluation of GHG emissions and present project-specific conclusions regarding significance of GHG emissions impacts. (See Appendix F for a full description of the mitigation analysis and methodology for these projects)
- f) **Projects Requiring EIR.** This process shall not be construed as limiting the County's authority to require an EIR and if needed to adopt a statement of overriding consideration for projects with significant GHG Impacts.

The County will monitor the emissions reductions from new development, calculate those emissions and make any needed modifications to the County's reduction strategies to enable the County to reach its 2020 target.

- Reduction Class 3 (R3) includes additional measures that were not used to demonstrate achievement of the proposed County 2020 GHG emissions reduction target. For these measures, emissions reductions have either not been quantified due to a lack of available data or protocols required for quantification or because of uncertainty regarding the County's jurisdictional control over relevant emissions sources. Some of these measures are quantifiable but require additional refinement and are therefore not included in R1 or R2.

No federal measures were relied upon to achieve the reduction targets included in this plan because of the uncertainty surrounding federal action at this time.

Tables 2-5 through 2-14 summarize the reduction measures proposed in the GHG Plan by sector. GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR. A summary description of these measures is provided at the end of this chapter.

2.0 PROJECT DESCRIPTION

**TABLE 2-5
EXTERNAL GHG EMISSION REDUCTIONS FROM BUILDING ENERGY USE STRATEGIES**

Reduction Classification and Reduction Measure	GHG Reductions	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state and regional building energy measures that do not require County action		
<i>R1E1: Renewable Portfolio Standard – 33 percent by 2020</i>	104,236	7.0
<i>R1E2: AB 1109 Residential Lighting</i>	23,473	1.6
<i>R1E3: AB 1109 Commercial/Outdoor Lighting</i>	14,814	1.0
<i>R1E4: Electricity Energy Efficiency (AB 32)</i>	106,925	7.2
<i>R1E5: Natural Gas Energy Efficiency (AB 32)</i>	9,429	0.6
<i>R1E6: Increased Combined Heat and Power (AB 32)</i>	63,881	4.3
<i>R1E7: Industrial Boiler Efficiency (AB 32)</i>	12,488	0.8
R2: Existing and new building energy measures that require County action		
R2E1: Residential Energy Efficiency Retrofits	17,350	1.2
R2E2: Commercial Energy Efficiency Retrofits	8,540	0.6
R2E3: Residential Renewable Energy Incentives	21,351	1.4
R2E4: Warehouse Renewable Incentive Program	6,786	0.5
R2E5: Solar Hot Water Incentives	11,907	0.8
R2E6: New Residential Energy Efficiency (through DRP)	9,460	0.6
R2E7: New Commercial Energy Efficiency (through DRP)	35,342	2.4
R2E8: New Home Renewable Energy (through DRP)	2,239	0.2
R2E9: New Commercial/Industrial Renewable Energy (through DRP)	25,392	1.7
R2E10: Commercial/Industrial Rehabilitation/Expansion Renewable Energy (through DRP)	21,086	1.4
Total	494,699	33.3
R3: Existing and new building energy measures— reductions not quantified or relied upon to achieve reduction goal		
<i>R3E1: Green Building Development Facilitation and Streamlining</i>		
<i>R3E2: Green Building Training</i>		
<i>R3E3: Community Building Energy Efficiency & Conservation for Existing Buildings</i>		
<i>R3E4: Energy Efficiency Financing</i>		
<i>R3E5: Heat Island Mitigation Plan</i>		
<i>R3E6: Public Education</i>		
<i>R3E7: Cross-Jurisdictional Coordination</i>		

Reduction Classification and Reduction Measure	GHG Reductions	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
<i>R3E8: Community Alternative Energy Development Plan</i>		
<i>R3E9: Support Utility-Scale Renewable Energy Siting and Transmission Lines</i>		
<i>R3E10: Identify and Resolve Potential Barriers to Renewable Energy Deployment</i>		
<i>R3E11: Solar Ready Buildings Promotion</i>		
<i>R3E12: Renewable Energy Financing</i>		
<i>R3E13: Regional Renewable Energy Collaboration</i>		
<i>R3E14: Accessory Wind Energy Systems</i>		
<i>R3E15: Off-Site Mitigation of GHG Impacts for New Development</i>		

Source: San Bernardino County, 2011

Note: GHG reduction measures in italics are those under the County’s jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

**TABLE 2-6
EXTERNAL GHG EMISSION REDUCTIONS FROM LAND USE AND TRANSPORTATION STRATEGIES**

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Transportation Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state and regional transportation measures that do not require County action		
<i>R1T1: California Light-Duty Vehicle GHG Standards: Implement Pavley I Standards</i>	202,569	8.4
<i>R1T2: California Light-Duty Vehicle GHG Standards: Implement Pavley II</i>	29,252	1.2
<i>R1T3: Low Carbon Fuel Standard</i>	161,819	6.7
<i>R1T4: Tire Pressure Program</i>	4,022	0.2
<i>R1T5: Low Rolling Resistance Tires</i>	2,194	0.1
<i>R1T6: Low Friction Engine Oils</i>	20,476	0.8
<i>R1T7: Cool Paints and Reflective Glazing</i>	6,509	0.3
<i>R1T8: Goods Movement Efficiency Measures</i>	37,441	1.6
<i>R1T9: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)</i>	12,514	0.5
<i>R1T10: Medium-and Heavy-Duty Vehicle Hybridization</i>	7,695	0.3
<i>R1T11: Rule 1192—Clean On-Road Transit Buses</i>	835	0.03
<i>R1T12: Rule 1195—Clean On-Road School Buses</i>	831	0.03
R2: Existing and new transportation measures that require County action		
<i>R2T1: Anti-Idling Enforcement Policy</i>	12,076	0.5

2.0 PROJECT DESCRIPTION

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Transportation Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R2T2: Employment Based Trip and VMT Reductions Policy	1,651	0.1
R2T3: Revise Parking Policies	824	0.03
R2T4: Roadway Improvements including Signal Synchronization and Traffic Flow Management	8,230	0.3
R2T5: Expand Renewable Fuel/Low-Emission Vehicle Use	16,295	0.7
R2T6: Ridesharing and Carpooling	798	0.03
R2T7: Bicycle/Pedestrian Infrastructure and Promotion	798	0.03
R2T8: Construct High Occupancy Vehicle (HOV) Lanes	1,594	0.1
Total	528,422	21.9
R3: Existing and new transportation measures— reductions not quantified or relied upon to achieve reduction goal		
<i>R3T1: Public Transit Measures</i>		
<i>R3T2: Leverage Existing Financing Mechanisms and Opportunities</i>		
<i>R3T3: Diesel Exhaust Emissions Control Measures</i>		
<i>R3T4: Regional Land Use/Transportation Coordination</i>		
<i>R3T5: Regional Employment Based Trip Reduction Programs.</i>		
<i>RET6 County Commuter Services Program</i>		
<i>R3T7: Home Employment.</i>		
<i>R3T8: Intelligent Transportation Systems Applications.</i>		
<i>R3T9: Public Outreach and Educational Programs Relative to Various Modes of Transportation.</i>		
<i>R3T109: Land Use Strategies to Reduce Reliance on Automobile Use</i>		

Source: San Bernardino County, 2011

Note: GHG reduction measures in italics are those under the County's jurisdiction to implement and the environmental effects of their implementation are addressed in this Draft SEIR.

**TABLE 2-7
EXTERNAL GHG EMISSION REDUCTIONS FROM WASTE STRATEGIES**

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Waste Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R2: Existing and new measures that require County action		
R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	97,059	27.0
R2W2: Barstow Methane Recovery	37,935 ^a	10.6
R2W3: Landers Methane Recovery	8,471 ^b	2.4
R2W4: Comprehensive Disposal Site Diversion Program	26,390	7.3
R2W5: C&D Recycling Program	295	0.1
R2W6: County Diversion Programs —75 Percent Goal ^c	4,118	1.1
R2W7: City Diversion Programs—75 Percent Goal ^d	32,692	9.1
Total	206,959	57.6
R3: Existing and new waste measures – reductions not quantified or relied upon to achieve reduction goal		
<i>R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP</i>		
<i>R3W2: Leverage Existing Financing Mechanisms and Opportunities</i>		
<i>R3W3: Waste Education Program</i>		
<i>R3W4: Additional Landfill Methane Controls</i>		
<i>R3W5: Landfill Gas to Energy Projects</i>		

Source: San Bernardino County, 2011

Notes:

GHG reduction measures in italics are those under the County’s jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

Reductions for these measures solely represent avoided methane emissions at landfills and assume that all waste reduction measures are implemented in combination.

a. Attributed to waste in place methane reductions from Barstow as well as new waste planned for Barstow.

b. Attributed only to existing waste in place at Landers.

c. Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of County-generated waste by 2020.

d. Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of city-generated waste by 2020.

2.0 PROJECT DESCRIPTION

TABLE 2-8
EXTERNAL GHG EMISSION REDUCTIONS FROM STATIONARY SOURCE STRATEGIES

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Industrial Stationary Source Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state and regional stationary source measures that do not require County action		
<i>R111: Oil and Gas Extraction Combustion Related GHG Emission Reduction</i>	49	0.002
<i>R112: Stationary Internal Combustion Engine electrification</i>	736	0.02
<i>R113: Carbon Intensity Standard for Cement Plants</i>	69,909	2.2
<i>R114: Carbon Intensity Standard for Concrete Batch Plants</i>	732,086	23.1
<i>R115: Waste Reduction in Concrete Use</i>	246,288	7.8
Total	1,049,067	33.1

Source: San Bernardino County, 2011

TABLE 2-9
EXTERNAL EMISSION REDUCTIONS FROM AGRICULTURE AND RESOURCE CONSERVATION STRATEGIES

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Agriculture Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state and regional stationary source measures that do not require County action		
<i>R1A1: Methane Capture at Large Dairies</i>	1,531	3.0
Total	1,531	3.0
R3: Existing and new measures – reductions not quantified or relied upon to achieve reduction goal		
<i>R3NR1: Conservation Areas</i>		
<i>R3NR2: Compensation for Loss of Sequestration</i>		
<i>R3NR3: Urban Forestry</i>		

Source: San Bernardino County, 2011

Note: GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

TABLE 2-10
EXTERNAL GHG EMISSION REDUCTIONS FROM WATER CONSERVATION STRATEGIES

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Water Supply Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state and regional water supply measures that do not require County action		
<i>R1WC1: Renewable Portfolio Standard – 33 percent by 2020</i>	2,007	N/A**
R2: Existing and new water supply measures that require County action		
<i>R2WC1: Per Capita Water Use Reduction</i>	8,186	N/A**
R3: Existing and new water supply measures – reductions not quantified or relied upon to achieve reduction goal		
<i>R3WC1: Manage Storm Water Runoff</i>		
<i>R3WC2: Conservation Areas</i>		
<i>R3WC3: Finance Mechanisms and Opportunities</i>		
Total	10,193	N/A**

Source: San Bernardino County, 2011

Notes:

GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

*Reductions assume measure will effect water importation from the State Water Project only. The County's mandatory influence is only direct for new development; impact on existing development must come through voluntary measures in cooperation with water providers.

**These measures reduces emissions associated with electricity inside and outside the County, as well as from fuel combustion and fugitive emissions from wastewater treatment, thus a strict percent reduction compared to the water emissions is not provided.

2.0 PROJECT DESCRIPTION

**TABLE 2-11
INTERNAL GHG EMISSION REDUCTIONS FROM BUILDING ENERGY USE STRATEGIES**

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated County Facility Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state building energy measures that do not require County action		
<i>R1E1-INT: Renewable Portfolio Standard (33 percent)¹</i>	8,339	9.8
<i>R1E2-INT: AB 1109 Energy Efficiency Standards for Lighting</i>	5,338	6.3
<i>R1E3-INT: Title 24 standards for Non-Res. Buildings</i>	2,296	2.7
R2: Existing and new building energy measures that require County action		
R2E1-INT: LEED Silver for New County Buildings	2,076	2.4
R2E2-INT: Retrofit Existing Buildings	1,427	1.7
R2E3-INT: Increase Use of Combined Heat and Power Systems	3,885	4.6
R2E4-INT: Office Equipment Procurement Standard	2,307	2.7
R2E5-INT: Leasing Procurement Standards	3,084	3.6
R2E6-INT: Install solar and other renewable energy sources on County Buildings	3,639	4.3
R2E7-INT: HVAC Retrofit Program	205	0.2
R2E8-INT: Solar PV Installation Projects	276	0.3
Total	32,873	38.7
R3: Existing and new building energy measures – reductions not quantified or relied upon to achieve reduction goal		
<i>R3E1-INT: Utilize Incentives Offered by Southern California Edison Partnership</i>		
<i>R3E2-INT: Benchmark Existing Buildings</i>		
<i>R3E3-INT: Link Utility Payment/Energy Usage Data into the Computer Aided Facilities Management Database</i>		
<i>R3E4-INT: Train County Employees on Energy Efficiency and Conservation</i>		
<i>R3E5-INT: Apply Energy Saving Design Features</i>		
<i>R3E6-INT: Contracting Practices</i>		
<i>R3E7-INT: Small Tools and Equipment Use</i>		

Source: San Bernardino County, 2011

Notes:

GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

¹ This analysis incorporates the California Air Resources Board's adopted Renewable Portfolio Standard (RPS) goal of 33 percent, set forth in Executive Order S-14-08. This order states that 33 percent of energy used in California will be derived from renewable sources by the year 2020. The 33 percent RPS goal by year 2020 is considered by many to be a very aggressive goal that may not be met since it is possible that many energy providers will not have met the more modest RPS goal of 20 percent by 2010. If the more modest 20 percent RPS goal is used for this analysis, anticipated GHG emission reductions associated with this measure are 3,087 MTCO_{2e} in 2020.

TABLE 2-12
INTERNAL GHG EMISSION REDUCTIONS FROM VEHICLE/FUELS STRATEGIES

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated County Fleet Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state and regional transportation measures that do not require County action		
<i>R1F1-INT: Assembly Bill 1493 (Pavley I) California Light-Duty Vehicle GHG Standards</i>	5,328	12.5
<i>R1F2-INT: Assembly Bill 1493 (Pavley II) California Light-Duty Vehicle GHG Standards</i>	2,946	6.9
<i>R1F3-INT: Executive Order S-1-07 (Low Carbon Fuel Standard)</i>	769	1.8
<i>R1F4-INT: Tire Pressure Program</i>	106	0.2
<i>R1F5-INT: Low Rolling Resistance Tires</i>	31	0.1
<i>R1F6-INT: Low Friction Engine Oils</i>	539	1.3
<i>R1F7-INT: Cool Paints and Reflective Glazing</i>	171	0.4
<i>R1F8-INT: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)</i>	153	0.4
<i>R1F9-INT: Medium- and Heavy-Duty Vehicle Hybridization</i>	82	0.2
<i>R1F10-INT: Rule 1191—Clean On-Road Light- and Medium-Duty Public Fleet Vehicles</i>	80	0.2
<i>R1F11-INT: Rule 1193—Clean On-Road Residential and Commercial Refuse Collection Vehicles</i>	856	2.0
<i>R1F12-INT: Rule 1196—Clean On-Road Heavy-Duty Public Fleet Vehicles</i>	118	0.3
R2: Existing and new vehicle fleet measures that require County action		
<i>R2F1a-INT: Current fleet turnover</i>	1,831	4.3
<i>R2F1b-INT: Replace All Passenger/Light-Duty Vehicles by 2020</i>	2,600	6.1
<i>R2F2-INT: Replace All Medium and Heavy-Duty Vehicles by 2020</i>	36	0.1
Total	15,647	37
R3: Existing and new vehicle fleet measures— reductions not quantified or relied upon to achieve reduction goal		
<i>R3F1-INT: Implement Accelerated Vehicle Fleet Turnover for "Other" Vehicles</i>		
<i>R3F2-INT: Use Hybrid/ULEV Vehicles</i>		
<i>R3F3-INT: Implement Early Tire Inflation Program</i>		
<i>R3F4-INT: Implement Anti-Idling Measures</i>		
<i>R3F5-INT: Implement Smart Driving Policy</i>		
<i>R3F6-INT: Implement Vehicle Maintenance Program</i>		

2.0 PROJECT DESCRIPTION

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated County Fleet Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
<i>R3F7-INT: Senate Bill 375, Statutes 2008</i>		
<i>R3F8-INT: California's Low-Emission Vehicle (LEV) Regulations</i>		
<i>R3F9-INT: Zero Emission Vehicle (LEV) Regulations</i>		
<i>R3F10-INT: Fleet and Equipment Management and Monitoring</i>		

Source: San Bernardino County, 2011

Note: GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

TABLE 2-13
INTERNAL GHG EMISSION REDUCTIONS FROM WASTE STRATEGIES

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Waste Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R2: Existing and new measures that require County action		
R2W1-INT: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	97,059	28.3
R2W2-INT: Barstow Methane Recovery	37,935 ^a	11.1
R2W3-INT: Landers Methane Recovery	8,471 ^b	2.5
R2W4-INT: Comprehensive Disposal Site Diversion Program	26,390	7.7
R2W5-INT: C&D Recycling Program	295	0.1
R2W6-INT: County Diversion Programs—75 Percent Goal ^c	4,118	1.2
R2W7-INT: City Diversion Programs—75 Percent Goal ^d	32,692	9.5
Total	206,959	60.4
R3: Existing and new waste measures— reductions not quantified or relied upon to achieve reduction goal		
<i>R3W1-INT: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP</i>		
<i>R3W2-INT: Leverage Existing Financing Mechanisms and Opportunities</i>		
<i>R3W3-INT: Waste Education Program</i>		
<i>R3W4-INT: Additional Landfill Methane Controls</i>		
<i>R3W5-INT: Landfill Gas to Energy Projects</i>		

Source: San Bernardino County, 2011

Notes:

GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

Reductions for these measures solely represent avoided methane emissions at landfills and assume that all waste reduction measures are implemented in combination.

a. Attributed to waste in place methane reductions from Barstow as well as new waste planned for Barstow.

b. Attributed only to existing waste in place at Landers.

c. Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of County-generated waste by 2020.

d. Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of city-generated waste by 2020.

TABLE 2-14
INTERNAL GHG EMISSION REDUCTIONS FROM EMPLOYEE COMMUTE STRATEGIES

Reduction Classification and Reduction Measure	GHG Reductions from 2020 Unmitigated Employee Commute Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated Levels	Percentage Reduction from 2020 Unmitigated Levels
R1: Existing and proposed state employee commute measures that do not require County action		
N/A		
R2: Existing and new employee commute measures that require County action		
R2EC1-INT: Expand Vanpool Program	2,201	5.1
R2EC2-INT: Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving	860	2.0
R2EC3-INT: Increase Bicycling and Walking	753	1.8
R2EC4-INT: Increase the Use of Public Transit as an Alternative to Driving	138	0.3
R2EC5-INT: Increase Use of Clean Air Vehicles	699	1.6
Total	4,651	10.8
R3: Existing and new employee commute measures-reductions not quantified or relied upon to achieve reduction goal		
<i>R3EC1-INT: Telecommuting, Compressed Work Week</i>		

Source: San Bernardino County, 2011

Note: GHG reduction measures in italics are those under the County's jurisdiction to implement, and the environmental effects of their implementation are addressed in this Draft SEIR.

Summary Description of GHG Emission Reduction Measures

The following is a summary description of the various emission reduction measures included in the GHG Plan. For more detailed discussion of these measures, please refer to the GHG Plan Chapter 4 and Appendices A and B.

External GHG Emission Reduction Measures

Building Energy Measures

R1: State and regional building energy measures

R1E1: Renewable Portfolio Standard (RPS) – 33 percent by 2020: RPS requiring all energy providers in the State to generate 33 percent of all energy through renewable energy resources by 2020.

R1E2: AB 1109 Residential Lighting: Energy efficiency standards requiring at least 50 percent reduction from 2007 levels for indoor residential lighting by 2018.

R1E3: AB 1109 Commercial/Outdoor Lighting: Energy efficiency standards requiring at least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

2.0 PROJECT DESCRIPTION

R1E4: Electricity Energy Efficiency (AB 32): Energy Efficiency activities included in CARB's AB 32 Scoping Plan.

R1E5: Natural Gas Energy Efficiency (AB 32): Title 24 Energy Efficiency Standards updates, local government green building ordinances, and energy efficiency retrofits.

R1E6: Increased Combined Heat and Power (AB 32): Combined heat and power system operation to capture "waste heat" produced during power generation for local use.

R1E7: Industrial Boiler Efficiency (AB 32): Increased energy efficiency for industrial boilers.

R2: County Building Energy measures (Quantified)

R2E1: Residential Energy Efficiency Retrofit: Program for energy efficient retrofits to existing dwellings including energy efficiency improvements to HVAC systems, water heating systems, windows and insulation.

R2E2: Commercial Energy Efficiency Retrofits: County program for commercial energy efficient retrofits, including energy efficiency improvements to HVAC systems, water heating systems, windows and insulation.

R2E3: Residential Renewable Energy Incentives: Installation of solar photovoltaic panels during a retrofit or major renovation of residential dwellings.

R2E4: Warehouse Renewable Energy Incentive Program: Incentive program for installation of solar photovoltaic panels on new warehouse development projects.

R2E5: Solar Hot Water Incentives: Participation in the California Solar Initiative (CSI) Thermal Program to provide incentives for the installation of solar water heating systems in new and existing homes and businesses.

R2E6: New Residential Energy Efficiency: Mitigation of GHG emissions through the County's Development Review Process (DRP) with the incorporation of energy efficient features in new residential construction.

R2E7: New Commercial Energy Efficiency: Mitigation of GHG emissions through the County's DRP with incorporation of energy efficient features in new commercial construction.

R2E8: New Home Renewable Energy: Mitigation of GHG emissions through the County's DRP with the installation of solar panels in new residential construction.

R2E9: New Commercial/Industrial Renewable Energy: Mitigation of GHG emissions through the County's DRP with solar (or other renewable) energy measures incorporated into new construction of commercial, office, or industrial development.

R2E10: Commercial/Industrial Rehabilitation/Expansion Renewable Energy: Installation of solar (or other renewable) energy in commercial and industrial projects requiring discretionary permits for major rehabilitations or expansions of commercial, office, or industrial development.

R3: County Building Energy measures (Not Quantified)

R3E1: Green Building Development Facilitation and Streamlining: Incentives provided through the County's Green County Program and removal of regulatory or procedural barriers to implementing green building practices in the County, such as updating codes, guidelines, and zoning.

R3E2: Green Building Training: Providing green building information, marketing, training, and technical assistance to property owners, development professionals, schools, and special districts.

R3E3: Community Building Energy Efficiency & Conservation for Existing Buildings: Energy conservation campaign to promote energy conservation in community.

R3E4: Energy Efficiency Financing: Funding for energy efficiency projects for existing and new development including heating, air conditioning, lighting, water heating equipment, insulation and weatherization.

R3E5: Heat Island Mitigation Plan: Development of a "heat island" mitigation plan, including guidelines for cool roofs, cool pavements, and strategically placed shade trees.

R3E6: Public Education: Public education concerning energy efficiency and incentives programs.

R3E7: Cross-Jurisdictional Coordination: Coordination with other local governments, special districts, nonprofits, and other public organizations to share resources and achieve economies of scale.

R3E8: Community Alternative Energy Development Plan: Partnership with Southern California Edison to explore developing an alternative energy plan for existing development, including identification of allowable and appropriate alternative energy facility types.

R3E9: Support Utility-Scale Renewable Energy Siting and Transmission Lines: Identification of possible sites for production of renewable energy such as solar, wind, small hydro, and, biogas.

R3E10: Identify and Resolve Potential Barriers to Renewable Energy Deployment: Identification and removal of regulatory barriers, to producing renewable energy, in development code and other regulations.

R3E11: Solar Ready Buildings Promotion: New building construction to allow for the easy, cost-effective installation of future solar energy systems (where feasible).

R3E12: Renewable Energy Financing: Availability of low-interest financing for residential and commercial renewable energy.

R3E13: Regional Renewable Energy Collaboration: Collaboration with local governments, special districts, nonprofits, and other public organizations to share resources, achieve economies of scale, and develop renewable energy policies and programs that are optimized on a regional scale.

2.0 PROJECT DESCRIPTION

R3E14: Accessory Wind Energy Systems: Facilitation of wind energy systems through County ordinance.

R3E15: Off-Site Mitigation of GHG Impacts for New Development: Development of policy and/or guidelines for off-site mitigation of GHG impacts from new development projects.

Transportation and Land Use Measures

R1: State and regional Transportation and Land Use measures

R1T1: California Light-Duty Vehicle GHG Standards/ Implement Pavley I Standards: Regulations to reduce GHG emissions from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016.

R1T2: California Light-Duty Vehicle GHG Standards/ Implement Pavley II: Standards beginning in 2017 to obtain a 45 percent GHG reduction from 2020 model year vehicles.

R1T3: Low Carbon Fuel Standard: Regulations which require a reduction of at least ten (10) percent in the carbon intensity of California's transportation fuels by 2020.

R1T4: Tire Pressure Program: Regulations increasing vehicle efficiency by assuring that vehicle tire pressure is maintained to manufacturer specifications.

R1T5: Low Rolling Resistance Tires: Regulations increasing vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance.

R1T6: Low Friction Engine Oils: Requiring use of engine oils that meet certain low friction specifications.

R1T7: Cool Paints and Reflective Glazing: Requiring reduced engine load for cooling the passenger compartment with air conditioning through the use of solar reflective paint and window glazing.

R1T8: Goods Movement Efficiency Measures: System wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion.

R1T9: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency): Regulations increasing heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of technology to reduce aerodynamic drag and rolling resistance.

R1T10: Medium-and Heavy-Duty Vehicle Hybridization: Program to reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids.

R1T11: Rule 1192—Clean On-Road Transit Buses: Requirement to public transit fleets operating in the South Coast Air Quality Management District's (SCAQMD's) jurisdiction to acquire alternative-fuel heavy-duty vehicles when procuring these vehicles.

R1T12: Rule 1195—Clean On-Road School Buses: Public and private school bus fleet operators in the SCAQMD's jurisdiction to acquire alternative-fuel school buses or retrofit used or existing school buses.

R2: County Transportation and Land Use measures (Quantified)

R2T1: Anti-Idling Enforcement Policy: Enforcement of the County's anti-idling ordinance.

R2T2: Employment Based Trip and VMT Reductions Policy: Creating commuter-choice programs, employer transportation management, guaranteed ride-home programs, and commuter assistance and outreach.

R2T3: Revise Parking Policies: Implementation of a comprehensive parking policy for public and private parking lots throughout the County that encourages carpooling and the use of alternative transportation.

R2T4: Roadway Improvements including Signal Synchronization and Traffic Flow Management: Modification of arterial roadways to allow more-efficient bus operation, including possible signal preemption, expanding signal-timing programs.

R2T5: Expand Renewable Fuel/Low-Emission Vehicle Use: Collaboration with local and regional governments and businesses to support expanded use of renewable fuels.

R2T6: Increase Use of Ridesharing and Carpooling: Increasing ridesharing with funding programs and rideshare incentives.

R2T7: Bicycle/Pedestrian Infrastructure and Promotion: Increased bicycle/pedestrian facilities in new development projects.

R2T8: Support High Occupancy Vehicle (HOV) Lanes: Regional construction of HOV lanes on arterial roadways to encourage carpooling and alternative forms of transportation for commuting.

R3: County Transportation and Land Use measures (Not quantified)

R3T1: Public Transit Strategies: Incorporation of local and regional transit measures into project design of new development.

R3T2: Leverage Existing Financing Mechanisms and Opportunities: Pursuant of financing mechanisms and opportunities.

R3T3: Diesel Exhaust Emissions Control Measures: Continued implementation of the County's diesel exhaust ordinance.

R3T4: Regional Land Use/Transportation Coordination: Coordination with Cities, San Bernardino Associated Governments (SANBAG), Southern California Association of Governments (SCAG) and transit providers to promote mixed use, transit linkages and transit-oriented development in unincorporated portions of the County pursuant to SB 375.

R3T5: Regional Employment Based Trip Reduction Programs. Continued support of trip reduction programs developed by SANBAG.

R3T6: County Commuter Services Program. Continued operation of a Commuter Services Program.

2.0 PROJECT DESCRIPTION

R3T7: Home Employment: Facilitation of employment opportunities through the County's Home Occupations Ordinance.

R3T8: Intelligent Transportation Systems Applications. Utilization of Intelligent Transportation Systems to increase efficiency, safety and ability to relieve congestion.

R3T9: Public Outreach and Educational Programs. Community outreach and public education relating to bicycle safety and opportunities for public transit and ridesharing.

R3T10: Land Use Strategies to Reduce Reliance on Automobile Use: Land-use strategies consistent with the County's General Plan, to increase non-automotive transportation.

Solid Waste/Landfill Measures

R2: County Solid Waste/Landfill Measures (Quantified)

R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills: A methane recovery rate of 95 percent at Mid-Valley landfill and 85 percent at Colton and Milliken Landfills.

R2W2: Barstow Methane Recovery: Installation a methane recovery system at Barstow Landfill.

R2W3: Landers Methane Recovery: Installation a methane recovery system at Landers Landfill.

R2W4: Comprehensive Disposal Site Diversion Program: Continued implementation of the County's CDSDP which diverts waste sent to landfills.

R2W5: C&D Recycling Program: Diversion of construction materials and demolition debris from landfills.

R2W6: County Diversion Programs -75 Percent Goal: Diversion of solid waste disposal within the unincorporated County through various waste reduction measures.

R2W7: City Diversion Programs -75 Percent Goal: Cities diversion of solid waste disposal through various waste reduction measures.

R3: County Solid Waste/Landfill measures (Not Quantified)

R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP: Installation of methane recovery system at all landfills with 250,000 or more tons of waste in place.

R3W2: Financing Mechanisms and Opportunities: Pursuit of financing mechanisms and opportunities including State and Federal Grants, Low-interest Loans, and Self-Funding and Revolving Fund Programs.

R3W3: Waste Education Program: Providing public education and information about commercial and residential recycling, waste reduction, composting, grass cycling, and waste prevention.

R3W4: Additional Landfill Methane Controls: Installation of additional methane capture systems and waste disposal alternatives at County-owned landfills.

R3W5: Landfill Gas to Energy Projects : Pursuing additional LFGE projects at landfills where the projects are cost-effective and technologically feasible.

Stationary Source Measures

R1: State and regional Stationary Source measures

R111: Oil and Gas Extraction Combustion Related GHG Emission Reduction: Increased oil and gas extraction efficiency by replacing or retrofitting industrial boilers and steam generators with more efficient ones, and by replacing internal combustion engines with electric ones.

R112: Stationary Internal Combustion Engine electrification: Commercial and industrial engines over 50 horsepower used as primary power sources, replaced with internal combustion engines with electric motors.

R113: Carbon Intensity Standard for Cement Plants: Requirement of a carbon intensity standard (CIF) of 0.8 metric ton CO₂ per metric ton of cement used in California.

R114: Carbon Intensity Standard for Concrete Batch Plants: Requirement of a CIF of 0.6 metric ton CO₂ per metric ton of cement used in California.

R115: Waste Reduction in Concrete Use: Setting minimum waste requirement or establishing emissions fees on unused returned concrete.

Agriculture and Resource Conservation Measures

R1: State and regional Agricultural and Resource Conservation measures

R1A1: Methane Capture at Large Dairies: Encourages voluntary installation of methane digesters to capture methane emissions at large dairies.

R3: County Agriculture and Resource Conservation measures (Not quantified)

R3NR1: Conservation Areas: Preservation of existing land conservation areas (especially forested areas, oak woodlands, and wetlands) that provide carbon sink benefits.

R3NR2: Compensation for Loss of Sequestration: Project-level compensation for loss of sequestration through requirements for on-site and off-site tree planting and/or funding for restoration of forested areas, woodlands, and wetlands.

R3NR3: Urban Forestry: Evaluation of the feasibility of substantially expanding tree planting in the County.

Water Conservation Measures

R1: State and regional Water Conservation measures

2.0 PROJECT DESCRIPTION

R1WC1: RPS re: Water Supply & Conveyance: Reduction of emissions association with water conveyance and supply.

R2: County Water Conservation measures (Quantified)

R2WC1: Per Capita Water Use Reduction Goal Policy: Reduction of water use through: the County's Water Efficient Landscape Ordinance; Water Conservation Ordinance (No. SD 90-11); new development requirements, water efficiency, retrofits, education, supply improvements, and recycled water use.

R3: County Water Conservation measures (Not quantified)

R3WC1: Manage Storm Water Runoff: Low-impact development practices that maintain the existing hydrologic character of the site to manage storm water

R3WC2: Conservation Areas: Preservation of existing land conservation areas for watershed protection to protect water quality (reduces water treatment energy use)

R3WC3: Financing Mechanisms and Opportunities: Pursuing financing mechanisms and opportunities including State and Federal Grants

Internal GHG Emission Reduction Measures

Building/Energy Measures

R1: State Building/Energy measures

R1E1-INT: Renewable Portfolio Standard (RPS) - 33 percent by 2020: Establishment of a RPS requiring all energy providers in the State to generate 33 percent of all energy through renewable energy resources by 2020.

R1E2-INT: AB 1109 Energy Efficiency Standards for Lighting: Energy efficiency standards to require at least 50 percent reduction from 2007 levels for indoor residential lighting and at least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

R1E3-INT: Title 24 standards for Non-Res. Buildings: Increased non-residential building energy efficiency, including Title 24 Energy Efficiency Standards updates, local government green building ordinances, and energy efficiency retrofits.

R2: County Building/Energy measures (Quantified)

R2E1-INT: LEED Silver for New County Buildings: New County buildings will be required to meet a minimum level of efficiency to satisfy LEED Silver requirements.

R2E2-INT: Retrofit Existing Buildings : Retrofit of 25 percent of the County-owned buildings that existed in 2007, by 2020

R2E3-INT: Increase use of combined heat and power systems: Installation of combined heat and power (CHP) systems on a portion of County-owned buildings.

R2E4-INT: Office Equipment Procurement Standard: Office equipment replacement with ENERGY STAR rated office equipment.

R2E5-INT: Leasing Procurement Standards: Buildings leased by the County will have at least 20 percent lower energy intensity than those leased in 2007.

R2E6-INT: Install solar and other renewable energy sources on County Buildings: Installation of renewable energy sources (such as solar photovoltaic panels, geothermal or small-scale wind power) on a portion of County-owned buildings.

R2E7-INT: HVAC Retrofit Program: Heating, Ventilation and Air Conditioning (HVAC) retrofit program to install variable frequency drives (VFD), economizers, and controls to various mechanical systems on a portion of the County's buildings.

R2E8-INT: Solar PV Installation Projects: Installation of solar photovoltaic panels on two specific County-owned buildings

R3: County Building/Energy measures (Not Quantified)

R3E1-INT: Utilize Incentives Offered by Southern California Edison Partnership: Collaborating with SCE to take advantage of SCE partnership rebates.

R3E2-INT: Benchmark Existing Buildings: Using ENERGY STAR Portfolio Manager to benchmark all County-owned buildings.

R3E3-INT: Link Utility Payment/Energy Usage Data into the Computer Aided Facilities Management Database: Linking databases to enhance the County's energy usage data tracking and facilitate energy analysis on all County buildings.

R3E4-INT: Train County Employees on Energy Efficiency and Conservation: Institutionalizing energy efficiency and conservation practices through the training of County employees.

R3E5-INT: Apply Energy Saving Design Features: Energy-saving building design features on County-owned buildings such as building orientation, external shading, enhanced insulation, energy recovery ventilation, heat exchangers, and centralized heating and cooling.

R3E6-INT: Contracting Practices: Establishment of contracting practices that encourage GHG emissions reduction, such as preference for recycled materials, low emissions equipment and green management practices.

R3E7-INT: Small Tools and Equipment Use: Installation of outdoor electrical outlets on buildings to support the use of electric lawn and garden equipment.

Fleet/Fuel Measures

R1: State and regional Fleet/Fuel measures

R1F1-INT: Assembly Bill 1493 (Pavley I) California Light-Duty Vehicle GHG Standards: Regulations to reduce GHG emissions from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016.

2.0 PROJECT DESCRIPTION

R1F2-INT: Assembly Bill 1493 (Pavley II) California Light-Duty Vehicle GHG Standards: Standards beginning in 2017 to obtain a 45 percent GHG reduction from 2020 model year vehicles.

R1F3-INT: Executive Order S-1-07 (Low Carbon Fuel Standard): Regulations which require a reduction of at least ten (10) percent in the carbon intensity of California's transportation fuels by 2020.

R1F4-INT: Tire Pressure Program: Regulations increasing vehicle efficiency by assuring that vehicle tire pressure is maintained to manufacturer specifications.

R1F5-INT: Low Rolling Resistance Tires: Regulations increasing vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance.

R1F6-INT: Low Friction Engine Oils: Requiring use of engine oils that meet certain low friction specifications.

R1F7-INT: Cool Paints and Reflective Glazing: Requiring reduced engine load for cooling the passenger compartment with air conditioning through the use of solar reflective paint and window glazing.

R1F8-INT: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency): Installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance.

R1F9-INT: Medium- and Heavy-Duty Vehicle Hybridization: Program to reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids.

R1F10-INT: Rule 1191 - Clean On-Road Light- and Medium-Duty Public Fleet Vehicles: Requirement of public fleets in the SCAQMD's jurisdiction that are operating passenger car, light-duty truck, or medium-duty vehicle fleets to acquire low-emitting gasoline or alternative-fuel vehicles when procuring new vehicles of these types.

R1F11-INT: Rule 1193 - Clean On-Road Residential and Commercial Refuse Collection Vehicles: Requires public and private solid waste collection fleet operators to acquire alternative-fuel refuse collection heavy-duty vehicles when procuring these vehicles for use within the SCAQMD's jurisdiction.

R1F12-INT: Rule 1196 - Clean On-Road Heavy-Duty Public Fleet Vehicles: Requires public fleets in the SCAQMD's jurisdiction operating heavy-duty vehicle fleets to acquire alternative-fuel, dual-fuel, or dedicated gasoline heavy-duty vehicles when procuring or leasing these vehicles for use within the SCAQMD's jurisdiction.

R2: County Fleet/Fuel measures (Quantified)

R2F1-INT: Implement Accelerated Turnover of Passenger/Light Duty Vehicles: Replacement of County-owned passenger/light-duty vehicles with the most efficient vehicles available where practicable by the year 2020.

R2F2-INT: Replace All Medium and Heavy-Duty Vehicles by 2020: Replacement of County-owned medium-duty and heavy-duty vehicles (excluding fire department vehicles) with the most efficient vehicles available where practicable by 2020.

R3: County Fleet/Fuel measures (Not quantified)

R3F1-INT: Implement Accelerated Vehicle Fleet Turnover for "Other" Vehicles: Replacement of County-owned vehicles classified as "other," (including off-road vehicles, construction equipment, marine vehicles, and stationary engines) with cleaner-burning diesel engines or alternative fueled engines, when feasible.

R3F2-INT: Use Hybrid/ULEV Vehicles: Replacement of retired vehicles with hybrid electric vehicles and/or ULEV that are 50 percent cleaner than average new model cars, when feasible.

R3F3-INT: Implement Early Tire Inflation Program: Implementation of CARB's Tire Inflation Program to ensure vehicle tire pressure is maintained to manufacturer's specifications.

R3F4-INT: Implement Anti-Idling Measures: Implementation of CARB's Anti-Idling Enforcement.

R3F5-INT: Implement Smart Driving Policy: Implementation of a Smart Driving Policy to reduce fuel consumption.

R3F6-INT: Implement Vehicle Maintenance Program: Implementation of a vehicle maintenance program to reduce fuel consumption.

R3F7-INT: Senate Bill 375, Statutes 2008: Coordination with Cities, San Bernardino Associated Governments (SANBAG), Southern California Association of Governments (SCAG) and transit providers to promote mixed use, transit linkages and transit-oriented development in unincorporated portions of the County pursuant to SB 375.

R3F8-INT: California's Low-Emission Vehicle (LEV) Regulations: State's adoption of the California's Low-Emission Vehicle (LEV II) regulations.

R3F9-INT: Zero Emission Vehicle (LEV) Regulations: State's ZEV program relating to the development of clean vehicles and supports the vision needed to meet California's longer-term environmental goals.

R3F10-INT: Fleet and Equipment Management and Monitoring: Implementation of fleet and equipment management and monitoring that include: "right sizing" the fleet and installation of GPS.

Solid Waste/Landfill Measures

R2: County Solid Waste/Landfill measures (Quantified)

R2W1-INT: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills: A methane recovery rate of 95 percent at Mid-Valley landfill and 85 percent at Colton and Milliken Landfills.

2.0 PROJECT DESCRIPTION

R2W2-INT: Barstow Methane Recovery: Installation a methane recovery system at Barstow Landfill.

R2W3-INT: Landers Methane Recovery: Installation a methane recovery system at Landers Landfill.

R2W4-INT: Comprehensive Disposal Site Diversion Program: Continued implementation of the County's CDSDP which diverts waste sent to landfills.

R2W5-INT: C&D Recycling Program: Diversion of construction materials and demolition debris from landfills.

R2W6-INT: County Diversion Programs - 75 Percent Goal: Diversion of solid waste disposal within the unincorporated County through various waste reduction measures.

R2W7-INT: City Diversion Programs—75 Percent Goal: Cities diversion of solid waste disposal through various waste reduction measures.

R3: County Solid Waste/Landfill measures (Not Quantified)

R3W1-INT: Installation of Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP: Installation of methane recovery system at all landfills with 250,000 or more tons of waste in place.

R3W2-INT: Financing Mechanisms and Opportunities: Pursuit of financing mechanisms and opportunities including State and Federal Grants, Low-interest Loans, and Self-Funding and Revolving Fund Programs.

R3W3-INT: Waste Education Program: Providing public education and information about commercial and residential recycling, waste reduction, composting, grass cycling, and waste prevention.

R3W4-INT: Additional Landfill Methane Controls: Installation of additional methane capture systems and waste disposal alternatives at County-owned landfills.

R3W5-INT: Landfill Gas to Energy Projects: Additional LFGE projects at landfills where feasible.

Employee Commute Measures

R2: County Employee Commute measures (Quantified)

R2EC1-INT: Expand Vanpool Program: Strengthening and expanding current vanpool programs with additional vanpools, expanding the number of work sites where the vanpools operate.

R2EC2-INT: Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving: Strengthening rideshare and carpool programs with carpool awards, educational seminars, commuter-choice programs, guaranteed ride-home programs, commuter assistance and outreach, and parking incentives.

R2EC3-INT: Increase Bicycling and Walking: Strengthening walking and bicycling incentives.

R2EC4-INT: Increase the Use of Public Transit as an Alternative to Driving: Strengthening public transit incentives.

R2EC5-INT: Increase Use of Clean Air Vehicles: Implementation of commuter assistance, outreach, and educational programs focused on encouraging employees to purchase hybrids and alternative fueled vehicles.

R3: County Employee Commute measures (Not Quantified)

R3EC1-INT: Telecommuting, Compressed Work Week: Proving options for telecommuting, compressed work weeks and off-peak work hours, when appropriate.

Carbon Sequestration Measures

R3: County Carbon Sequestration measures (Not Quantified)

R3CS1-INT: Tree Management: Maintaining and increasing the County's tree inventory.

R3CS2-INT: Landscaping: Replacing existing landscaping vegetation with drought-tolerant, low maintenance native species and converting impervious surfaces to landscaping.

2.4.3 DEVELOPMENT CODE AMENDMENT

The project to be considered in the Draft SEIR will also include an amendment to the Development Code codifying the process for evaluating GHG emissions reduction as part of the development review process for new development projects. Chapter 85.03 of Division 5, Permit Application and Review Procedure of the Development Code (specifically Section 85.03.040) is proposed to be amended to include the following language:

- (a) **Applications subject to CEQA.** All land use applications that are subject to the California Environmental Quality Act (CEQA) shall be reviewed by the Department in compliance with the County Environmental Review Guidelines.
- (b) **Environmental findings required.** Before taking an action to approve a land use application that is subject to CEQA, the Planning Agency shall make one or more environmental findings. The environmental finding(s) is required in addition to the findings specified in this Development Code for each application type.
- (c) **Greenhouse Gas (GHG) Emissions Review.** All land use applications that are subject to CEQA review shall have the potential impacts of the project's GHG emissions evaluated pursuant to the procedures entitled Review of GHG Emissions, Land Use Service Department Standard Policy/Procedures Manual, Section 9 (Environmental Review Guidelines). [proposed amendment in underlined text]

In addition, the Development Code will be amended in Chapter 84.29 and 84.30 of Division 4, Standards for Specific Land Uses and Activities, to incorporate the mitigation measures identified in this SEIR and GHG Performance Standards, respectively. Chapter 84.29 will incorporate additional mitigation measures, as revised in the FSEIR, as specific standards for various renewal energy generating facilities. Chapter 84.30 is being added as a new chapter of standards for GHG emissions reductions.

2.5 REGULATORY REQUIREMENTS, PERMITS, AND APPROVALS

Concurrent with the adoption of the General Plan Amendment and the GHG Plan, the County will amend its General Plan to incorporate the above identified policy to reflect the County's

2.0 PROJECT DESCRIPTION

intent to reduce GHG emissions that are reasonably attributable to the County's discretionary land use decisions and the County's internal governmental operations. The project to be considered in the Draft SEIR also includes an amendment to the Development Code implementing GHG emissions reduction measures, as part of the development review process for new development projects.

Adoption of the General Plan Amendment and the associated GHG Plan and Development Code amendments does not require action by any other agencies.

2.6 APPLICATION OF THE GHG PLAN TO FUTURE CEQA REVIEWS AND SPECIFIC PROJECTS

One of the objectives of the proposed Project is to adopt a GHG Plan that satisfies the requirements of Section 15183.5 of the CEQA Guidelines, which sets forth standards for using a greenhouse gas reduction plan to address the GHG emissions of specific projects. Under this Guideline, compliance with the GHG Plan can be used in appropriate situations to determine the significance of a project's effects relating to greenhouse gas emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG Plan.

Guideline section 15183.5(b) reads as follows:

(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:

- (A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- (B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- (C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- (D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- (E) Establish a mechanism to monitor the plan's progress towards achieving the level and to require amendment if the plan is not achieving specified levels;
- (F) Be adopted in a public process following environmental review.

(2) Use the Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document,

may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulative considerable, notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.

The provisions of the GHG Plan and the appendices that support the Plan comply with these provisions by providing a quantified inventory of currently existing and projected greenhouse gas emissions resulting from activities within a defined geographic area of the County. The GHG Plan and associated documents also identify and analyze the emissions associated with specific actions, and set forth performance standards to achieve the specified emissions goals. The GHG Plan establishes a GHG emissions reduction target for 2020 of 15% below 2007 emissions, consistent with AB 32 and sets the County on a path to achieve more substantial long term reduction in the post-2020 period. Achieving this level of emissions will ensure that the contribution to greenhouse gas emissions from activities covered by the GHG Plan will not be cumulatively considerable. The analysis in the GHG Plan and the supporting documents demonstrates that this level will be achieved by the identified mitigation measures. The Plan also includes requirements to monitor progress towards achieving the specified emissions goals, and provisions for amendment of the Plan if it is not making sufficient progress towards reaching those goals. Finally, the GHG Plan, including monitoring, will be adopted in a public process following environmental review.

Screening Tables, in the form presented in Appendix F of the GHG Plan, will serve as a tool to assist with implementing applicable mitigation based on calculated GHG reduction and they will aid in the determination of a significance finding. The Screening Tables incorporate a point system that is based on calculated emission reductions for various GHG mitigation using accepted emission factors. The point system is designed to ensure compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those from existing development, will allow the County to meet its GHG emissions reduction target. Consistent with the CEQA Guidelines Sections 15064(h)(3) and 15064.4, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions.

Projects that do not use the Screening Tables, will be required to quantify project specific GHG emissions or otherwise demonstrate that project specific GHG emissions will be consistent with the reduction measures in the GHG Plan and achieve the GHG emissions efficiency reduction as a 100-point project, which will allow the County to achieve the GHG reduction targets in the GHG Plan. Consistent with the CEQA Guidelines, projects that can demonstrate this level of reduction or greater will be determined to have a less than significant individual and cumulative impact for GHG emissions. In some cases, projects may not be able to achieve sufficient reductions in GHG emissions (identified through the use of the Screening Tables or through project-specific quantification), thus resulting in a preliminary determination of a significant impact on GHG emissions that will require preparation of an EIR to analyze the project's impacts and possible mitigation.

Monitoring of Plan implementation in order to track progress, to determine whether emissions are being reduced as forecasted, and to provide a platform for future revisions to the plan, if necessary, is a critical activity. In order to retain the benefits of CEQA streamlining and tiering of

2.0 PROJECT DESCRIPTION

the analysis of greenhouse gas emissions for future projects as described in the CEQA Guidelines Section 15183.5 above, the Plan must include a mechanism to monitor the plan's progress towards achieving the level of proposed emissions reductions and to require amendment if the plan is not achieving specified levels. Monitoring is more fully described in section GHG 5.7 below and the process for amending the Plan is described in section GHG 5.9.

Consequently, the County, through CEQA and the County Development Code, will ensure that new development within the County's LUA area meets the requirements set forth in this Plan. This Plan represents a local plan to reduce GHG emissions 15% below 2007 emissions by 2020 consistent with AB 32, and constitutes an "adopted list of regulations and requirements to implement a local plan" as specified in the CEQA Guidelines. Furthermore, the Plan contains an analysis that extends beyond 2020 to 2030 with consideration of the trajectory of reductions needed to provide substantial reductions by 2050 (see Appendix E), consistent with CARB's recommendations for looking forward in its Scoping Plan.

The Plan does not allow larger residential or mixed-use projects outside a City Sphere of Influence (SOI) to use the Screening Tables or rely on this Plan for a determination that the project's individual or cumulative GHG impacts are less than significant. This provision ensures land use commitments outside of SOIs do not impede the expected emissions trajectory to mid-century and are not likely to conflict with the long term goal of substantial reductions through 2050. This provision is an interim procedure that will be re-examined in a major Plan update and amendment anticipated to occur in 2015 following a new emissions inventory and incorporation of the SCS and Regional GHG reduction measures.

Residential projects (or mixed use projects with a residential component) that exceed 250 dwellings units that are located in unincorporated areas not within a City SOI will not be eligible to use the Screening Tables or rely on this Plan for a determination of less than significant on individual or cumulative GHG impacts. (See Appendix F for a full description of the limitations and uses of the Screening Table)

Residential Projects outside of a City SOI that exceed 250 dwelling units will be required to prepare a project specific GHG emissions analysis that includes a robust assessment of emissions, appropriate mitigation measures, and analysis of the issues associated with land use intensification and VMT generation on a project and regional basis. The analysis must produce an assessment that allows for a determination of whether the specific project causes cumulatively considerable GHG impacts. These projects will not qualify for the tiering and streamlining benefits otherwise provided by this Plan as allowed by CEQA Guidelines Section 15183.5 due to the inability to adequately analyze and incorporate programmatic mitigation that comprehensively addresses the issues of GHG emissions for regionally significant residential projects beyond the 2020 analysis horizon. It is anticipated that upon completion of the Sustainable Communities Strategy (SCS) by Southern California Association of Governments (SCAG) and the Regional GHG Reduction Plan currently under preparation by the San Bernardino County Association of Governments (SANBAG), adequate methodology for quantification of regional VMT and more comprehensive mitigation will provide suitable planning tools that can be incorporated into this Plan through a future amendment. Both the SCS and the Regional GHG Reduction Plan are intended to satisfy the requirements of SB 375 and allow better forecasts of GHG emissions for future years as well as providing a regional strategy for reducing GHG emissions.

3.0 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

3.0 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

The following is an introduction to the environmental analysis for the proposed San Bernardino County (County) General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). This introduction also describes the approach used in the cumulative analysis and provides a discussion of the general assumptions used in the environmental analysis. As noted in Sections 1.0 and 2.0, the focus of the Draft Supplemental Environmental Impact Report (SEIR) is on the changes associated with the proposed actions and whether those changes will result in new significant environmental effects or a substantial increase in the severity of previously identified significant environmental effects that were identified in the County General Plan Program EIR (State Clearinghouse 2005101038) (General Plan EIR). The individual technical sections of the Draft SEIR (Sections 3.1 through 3.11) provide further information on the specific assumptions and methodologies used in the analysis for each particular technical subject.

ANALYSIS APPROACH USED TO EVALUATE THE IMPACTS OF THE PROPOSED PROJECT

The County General Plan Program EIR (General Plan EIR) was certified in March 2007 and provides a programmatic analysis of the environmental effects of the County of San Bernardino County 2007 General Plan. Findings of fact and a statement of overriding considerations were adopted as part of the actions on the General Plan and EIR in March 2007. The primary purpose of this Draft SEIR is to satisfy California Environmental Quality Act (CEQA) requirements by providing the additional analysis necessary to make the previous General Plan EIR adequately apply to the new proposed Project. Because this document is a Draft SEIR, it will address the environmental effects of implementing the proposed Project in light of the previous environmental review in the General Plan EIR, as provided for under CEQA Guidelines Sections 15162 and 15163. An SEIR provides additional information necessary to make the previous EIR adequately apply to the project as revised. Accordingly, the SEIR need contain only the information necessary to respond to the project changes, changed circumstances, or new information that triggered the need for additional environmental review (CEQA Guidelines Section 15163).

The impact analysis in this Draft SEIR utilizes General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement – see **Tables 2-5** through **2-14** in Chapter 2.0) would result in new significant environmental effects not previously addressed in the General Plan EIR or a substantial increase in severity of previously identified significant environmental effects consistent with CEQA Guidelines Section 15162(a)(1). Specific subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction to implement are not known at this time. Thus, this analysis is conducted at a programmatic level in a similar manner that was used in the 2007 General Plan EIR. This level of analysis evaluates possible physical environmental effects of implementation of the GHG Plan reduction measures. Certain GHG reduction measures that are included in the GHG Emissions Reduction Plan have been developed by the state and regional agencies. The environmental evaluation of the state measures have been previously considered in Functional Equivalent documents, which are comparable to EIRs. Evaluation is accomplished via review of environmental documents prepared by the California Air Resources Board (CARB) for implementation of GHG emissions reduction programs (functional equivalent documents).

STRUCTURE OF THE ENVIRONMENTAL IMPACT ANALYSIS

Sections 3.1 through 3.11 of this Draft SEIR contain a detailed description of setting conditions (including applicable regulatory setting), an evaluation of the direct and indirect environmental

3.0 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

effects resulting from the implementation of the proposed Project, identification of General Plan policies and programs and Development Code sections that mitigate environmental effects. Furthermore, Sections 3.1 through 3.11 of this Draft SEIR contain additional feasible mitigation measures and identify whether significant environmental effects of the project would remain after application of policies, programs, and feasible mitigation measures. The individual technical sections of the Draft SEIR include the following information:

Existing Setting

This subsection includes a description of the physical setting associated with the technical area of discussion, consistent with CEQA Guidelines Section 15125. The General Plan EIR provides the background for the existing setting with updated information as needed.

Regulatory Framework

This subsection identifies applicable federal, state, regional, and local plans, policies, laws, and regulations that apply to the technical area of discussion.

Impacts and Mitigation Measures

The Draft SEIR addresses the environmental effects of implementing the proposed Project in light of the previous environmental review in the San Bernardino County General Plan Program EIR (General Plan EIR) as provided for under CEQA Guidelines 15162 and 15163. Specifically, the Draft SEIR evaluates whether the proposed Project would result in new significant environmental effects not previously addressed in the San Bernardino County General Plan Program EIR (State Clearinghouse No. 2005101038) or a substantial increase in severity of previously identified significant environmental effects consistent with CEQA Guidelines Section 15162(a)(1).

The Impacts and Mitigation subsection identifies direct and indirect environmental effects associated with implementation of the proposed Project. Standards of significance are identified and used to determine whether the environmental effects are considered significant and require the application of mitigation measures. Each environmental impact analysis is identified numerically (e.g., Impact 3.4.1: Natural Habitat Areas/Sensitive Species/Wildlife Corridors) and is supported by substantial evidence.

Mitigation measures for the proposed Project consist of performance standards that identify clear requirements that would avoid or minimize significant environmental effects (the use of performance standard mitigation is allowed under CEQA Guidelines Section 15126.4(a) and is supported by case law *Rio Vista Farm Bureau Center v. County of Solano* ([1st Dist. 1992] 5 Cal. App. 4th at pp. 371, 375–376 [7 Cal. Rptr. 2d 307])).

APPROACH TO THE CUMULATIVE IMPACT ANALYSIS

CEQA Guidelines Section 15130 requires that EIRs include an analysis of the cumulative impacts of a project when the project's effect is considered cumulatively considerable. Each technical section in the Draft SEIR considers whether the project's effect on anticipated cumulative setting conditions is cumulatively considerable (i.e., a significant effect). "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (CEQA Guidelines, Section 15065(a)(3)). The determination of whether the project's impact on cumulative conditions is considerable is based on a number of factors including consideration of applicable public agency standards, consultation with public

agencies, and expert opinion. The environmental effects of potential development within the unincorporated portions of the county in the cumulative impact analysis are contained within each technical section. Chapter 4 provides a summary of the cumulative impacts associated with the proposed Project.

The cumulative setting conditions considered in this Draft SEIR are based on the General Plan EIR and its previous environmental assessment of cumulative impacts and any additional impacts that may occur as a result of implementation of the proposed Project. The Draft SEIR cumulative analysis focuses on whether there is a new significant cumulative impact or a substantially more severe cumulative impact than was identified in the General Plan EIR and if so, whether the project's contribution to that impact makes it cumulatively considerable.

ENVIRONMENTAL IMPACT REPORTS UTILIZED IN THE DRAFT SEIR AND CONSIDERATION OF STATE REDUCTION MEASURES

The Draft SEIR utilizes technical information and analyses from previously prepared EIRs that are relevant to the consideration of environmental effects of the proposed Project. This approach is supported by CEQA Guidelines Section 15148, which states that preparation of an EIR is dependent upon information from many sources, including technical documents, and that such documents should be cited but not included in the EIR. In addition to materials cited elsewhere in this Draft SEIR, information from the following documents has been reviewed and utilized in preparing this Draft SEIR:

- San Bernardino County General Plan Update Program EIR (State Clearinghouse No. 2005101038)
- Facts, Findings, and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update
- Functional Equivalent Document for Renewable Electricity Standard (California Air Resources Board 2010f)
- Functional Equivalent Document for Climate Change Scoping Plan (California Air Resources Board 2008, SCH# 2008102060)
- Functional Equivalent Document for California Cap on GHG Emissions and Market-Based Compliance Mechanisms (California Air Resources Board 2010d, SCH# 2010102056)
- Functional Equivalent Document for Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375 (California Air Resources Board 2010e, SCH# 201008102)

By utilizing provisions of the CEQA Guidelines, the County, in preparing this Draft SEIR, has been able to make maximum feasible and appropriate use of the technical information in these documents. These documents are not incorporated into this SEIR, but were used as information sources for the preparation of the SEIR.

R1 reduction measures (existing and proposed state and regional building energy measures that do not require County action) have been reviewed and environmentally assessed in one or more of the aforementioned functional equivalent documents. **Table 3-1** summarizes R1 measures and provides the functional document where the measures are environmentally

3.0 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

assessed. Analysis of the physical environmental effects of R1 measures is not included in the analysis provided in the subsequent technical sections of this Draft SEIR. As indicated in Section 2.0, R1 measures do not require additional County action. Such measures are, however, properly identified in the GHG Plan as measures that will result in emissions reductions in the County, given that such measures are required to be implemented.

The status of one of the CEQA functional equivalent documents cited above, the Functional Equivalent Document for Climate Change Scoping Plan (California Air Resources Board 2008), is currently uncertain as a result of a court decision in the case of *Association of Irrigated Residents v California Air Resources Board* (San Francisco Superior Court Case No. CPF-09-509562). In a March 18, 2011 decision, the court found that the California Air Resources Board had not adequately explained why it selected a scoping plan that included a cap and trade program rather than an alternative plan. As this Draft SEIR was being finalized, press reports indicated that the scope of the court's writ remained to be determined, and also that an appeal could be taken, so the status of the decision remains somewhat uncertain, but as a result of the decision, the California Air Resources Board may be required to revise the functional equivalent document before proceeding further with the AB 32 Scoping Plan. The decision found defects in the CEQA review for the scoping plan, but did not find any defects in the substantive provisions of the scoping plan itself. In particular, the decision did not specifically address the substantive provisions of the scoping plan that are included in the formulation of the R1 measures listed in the GHG plan, and is not expected to affect the substantive content of those measures.

**TABLE 3-1
R1 REDUCTION MEASURES AND ASSOCIATED FUNCTIONAL EQUIVALENT DOCUMENTS**

R1 Reduction Measures (Existing and proposed state and regional energy measures that do not require County action)	CARB Functional Equivalent Document
R1E1 and R1E1-INT: RPS – 33 percent by 2020	Climate Change Scoping Plan
R1E2 and R1E2-INT: AB 1109 Residential Lighting	California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1E4: Electricity Energy Efficiency (AB 32)	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1E5: Natural Gas Energy Efficiency (AB 32)	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1E6: Increased Combined Heat and Power (AB 32)	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1E7: Industrial Boiler Efficiency (AB 32)	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T1 and R1T1-INT: California Light-Duty Vehicle GHG Standards: Implement Pavley I Standards	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms

3.0 INTRODUCTION TO THE ENVIRONMENTAL ANALYSIS

R1 Reduction Measures (Existing and proposed state and regional energy measures that do not require County action)	CARB Functional Equivalent Document
R1T2 and R1T2-INT: California Light-Duty Vehicle GHG Standards: Implement Pavley II	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T3 and R1T3-INT: Low Carbon Fuel Standard	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T4 and R1T4-INT: Tire Pressure Program	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T5 and R1T5-INT: Low Rolling Resistance Tires	Climate Change Scoping Plan
R1T6 and R1T6-INT: Low Friction Engine Oils	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T7 and R1T7-INT: Cool Paints and Reflective Glazing	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T8: Goods Movement Efficiency Measures	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T9 and R1T8-INT: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1T10 and R1T9-INT: Medium- and Heavy-Duty Vehicle Hybridization	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R111: Oil and Gas Extraction Combustion Related GHG Emission Reduction	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R112: Stationary Internal Combustion Engine Electrification	Climate Change Scoping Plan
R113: Carbon Intensity Standard for Cement Plants	Climate Change Scoping Plan
R114: Carbon Intensity Standard for Concrete Batch Plants	Climate Change Scoping Plan
R115: Waste Reduction in Concrete Use	Climate Change Scoping Plan
R1A1: Methane Capture at Large Dairies	Climate Change Scoping Plan California Cap on GHG Emissions and Market-Based Compliance Mechanisms
R1WC1: Per Capita Water Use Reduction Goal Policy	Climate Change Scoping Plan

3.1 AESTHETICS AND VISUAL RESOURCES

3.1 AESTHETICS AND VISUAL RESOURCES

This section describes the visual conditions and resources of San Bernardino County, summarizes its landscape characteristics, and discusses the impacts associated with implementation of the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). The existing setting and analysis in this section utilizes the County of San Bernardino 2007 General Plan and its associated Environmental Impact Report, as well as recently prepared environmental review documents for renewable energy projects in the county and the County of San Bernardino Development Code.

3.1.1 EXISTING SETTING

EXISTING CONDITIONS

San Bernardino County is the largest county in the continental United States, with a land area of 20,106 square miles. The county contains vast undeveloped tracts of land that offer significant scenic vistas. San Bernardino County consists of three distinct geographic regions: the Mountains, the Valley, and the Desert. These diverse geographies not only vary by terrain but also in visual character. The three areas, combined, encompass all the unincorporated lands within the county (San Bernardino County 2006, p. IV-4).

Numerous designated federal, state, and local open space and recreational areas throughout the county offer scenic vistas and views. These areas include 28 designated Bureau of Land Management (BLM) Wilderness Areas among other BLM land holdings, which constitute approximately 47 percent of San Bernardino County's total acreage. Other key recreational areas that offer scenic vistas and views include two National Parks (2.6 percent), one National Preserve (10.7 percent), two National Forests (3.6 percent), four State Parks (.2 percent), and eight regional parks (.05 percent) (San Bernardino County 2006, p. IV-4).

Scenic Vistas

Vast undeveloped areas and undisturbed scenic vistas in the county provide a significant scenic resource as they contrast against the developed urban areas. Designated federal, state, and local open space and recreational areas offer scenic vistas and views, if they are visible, and provide a break from the urban landscape.

Valley Region

The Valley Region consists of all the area that is south and west of the National Forest boundaries along the foothills of the San Gabriel and San Bernardino mountain ranges. The San Bernardino Mountain range, where it trends southeast, forms the eastern limit of the Valley Region, along with the Yucaipa and Crafton Hills. The southern limits of the Valley are marked by alluvial highlands of the Laloma Hills, Jurupa Hills, and Chino Hills where they extend westerly from the San Geronio Pass to their intersection with the Los Angeles coastal plan region (San Bernardino County 2006, p. IV-5).

The Valley Region is approximately 60 miles east of the Pacific Ocean and borders Los Angeles, Orange, and Riverside counties. It is approximately 50 miles long from west to east and encompasses 500 square miles. The region covers only 2.5 percent of the total county land, but holds approximately 75 percent of the county's population. Elevations in the Valley range from about 500 feet on the valley floor to 1,700 feet in Live Oak Canyon and to about 5,400 feet in the Yucaipa Hills. Most of the Valley lies within the jurisdiction of 15 cities (San Bernardino County 2006, p. IV-6).

3.1 AESTHETICS AND VISUAL RESOURCES

The predominant native plant communities within the undeveloped areas of the Valley Region are chaparral, coastal sage scrub, deciduous woodlands, grasslands, and wetlands. Vegetation in urbanized areas consists of primarily of introduced exotic landscape species. The visual character of the Valley Region is primarily an urban landscape that spreads out against a backdrop of steeply ascending mountain ranges to the north and east and low-lying hills to the south and west (San Bernardino County 2006, p. IV-6).

Mountain Region

North of the Valley Region is the Mountain Region, consisting of the San Bernardino and San Gabriel mountain ranges. Elevations range from 2,000 feet along the foothills to the 11,502-foot summit of Mount San Gorgonio, the highest peak in Southern California. Of the 872 square miles within this region, approximately 715 square miles are public lands managed by state and federal agencies, principally the U.S. Forest Service. The region contains chaparral-covered slopes generally below the 4000-foot elevation and forests, meadows, and lakes (San Bernardino County 2006, p. IV-6).

The San Gabriel Mountains, which extend from Los Angeles County, border the western end of the Mountain Region. The San Gabriel Mountains form about one-third of the Mountain Region, with the San Bernardino Mountains making up the remainder. The San Bernardino Mountains feature four large lakes (Big Bear Lake, Silverwood Lake, Lake Arrowhead, and Lake Gregory), and many smaller lakes. The Mountain Region is the perfect setting for year-round sports and recreational opportunities offering ample scenic opportunities. The differences in elevation and topography are primarily responsible for variations in temperature and precipitation. The headwaters of the Santa Ana River lie within these mountains. In addition to the Santa Ana River, the region contains four other major creeks and rivers: Mill Creek, Lytle Creek, Deep Creek, Mojave River, and Whitewater River (San Bernardino County 2006, p. IV-6).

The predominant plant communities in the Mountain Region include chaparral, sage scrub, deciduous woodlands, conifer forests, and wetlands. The Mountain Region sustains many unique plant associations due to the diverse geology and varied microclimates. Higher rainfall amounts and cooler temperatures support mountain vegetation at the higher elevations. The visual character of the Mountain Region is defined by a rugged forested landscape consisting of prominent ridgelines and steep canyons interspersed with small isolated communities, valleys, and lakes that contain scattered populations (San Bernardino County 2006, p. IV-6).

Desert Region

The Desert Region includes a significant portion of the Mojave Desert and contains about 93 percent (18,735 square miles) of the land area within San Bernardino County. The Desert Region is defined as including the area that extends north to the boundaries with Kern and Inyo counties and easterly to the state borders of Nevada and Arizona. The Desert Region also extends westerly to the boundary with Los Angeles County. From a landscape perspective, the Desert Region is further subdivided into the high desert and the low desert (San Bernardino County 2006, p. IV-7).

A major physical resource of the Desert Region is the Mojave River, which is among the few rivers that both flow in a northerly direction and do not empty into an ocean. (The Mojave River travels north and east away from its watershed in the San Bernardino Mountains.) The major part of the river's 100-mile-plus length is marked by a dry riverbed that only on occasion reveals the water within it. Except in exceedingly wet years, the Mojave River ends its flow just north of the Mojave

Narrows in the Helendale area. Significant wet years produce flows that extend to Afton Canyon and ultimately to Soda Dry Lake (San Bernardino County 2006, p. IV-7).

The Desert Region is the largest geographic area in San Bernardino County and includes the greatest diversity of plant communities within the county, including at least ten distinct plant communities that support a great diversity of biological resources. These plant communities include white fir woodland, pinyon/juniper woodland, desert sage shrub, Joshua tree woodland, Mojave Desert scrub, saltbush scrub, alkali sink, dunes, and wetlands. The visual character of the Desert Region is defined by its arid landscape, consisting of sparsely vegetated mountain ranges and broad valleys with expansive bajadas and scattered dry lakes. The region provides extensive open space and expansive vistas (San Bernardino County 2006, p. IV-7).

Scenic Routes

Numerous interstate routes, state highways, county roads, and roads on federal lands are either designated scenic highways or byways. **Table 3.1-1** lists state highways eligible for official designation as a State Scenic Highway, and **Table 3.1-2** lists the routes that are designated as scenic routes in the General Plan. The Rim of the World Highway is a Scenic Byway that has been designated by the United States Forest Service (USFS) and includes portions of State Routes (SR) 138, 18, and 38. The BLM has also designated a number of remote desert roadways as Back Country Byway, which is intended to alert people to their scenic quality. There are also a number of other scenic routes designated by the California Department of Transportation (Caltrans) and a number of locally designated scenic routes that are subject to land use and aesthetic controls, including portions of Interstate 15 (I-15), Interstate 40, and SR-395 (San Bernardino County 2006, p. IV-4).

**TABLE 3.1-1
ELIGIBLE STATE SCENIC ROUTES IN SAN BERNARDINO COUNTY**

Route	District	Location (From/To)	Post Miles
I-10	8	State Route (SR) – 38 near Redlands to Riverside County Line	30.9 – 29.7
SR-18	8	SR-138 near Mt. Anderson to SR-247 near Lucerne Valley	R17.7 – 73.8
SR-30	8	SR-330 near Highland to I-10 near Redlands	T29.5 – 33.3
SR-38	8	I-10 near Redlands to SR-18 near Fawnskin	0.0 – 49.5
SR-58	6/8	SR-14 near Mojave to I-15 near Barstow	112.0 – R4.5
SR-127	8/9	I-15 near Baker to Nevada State Line	L0.0 – 49.4
SR-138	8	SR-2 near Wrightwood to SR-18 near Mt. Anderson	6.6 – R37.9
SR-142	8	Orange County Line to Peyton Drive	0.0 – 4.4
SR-247	8	SR-62 near Yucca Valley to I-15 near Barstow	0.0 – 78.1

Source: San Bernardino County 2006, p. IV-15

3.1 AESTHETICS AND VISUAL RESOURCES

**TABLE 3.1-2
COUNTY DESIGNATED SCENIC ROUTES**

West Valley Region
SR-11 – All unincorporated frontage
SR-83 – All unincorporated frontage south of Riverside Drive
Mt. Baldy Road from Los Angeles County Line northeast to Mt. Baby
SR-83 – Curled Avenue/Mountain Avenue from 24 th Street northwest to San Antonio Dam
Wilson Avenue
Day Creek Boulevard
East Valley Region
Cedar Avenue from Bloomington Avenue south to Riverside County Line
Nevada Street within the Redlands Sphere of Influence (SOI)
Alabama Street within the Redlands SOI
I-10 from the City of Redlands southeast to the City of Yucaipa
San Bernardino Avenue within the Redlands SOI
Mentone Boulevard within the Redlands SOI
Colton Avenue within the Redlands SOI
Citrus Avenue within the Redlands SOI
Highland Avenue within the Redlands SOI
I-10 from the City of Redlands southeast to the City of Yucaipa
Fifth Avenue within the Redlands SOI
Crafton Avenue within the Redlands SOI
San Timoteo Canyon Road within the Loma Linda SOI
Beaumont Avenue within the Loma Linda SOI
Barton Road within the Loma Linda SOI
Orange Avenue within Loma Linda SOI
Nevada Street within the Loma Linda SOI
I-215 from San Bernardino northwest to I-15
Mountain Region
San Gabriel Mountains
Lone Pine Canyon Road
SR-2 from SR-138 southwest to Los Angeles County Line
SR-330 from the San Bernardino National Forest Boundary northeast to SR-18
Green Valley Lake Road/101 Mile Drive
Crest Forest Drive from SR-18 west to Sawpit Canyon Road
Playground Drive
Devil's Canyon Road

3.1 AESTHETICS AND VISUAL RESOURCES

Sawpit Canyon Road/Sawpit Creek Road
Lake Gregory Drive
San Moritz Drive
Dart Canyon Road
North Road from Lake Gregory Drive northeast to SR-189
Grass Valley Road
Kuffel Canyon Road
North Road from Lake Gregory Drive northeast to SR-189
Lake Drive from Knapps Cutoff northeast to Dart Canyon Road
Desert Region
Park Boulevard/Quail Springs Road from SR-62 southeast to Joshua Tree National Park
Amboy Road from Bullion Mountain Road northeast to Amboy
Kelbaker Road from I-15 southeast to I-40
SR-127 from I-15 at Baker northwest to Inyo County Line
Kelso-China Road from Kelso northeast to China
Cima Road from I-15 southeast to China
Essex Road from Essex northwest to Mitchell Caverns
Cedar Canyon Road from Kelso Cima Road southeast to Lanfair Road
Black Canyon Road
Parker Dam Road from Parker Dam southwest to the Colorado River Indian Reservation
Highway 395 to Highway 58
Multiple Planning Regions
I-15 Devore (junction with I-215) to the Nevada state line, excepting those areas within the Barstow Planning Area and the community of Baker where there is commercial/industrial development, those portions within the Yermo area from Ghost Town Road to the East Yermo Road Overcrossing on the north side, and all incorporated areas
SR-38 from Greenspot Road to Big Bear Dam
SR-138 from Crestline cutoff at SR-18 northwest to Los Angeles County
SR-173 from SR-18 northwest to Hesperia; from Hesperia west within the Hesperia SOI
Coxey Truck Trail from Bowen Ranch Road southeast to Rim of the World Drive
Rim of the World Drive from Green Valley Lake Road to SR-38
SR-18 from San Bernardino northeast to the City of Big Bear Lake; from Big Bear Lake northwest to Apple Valley; within the Victorville SOI; from Victorville and Adelanto to the Los Angeles County Line
Baldwin Lake Road from SR-18 southeast to Pioneertown Road; continuing east on Pioneertown Road to Burns Canyon Road; continuing southeast on Burns Canyon Road to Rimrock Road; continuing southeast on Rimrock Road to Pipes Canyon Road
National Trails Highway westerly from Oro Grande northeast to Lenwood easterly from Ft. Cady to I-15
I-40 from Ludlow northeast to Needles

3.1 AESTHETICS AND VISUAL RESOURCES

Lanfair/Ivanpah Road
Pioneer Road from Pipes Canyon Road to the Town of Yucca Valley
SR-247 (Old Woman Springs Road/Barstow Road) from the Town of Yucca Valley north to Barstow
SR-62 (Twentynine Palms Highway) from Riverside County Line northeast to the town of Yucca Valley; from the town of Yucca Valley east to Twentynine Palms; from Twentynine Palms southeast to Riverside County Line; from Riverside County Line northeast to state line

Source: San Bernardino County 2006, pp. IV-16 through IV-18

3.1.2 REGULATORY FRAMEWORK

STATE

State Scenic Highway Program

In 1963, the California legislature created the Scenic Highway Program to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to state highways. The state regulations and guidance governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. A highway may be designated scenic depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. A scenic corridor is the land generally adjacent to and visible from the highway and is identified using a motorist's line of vision. A reasonable boundary is selected when the view extends to the distant horizon.

Nighttime Sky – Title 24 Outdoor Lighting Standards

The California legislature passed a bill in 2001 requiring the California Energy Commission (CEC) to adopt energy efficiency standards for outdoor lighting for both the public and private sectors. In response to the legislature in November 2003, the CEC adopted changes to the Title 24, parts 1 and 6, Building Energy Efficiency Standards. These standards became effective on October 1, 2005, and included changes to the requirements for outdoor lighting for residential and nonresidential development. The new standards will likely improve the quality of outdoor lighting and help to reduce the impacts of light pollution, light trespass, and glare. The standards regulate lighting characteristics such as maximum power and brightness, shielding, and sensor controls to turn lighting on and off. Different lighting standards are set by classifying areas by lighting zone. The classification is based on population figures of the 2000 Census. These areas are designated as LZ1 (dark), LZ2 (rural), or LZ3 (urban).

LOCAL

San Bernardino County General Plan

The San Bernardino County General Plan includes policies and programs that assist in preserving the existing visual character of the natural environment, protecting scenic views, and preserving the night sky. For instance, in order to preserve natural resources, the General Plan requires the establishment of buffer areas between natural resources and developed areas. The General Plan also contains policy provisions that protect natural vegetation, defines what a "scenic route" is and specifies applicable policies to maintain such routes as scenic, and provides lighting restrictions with each land use or building permit application. For a complete list of the

applicable policies, please refer to the Methodology subsection below, which provides all of the General Plan policies and programs that address visual resources in the county. These policies are designed to guide future development in a way that lessens impacts to these features. These provisions are discussed in more detail in the impact discussions below.

San Bernardino County Community Plans

Fourteen community plans have been prepared for individual areas of the county. Community plans identify land use goals and policies unique to those areas. These plans, which became effective on April 12, 2007, have the primary purpose of guiding the future use and development of land within the community plan area in a manner that preserves the character and independent identity of the respective communities. Community plans focus on a particular community within the overall area covered by the General Plan. As an integral part of the overall General Plan, the community plans are consistent with the General Plan.

San Bernardino Development Code

Division 3, Countywide Development Standards

Chapter 83.02 of the Development Code mandates standards to ensure that all development produces an environment of stable and desirable character which is harmonious with existing and future development, consistent with the General Plan. For instance, Chapter 83.02 identifies maximum height restrictions for structures as well as standards for the screening and buffering of adjoining land uses, equipment, and outdoor storage areas, as well as surface parking areas. Similarly, Chapter 83.06 identifies maximum height restrictions for hedges, walls, and fences and ensures that these elements do not unnecessarily block views and sunlight. These requirements are designed to provide aesthetic enhancement of the county.

Chapter 83.07 regulates glare, outdoor lighting, and night sky protection. For instance, outdoor lighting of commercial or industrial land uses in the Valley Region must be fully shielded to preclude light pollution or light trespass. Lighting fixtures used to illuminate a new off-site sign and exterior illuminated on-site signs in the Mountain and Desert regions are required to be mounted on the top of the sign structure and must comply with the shielding requirements specified in detail in the County Code. The purpose of Chapter 83.07 is to encourage outdoor lighting practices and systems that will minimize light pollution, glare, and light trespass; conserve energy and resources while maintaining nighttime safety, visibility, utility, and productivity; and curtail the degradation of the nighttime visual environment.

Chapter 83.08 of the Development Code ensures that development in hillside areas is guided through established regulations and that future development in these areas is designed to fit the existing landform.

Chapter 83.10 is enforced with the purpose of enhancing the aesthetic appearance of the county by providing standards related to the quality and functional aspects of landscaping. Chapter 83.10 requires most new development to include plans for landscaping, subject to standards specified in the chapter, and Chapter 83.11 ensures the provision and maintenance of well-designed off-street parking facilities in conjunction with a use or development.

3.1 AESTHETICS AND VISUAL RESOURCES

Division 4, Standards for Specific Land Uses and Activities

Chapter 84.19 of the Development Code was created in order to establish standards and procedures for the siting and operation of various types and sizes of commercial recycling facilities. Requirements under Chapter 84.19 state that the operator and/or host business of any recycling collection or processing facility must, on a daily basis, remove any and all recyclable materials or solid wastes that have accumulated or are deposited outside the containers, bins, or enclosures intended as receptacles for these materials. Chapter 84.19 also mandates maximum floor space for these facilities, setbacks, landscaping, and applicable development standards.

Chapter 84.24 establishes standards for the provision of solid waste (refuse) and recyclable material storage areas in compliance with state law. Contained within this chapter are location standards and design and construction standards for such storage areas.

Chapter 84.26 of the Development Code provides a uniform and comprehensive set of standards for the placement of accessory wind energy systems on parcels in unincorporated areas of the county in order to encourage the generation of electricity for on-site use, thereby reducing the consumption of electrical power supplied by utility companies. These regulations are intended to ensure that accessory wind energy systems are designed and located in a manner that minimizes visual impacts on the surrounding community. For instance, under normal circumstances, only one unit per parcel is allowed. (However, additional units may be allowed at the rate of one unit for every 10 acres to a maximum of three units.) Wind energy systems must be installed with at least 240 feet separation from each other. If the wind energy systems are 50 feet in height, a maximum of two units may be installed per 5 acres (maximum heights are determined by land use zoning and county region). For every additional 5 acres, one additional unit may be added, not to exceed a maximum of five units. Additionally, the separation between the units may be reduced to twice the height of the systems.

Chapter 84.29 establishes standards and permits procedures for the establishment, maintenance, and decommissioning of renewable energy generation facilities. Development standards for wind energy and solar energy projects, such as height restrictions, setbacks, and unit spacing requirements, are contained within this chapter of the Development Code.

3.1.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of aesthetic impacts of the General Plan (San Bernardino County 2006, p. IV-8).

- 1) Have a substantial adverse effect on a scenic vista.
- 2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- 3) Substantially degrade the existing visual character or quality of the site and its surroundings.
- 4) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR, and the impact conclusions set forth the Facts, Findings, and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant visual impacts or a substantial increase in severity of previously identified visual impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's three previously disclosed aesthetic impacts:

Impacts AES-1, 2, and 3 – Significant impacts on aesthetics, views and scenic resources may occur due to the increased growth and development projected during the build-out of the General Plan Update. (San Bernardino County 2007c, p. 4)

As identified in General Plan CEQA Findings, these impacts were identified as significant and unavoidable even with the adoption of identified mitigation measures (San Bernardino County 2007c, pp. 4 and 5). The following adopted General Plan policies and programs address visual quality and are designed to guide future development in a way that lessens impacts to visual resources. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

- | | |
|------------------|--|
| Policy D/CI 1.4 | Preserve the rural character by discouraging required urban-scale improvements such as curbs, gutters and street lighting where the public health, safety and welfare are not endangered. |
| Policy CO 1.2 | The preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. The County will continue the review of the Land Use Designations for unincorporated areas within one mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas. |
| CO 1.2 Program 1 | The County shall coordinate with state and federal agencies for the identification of buffering techniques and the creation of mitigation banks for sensitive species within the Valley, Mountain, and Desert Regions. The County shall work with local governments to conserve critical habitat and minimize recreational use in sensitive areas supporting local, state, or federally protected species. As feasible, the County shall work with the Army Corps of Engineers (ACOE), the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG) to establish mitigation banks or conservation easements for unincorporated areas supporting local, state, or federally protected species as a better long-term solution to habitat fragmentation and piece-meal mitigation. |

3.1 AESTHETICS AND VISUAL RESOURCES

- CO 1.2 Program 2 The County will coordinate with appropriate agencies (e.g., USFWS, California Natural Diversity Data Base, Bureau and Land Management (BLM), National Park Service, California Native Plant Society, and so forth) and interested groups (e.g., Audubon Society, San Bernardino County Museum) to develop, fund and implement a geographic information and web-based database system for identifying important biological resources and natural open space areas within the Valley, Mountain, and Desert Regions of the County. The implementation of the aforementioned geographic information and database system is a commitment to update and enhance the Biological and Open Space Overlays within a specific area prior to approval of any subsequent development plans. This program includes the maintenance of the web-based database with completed Biological Opinions that will contribute to the evaluation of cumulative impacts from previously approved projects. Furthermore, the County shall quarterly fund the San Bernardino County Museum (Museum) to review and update the Biological Resources and Open Space Overlays to facilitate an accurate and current spatial data based on local, state, and federally protected species and their habitats.
- Policy M/CO 1.2 Protect scenic vistas by minimizing ridgeline development that would substantially detract from the scenic quality of major ridgeline viewsheds.
- Policy M/CO 1.7 Encourage conservation and sound management of the mountain forest character and natural resources, including water, streams, vegetation, soils and wildlife. Require the planting of native or drought-tolerant cultivar species, capable of surviving the mountain environment and climate.
- Policy M/CO 2.2 The County shall work with the local Fire Safe Council and Fire agencies in the development of Community Wildfire Protection Plans (CWPP) for the mountain communities. As part of this effort, a study shall be prepared to determine appropriate forest management techniques and identify any necessary modifications to the County's Tree Preservation Ordinance to ensure the long term health of the forest.
- Policy M/CO 2.3 Require the re-vegetation of any graded surface with suitable native drought and fire resistant planting to minimize erosion.
- Policy M/CO 2.4 Establish a parking provision for the purpose of saving healthy trees in parking areas by giving parking credit for areas containing specimen trees.
- Policy M/CO 2.5 Adopt and enforce tree protection and forest conservation provisions and standards as listed in the Development Code.
- Policy M/CO 2.6 Parking credit reductions from the required parking may be allowed for proposed parking spaces containing healthy and vigorous native specimen trees, when consistent with the standards specified in the County Development Code.

3.1 AESTHETICS AND VISUAL RESOURCES

- Policy M/CO 2.7 Through the development review process, require replanting of ground cover in denuded areas with vegetation, either indigenous to the area or compatible with the montane climate and soil characteristics.
- Policy M/CO 5.1 Protect the Night Sky by providing information about and enforcing existing ordinances (Chapter 83.07 of the County Code).
- Policy M/CO 5.2 Provide information about the Night Sky ordinance and lighting restrictions with each land use or building permit application.
- Policy M/CO 5.3 Review exterior lighting as part of the design review process.
- Policy M/CO 5.4 All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards.
- Policy M/CO 5.5 Allow for mountain communities' input on the need for, and placement of, new street lights.
- Policy D/CO 1.1 Encourage the greater retention of existing native vegetation for new development projects to help conserve water, retain soil in place and reduce air pollutants.
- Policy D/CO 1.2 Require future land development practices to be compatible with the existing topography and scenic vistas, and protect the natural vegetation.
- Policy D/CO 1.3 Require retention of existing native vegetation for new development projects, particularly Joshua trees, Mojave yuccas and creosote rings, and other species protected by the Development Code and other regulations. This can be accomplished by:
- a. Requiring a landscape plan, approved as part of the location and development plan review and approval process for all new development projects.
 - b. Requiring the Building Official to make a finding that no other reasonable siting alternatives exist for development of the land prior to removal of a protected plant.
 - c. Encourage on-site relocation of Joshua trees and Mojave yuccas. However, if on-site relocation is not feasible require developers to consult a list that will be established and maintained in the County Building and Safety Office of residents willing to adopt and care for relocated trees.
 - d. The developer/home builder shall bear the cost of tree or yucca relocation.
 - e. Retention and transplantation standards will follow best nursery practices.

3.1 AESTHETICS AND VISUAL RESOURCES

- Policy D/CO 1.5 Mechanical removal of vegetation shall be minimized and limited to the building pad, driveway and areas prepared for permitted accessory uses.
- Policy D/CO 1.6 In the landscaping of individual sites, native and other drought tolerant plants shall be encouraged.
- Policy D/CO 1.10 Preserve scenic vistas where natural slope exceeds 15 percent by requiring building foundations for residential, non-residential and accessory structures to conform to the natural slope to ensure that rooflines do not eliminate or dominate the ridge lines or that the natural landform is not significantly impacted by excessive grading or erosion.
- Policy D/CO 1.11 Encourage the retention of specimen sized Joshua Trees (as defined below) by requiring the Building Official to make a finding that no other reasonable siting alternative exists for the development of the land. Specimen size trees are defined as meeting one or more of the following criteria:
- a. Circumference measurement equal to or greater than 50 inches measured at 4 feet from grade.
 - b. Total tree height of 15 feet or greater.
 - c. Trees possessing a bark-like trunk.
 - d. A cluster of ten (10) or more individual trees, of any size, growing in close proximity to each other.
- Policy D/CO 3.1 Protect the Night Sky by providing information about and enforcing existing ordinances:
- a. Provide information about the Night Sky ordinance and lighting restrictions with each land use or building permit application.
 - b. Review exterior lighting as part of the design review process.
- Policy D/CO 3.2 All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards.
- Policy OS 1.1 Provide for uses that respect open space values by utilizing appropriate land use categories on the Land Use maps. Land use zoning districts appropriate for various types of open space preservation include: Agriculture (AG), Floodway (FW), Resource Conservation (RC), and Open Space (OS).
- Policy OS 1.9 Ensure that open space and recreation areas are both preserved and provided to contribute to the overall balance of land uses and quality of life.

3.1 AESTHETICS AND VISUAL RESOURCES

- Policy OS 4.2 The County will preserve and encourage the management of suitable land for greenbelts, forests, recreation facilities and flood control facilities to assist the County's efforts to provide adequate water supply, achieve air quality improvement, and provide habitat for fish, wildlife and wild vegetation.
- Policy OS 5.1 Features meeting the following criteria will be considered for designation as scenic resources:
- a. A roadway, vista point, or area that provides a vista of undisturbed natural areas.
 - b. Includes a unique or unusual feature that comprises an important or dominant portion of the viewshed (the area within the field of view of the observer).
 - c. Offers a distant vista that provides relief from less attractive views of nearby features (such as views of mountain backdrops from urban areas).
- Policy OS 5.2 Define the scenic corridor on either side of the designated route, measured from the outside edge of the right-of-way, trail, or path. Development along scenic corridors will be required to demonstrate through visual analysis that proposed improvements are compatible with the scenic qualities present.
- Policy OS 5.3 The County desires to retain the scenic character of visually important roadways throughout the County. A "scenic route" is a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the County. Therefore, the County designates [several] routes as scenic highways and applies all applicable policies to development on these routes
- Policy OS 7.2 For natural open space areas that require separation from human activity to preserve their function and value, limit construction of roads into or across natural open space areas.
- Policy OS 7.3 Because open space can promote neighborhood and civic identity by providing a clear definition to districts and neighborhoods, the County supports the use of open space and landscaping to define neighborhoods and district boundaries and to delineate edges between the natural and built environment.
- Policy OS 7.5 Require that natural landform and ridgelines be preserved by using the following measures:
- a. Keep cuts and fills to an absolute minimum during the development of the area.
 - b. Require the grading contours that do occur to blend with the natural contours on site or to look like contours that would naturally occur.

3.1 AESTHETICS AND VISUAL RESOURCES

- c. Encourage the use of custom foundations in order to minimize disruption of the natural landform.
- d. Require that units located in the hillsides be so situated that roof lines will blend with and not detract from the natural ridge outline.

Policy OS 7.6 Require that hillside development be compatible with natural features and the ability to develop the site in a manner that preserves the integrity and character of the hillside environment, including but not limited to, consideration of terrain, landform, access needs, fire and erosion hazards, watershed and flood factors, tree preservation, and scenic amenities and quality.

The impact analysis below uses these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project would result in a new visual impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts AES-1, 2, and 3.

Specific subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible visual impacts of implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emissions reduction (functional equivalent documents – see Section 3.0 for a description of these documents).

IMPACTS AND MITIGATION MEASURES

Scenic Vista, Scenic Resources, and Routes or Existing Scenic Character

Impact 3.1.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts to scenic vistas, scenic resources, and the existing scenic character of the county (General Plan EIR Impacts AES-1 and 2). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. However, subsequent implementation of GHG Plan reduction measures that provide for renewable energy facilities could result in an increased severity of scenic impacts beyond what was considered in the General Plan EIR. **Thus, the proposed Project would substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

The implementation of the following reduction measures in the GHG Plan could have the potential to result in increased visual impacts beyond what was considered in the General Plan EIR.

Reduction measures R2E1 through R2E4, R2E6 through R2E10, R2E6-INT, R2E8-INT, and R3E9 through R3E14 could involve installation of solar and photovoltaic panels and related facilities, wind generators, and other renewable energy facilities that have the potential to impact scenic vistas and resources due to their heightened visibility. However, the visual impact of these

facilities is addressed and generally mitigated through Development Code Chapters 83.02 (General Development and Use Standards – setback requirements and screening and buffering requirements that are intended to address land use compatibility), 83.06 (Fences, Hedges and Walls – aesthetic design of fences and walls that would likely be used to screen facilities), 83.07 (Glare and Outdoor Lights – illumination and light trespass standards that address impacts to nearby residential areas as well as public right-of-way), 83.10 (Landscape Standards – provision of landscape screening), Chapter 84.26 (Wind Energy Systems-Accessory – limit on wind generators, height, and siting to avoid visual impacts), and 84.29 (Renewable Energy Generation Facilities – setback, height, wind generator spacing, and special fencing standards to land use compatibility and visual effects). However, it should be noted that these regulations do not restrict the placement of wind generators along hillsides and ridgelines (which are visually prominent locations and can substantially alter the landscape characteristics of areas of the county from the structure and associated safety lighting) and do not apply to facilities located on federal or state lands. Thus, visual impacts from the further promotion of renewable energy generating facilities on federal and state lands as well as along hillside and ridgelines would have a substantial increased severity of impacts to county scenic resources associated with the proposed Project.

Reduction measures R2T7, R2T8, R3T1, R3T2, R3T4, R3T10, R2W1 through R2W7, R3W1, R3W2, R3W4, and R3W5 could involve the construction of new facilities and improvements that may alter the scenic characteristics of the county. General Plan Policy CO 1.2 states that the preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. Under the auspices of this policy, the County will continue the review of the land use designations for unincorporated areas within 1 mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficient building controls are applied to protect the visual and natural qualities of these areas. In addition, General Plan Policy D/CO 1.2 requires future land development practices to be compatible with the existing topography and scenic vistas, and protect the natural vegetation. These policy provisions will ensure that subsequent actions under the proposed GHG Plan will result in minimized impacts to scenic vistas.

In addition, Policy OS 5.3 defines a scenic route as a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the county. The County has designated several routes as scenic highways (see **Tables 3.1- 1** and **3.1-2** above); all applicable policies to proposed development will apply to any development on these routes. Furthermore, Policy OS 7.2 provides that construction of roads into or across natural open space areas be limited in natural open space areas that require separation from human activity to preserve their function and value. Policy M/CO 2.3 requires the re-vegetation of any graded surface with suitable native drought- and fire-resistant planting in the Mountain Region, and similarly Policy M/CO 2.7 requires replanting of ground cover in denuded Mountain Region areas with vegetation. Policy D/CO 1.2 requires future land development practices in the Desert Region to be compatible with the existing topography and scenic vistas and to protect the natural vegetation, while Policy D/CO 1.3 requires retention of existing native vegetation for new development projects, particularly Joshua trees, Mojave yuccas and creosote rings, and other species.

In addition to these General Plan policy provisions, Section 82.19.040 (Development Criteria within Scenic Areas) of Chapter 82.19 of the Development Code relates specifically to preserving aesthetic or scenic areas within the county. Development criteria within scenic areas were established with the intent to provide development standards that will protect, preserve, and enhance the aesthetic resources of the county. Design considerations can be incorporated in many instances to allow development to coexist and not substantially interfere with the

3.1 AESTHETICS AND VISUAL RESOURCES

preservation of unique natural resources, roadside views, and scenic corridors. Similarly, Chapter 83.01 of the Development Code establishes uniform performance standards for development in the county that promotes compatibility with surrounding areas and land uses.

As noted above, implementation of the General Plan policies and Development Code would largely address the additional visual impacts of the GHG Plan reduction measures associated with the proposed Project. However, visual impacts from the further promotion of renewable energy generating facilities on federal and state lands, as well as along hillsides and ridgelines, would have a substantial increased severity of impacts to county scenic resources. Given that wind generators are often located along hillsides and ridgelines (in order to take advantage of wind conditions) and that the County does not have land use jurisdiction on federal and state lands, there are no feasible mitigation measures to mitigate this impact. **Thus, the proposed Project results in a substantial increase in the severity of this impact. This substantial increase that would result from the proposed Project is a significant and unavoidable impact.**

New Source of Substantial Light or Glare

Impact 3.1.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts associated in glare and nighttime lighting (General Plan EIR Impact AES-3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project would not increase the severity of nighttime lighting impacts. However, subsequent implementation of GHG Plan reduction measures that provide for renewable energy facilities could result in an increased severity of daytime glare beyond what was considered in the General Plan EIR. **Thus, the proposed Project would substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a potentially significant impact of the proposed Project.**

The General Plan EIR and General Plan EIR CEQA Findings found that despite the imposition of certain mitigation measures, the impact of new sources of light and glare resulting from implementation of the General Plan could not be mitigated to below a level of significance. However, there are no proposed GHG Plan reduction measures that would substantially alter the amount of future artificial light in the county that were programmatically evaluated in the General Plan EIR. In addition, Development Code Chapter 83.07 regulates lighting practices and systems that minimize light pollution, glare, and light trespass; conserves energy and resources while maintaining nighttime safety, visibility, utility, and productivity; and curtails the degradation of the nighttime visual environment. Therefore, impacts associated with nighttime artificial light are considered less than significant.

The main potential sources of daytime glare resulting from the proposed Project would be from proposed GHG Plan reduction measures that promote the installation of solar photovoltaic panels (e.g., Residential Renewable Energy Incentives [R2E3], Warehouse Renewable Incentive Program [R2E4], and the installation of solar and other renewable energy sources on County buildings [R2E8-INT]). The potential for glare from a photovoltaic panel surface exists when the angle of the sun to the surface is such that light is reflected toward a viewer. Most photovoltaic panels are equipped to change orientation during the course of a day, tracking the sun across a 90-degree arc. For instance, at midday, all reflections from a surface of the panels would be toward or near the sun's position in the sky. As solar energy producing facilities and solar water heating panels can reflect sunlight skyward, there is a potential for glare impacts to aircraft.

Similarly, at a certain angle photovoltaic panels could also present glare impacts to motorists traveling in the vicinity as well as residents in the area if reflections from the surface of the panels were directed toward a roadway or residences. The County Development Code includes the following standards that would assist in reducing daytime glare impacts:

- Chapter 83.02 (General Development and Use Standards – setback requirements and screening and buffering requirements that would minimize line of sight glare effects)
- Chapter 83.10 (Landscape Standards – provision of landscape screening that would minimize line of sight glare effects)
- Chapter 84.29 (Renewable Energy Generation Facilities – setback, height, wind generator spacing and special fencing standards that would screen potential glare effects)

While these development standards would assist in mitigating this increase in severity of the daytime glare impacts, the following mitigation measure is required to further address daytime glare impacts.

Mitigation Measures

MM 3.1.2 Development Code Section 84.29.040 (Solar Energy Development Standards) shall be amended to include the following standard for glare:

- Solar energy facilities shall be designed to preclude daytime glare on any abutting residential land use zoning district, residential parcel, or public right-of-way.

Implementation of this mitigation measure would reduce daytime glare impacts by setting a development standard to prohibit off-site daytime glare impacts. Thus, this impact would be reduced to less than significant. **There is no new or substantially more severe significant impact.**

3.2 AGRICULTURAL AND FORESTRY RESOURCES

3.2 AGRICULTURAL AND FORESTRY RESOURCES

This section addresses agricultural lands and forestry resources and the potential impacts of the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project) on such lands. The existing setting and analysis in this section utilizes the County of San Bernardino 2007 General Plan and its associated Environmental Impact Report, as well as recently prepared environmental review documents for renewable energy projects in the county and the County of San Bernardino Development Code.

3.2.1 EXISTING SETTING

Agriculture has historically been an important part of San Bernardino County's economy. The county currently ranks in the top 17 agricultural-producing counties in California for gross value of agricultural production (USDA 2009). The value of agricultural production in the year 2008 for the county totaled \$547,158,000, a decrease of approximately \$25 million from the previous year (USDA 2009). The decrease in value is attributable to the lower economic output of nursery, flowers, and foliage products as well as livestock and livestock products.

FARMLAND CLASSIFICATION AND RATING SYSTEM

The Farmland Mapping and Monitoring Program (FMMP) administered by the California Department of Conservation maps agricultural areas based on soil quality and land use, with categories such as Prime Farmland, Farmland of Statewide Importance, and Grazing Lands. More information about these classifications is provided below.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program was established in 1982 to continue the important farmland mapping efforts begun in 1975 by the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service. The intent of the USDA was to produce agricultural resource maps based on soil quality and land use across the nation. As part of the nationwide agricultural land use mapping effort, the USDA developed a series of definitions known as Land Inventory and Monitoring (LIM) criteria. The LIM criteria classified land's suitability for agricultural production. Suitability included both the physical and chemical characteristics of soils and the actual land use. Important Farmland Maps are derived from the USDA soil survey maps using the LIM criteria.

Important Farmland Maps for California are compiled using the modified LIM criteria. The minimum mapping unit is 10 acres unless otherwise specified. Units of land smaller than 10 acres are incorporated into the surrounding classification. The Important Farmland Maps identify five agriculture-related categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. Each is summarized below, based on *A Guide to the Farmland Mapping and Monitoring Program* (DOC 1994) prepared by the Department of Conservation. The FMMP data is updated and released every two years. The most current information available from the FMMP is from 2008.

Prime Farmland

Prime Farmland is land with the best combination of physical and chemical features able to sustain the long-term production of agricultural crops. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields. Lands defined as Prime Farmland must have been used for production of irrigated crops at some time during the four years prior to the Important Farmland Map date.

3.2 AGRICULTURAL AND FORESTRY RESOURCES

Farmland of Statewide Importance

Farmland of Statewide Importance is land similar to Prime Farmland but with minor shortcomings such as greater slopes or with less ability to hold and store moisture. The land must have been used for the production of irrigated crops at some time during the four years prior to the Important Farmland Map date.

Unique Farmland

Unique Farmland is land of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include nonirrigated orchards or vineyards, as found in some climatic zones in California. The land must have been cultivated at some time during the four years prior to the Important Farmland Map date.

Farmland of Local Importance

Farmland of Local Importance is land of importance to the local economy, as defined by each County's local advisory committee and adopted by its Board of Supervisors. Farmland of Local Importance is either currently producing, or has the capability of production, but does not meet the criteria of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland.

Grazing Land

Grazing Land is land on which the existing vegetation, whether grown naturally or through management, is suited to the grazing of livestock. The minimum mapping unit for this category is 40 acres.

IMPORTANT FARMLAND

Table 3.2-1 provides a breakdown of farmland acreage based on the FMMP categories. The entire county includes approximately 14,089 acres of Prime Farmland, along with approximately 9,408 acres of Farmland of Statewide Importance and Unique Farmland as well as 1,829 acres of Farmland of Local Importance. These categories account for approximately 3 percent of the total number of agricultural acres in the county. **Table 3.2-1** does not take into account any development in the county after 2008, when the most recent Important Farmland Map was published.

**TABLE 3.2-1
FARMLAND IN SAN BERNARDINO COUNTY**

Farmland Type	Total Acres
Prime Farmland	14,089
Farmland of Statewide Importance	6,747
Unique Farmland	2,661
Farmland of Local Importance	1,829
Important Farmland Subtotal	25,326
Grazing Land	902,773
Agricultural Land Subtotal	926,992
Other Land*	246,412
Urban and Built-up Land	275,694
Water	449
Total	1,449,547

Source: DOC 2009

*Other Land indicates those lands not otherwise placed in a FMMP category. For San Bernardino County, this includes natural vegetation, rural residential, wetlands, and vacant lands.

FARMLAND CONVERSION

The conversion of lands suitable for agricultural to urban development and other uses is an issue of concern in California (see **Table 3.2-2**). San Bernardino County experienced the loss of 5,593 acres of Important Farmland between the years 2006 and 2008 (DOC 2009).

**TABLE 3.2-2
FARMLAND CONVERSION IN SAN BERNARDINO COUNTY 2006–2008**

Land Use Category	Acreage – 2006	Acreage – 2008	Net Acreage Change
Prime Farmland	17,046	14,089	-2,957
Farmland of Statewide Importance	7,938	6,747	-1,191
Unique Farmland	3,150	2,661	-489
Farmland of Local Importance	2,785	1,829	-956
Important Farmland Subtotal	30,919	25,326	-5,593
Grazing Land	902,854	901,666	-1,188
Agricultural Land Total	933,773	926,992	-6,781

Source: DOC 2009

FOREST RESOURCES

The Mountain Region is the region of the county containing the largest amount of forest land. According to the General Plan, forest communities in the Mountain Region consist of riparian forests, cismontane woodlands, interior closed-cone coniferous forests, lower montane

3.2 AGRICULTURAL AND FORESTRY RESOURCES

coniferous forests, upper montane coniferous forests, and subalpine coniferous forests. Most of the Mountain Region is covered by the Angeles and San Bernardino national forests (San Bernardino County 2006, p. IV-6). The **SAN GABRIEL FOREST RESERVE** was established on December 20, 1892, and the **SAN BERNARDINO FOREST RESERVE** on February 25, 1893. They became **NATIONAL FORESTS** on March 4, 1907, and were combined on July 1, 1908, with all of the San Bernardino forest and portions of San Gabriel forest and Santa Barbara forest composing the new Angeles National Forest (USFS 2010b). On September 30, 1925, portions of the Angeles National Forest and the **CLEVELAND NATIONAL FOREST** were detached to re-establish the **SAN BERNARDINO NATIONAL FOREST** (USFS 2010b).

San Bernardino National Forest

The San Bernardino National Forest's inception was in 1907. It comprises 676,666 acres that provide open space and recreational opportunities for the residents of southern California (USFS 2010b). The San Bernardino National Forest was set aside for the conservation of natural resources such as trees, water, minerals, livestock range, recreation, and wildlife. The National Forest serves as an outdoor recreation destination. In addition, it provides valuable watershed protection. It is one of the most urban-influenced National Forests in the system, with over 400 miles of urban interface and 147,313 acres of in holdings within its boundary (San Bernardino County 2007b, p. VI-4). Significant portions of National Forest System (NFS) lands surround, are interspersed, or are adjacent to parcels under County jurisdiction.

A challenge facing the San Bernardino National Forest is the increasing population of southern California and the resulting effects on NFS lands. Privately owned open space is being converted to commercial and residential developments and supporting infrastructure (roads, utility corridors, landfills, etc.) (San Bernardino County 2007b, p. VI-4). There are numerous facilities located within NFS lands, such as utility corridors, communication sites, dams, diversions, and highways already located in the San Bernardino National Forest. It is anticipated that over time, because of population increase in southern California, there will be an increased demand from private, semiprivate, and public industry, corporations, associations, and private individuals for requests for additional use on these public lands (San Bernardino County 2007b, p. VI-4).

Angeles National Forest

The Angeles National Forest covers 655,387 acres (USFS 2010a), of which 10,352.42 acres are located within San Bernardino County (San Bernardino County 2007b, p. VI-4). The forest elevations range from 1,200 to 10,064 feet above sea level. Much of the National Forest is covered with dense chaparral, which changes to pine- and fir-covered slopes at higher elevations (San Bernardino County 2007b, p. VI-4).

3.2.2 REGULATORY FRAMEWORK

FEDERAL

Farmland Protection Policy Act

The Natural Resources Conservation Service (NRCS), a federal agency within the U.S. Department of Agriculture, is the agency primarily responsible for implementation of the Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize federal programs' contribution to the conversion of farmland to nonagricultural uses by ensuring that federal programs are administered in a manner that is compatible with state, local, and private programs designed to protect farmland. NRCS provides technical assistance to federal

agencies, state and local governments, tribes, or nonprofit organizations that desire to develop farmland protection programs and policies.

NRCS summarizes FPPA implementation in an annual report to Congress. The FPPA also established the Farmland Protection Program and Land Evaluation and Site Assessment (LESA).

Farmland Protection Program

The NRCS administers the Farmland Protection Program, a voluntary program aimed at keeping productive farmland in agricultural uses. Under the Farmland Protection Program, NRCS provides matching funds to state, local, or tribal government entities and nonprofit organizations with existing farmland protection programs to purchase conservation easements. The goal of the program is to protect between 170,000 and 340,000 acres of farmland per year (USDA-NRCS 2010). Participating landowners agree not to convert the land to nonagricultural use and retain all rights to use the property for agriculture. A minimum of 30 years is required for conservation easements and priority is given to applications with perpetual easements. NRCS provides up to 50 percent of the fair market value of the easement being conserved (USDA-NRCS 2010).

To qualify for a conservation easement, farmland must meet several criteria. The land must be:

- Prime, Unique, or other productive soil, as defined by NRCS based on factors such as water moisture regimes, available water capacity, developed irrigation water supply, soil temperature range, acid-alkali balance, water table, soil sodium content, potential for flooding, erodibility, permeability rate, rock fragment content, and soil rooting depth;
- Included in a pending offer to be managed by a nonprofit organization, state, tribal, or local farmland protection program;
- Privately owned;
- Placed under a conservation plan;
- Large enough to sustain agricultural production;
- Accessible to markets for the crop that the land produces; and
- Surrounded by parcels of land that can support long-term agricultural production.

Forest Plans

USFS Land and Resources Management Plans (Forest Plans) describe the management of National Forests. These plans apply only to federal lands under the administration of the U.S. Forest Service; they are not applicable to privately owned land within the National Forest boundaries or privately owned land adjacent to the National Forest boundaries. The following types of decisions are made in the Forest Plans:

1. Establishment of forest-wide objectives, with a description of the desired condition;
2. Establishment of forest-wide management standards;
3. Establishment of management areas and management prescriptions;

3.2 AGRICULTURAL AND FORESTRY RESOURCES

4. Establishment of lands suitable for the production of timber;
5. Establishment of monitoring and evaluation requirements; and
6. Recommendations to Congress of areas eligible for wilderness or wild and scenic river designation.

Southern California National Forests – Land and Resource Management Plan

The Southern California National Forests Land and Resource Management Plan covers the Angeles National Forest, Cleveland National Forest, Los Padres National Forest, and San Bernardino National Forest. Land and Resource Management Plans are the general plan documents that direct all National Forest management. The Land and Resource Management Plan of Southern California National Forests addresses issues such as air quality, diversity, facilities fire and fuels, lands, historical and cultural resources, minerals, law enforcement, recreation, and wilderness, as well as state and federally listed species and Forest Sensitive species, critical habitat linkages and wildlife corridors, protection of roadless areas, and protection of riparian areas, among others.

STATE

California Department of Conservation

The Department of Conservation administers and supports a number of programs, including the Williamson Act, the California Farmland Conservancy Program, the Williamson Act Easement Exchange Program, and the Farmland Mapping and Monitoring Program. These programs are designed to preserve agricultural land and provide data on conversion of agricultural land to urban use. The Department of Conservation is responsible for approving Williamson Act Easement Exchange Program agreements.

Important Farmland Inventory System and Farmland Mapping and Monitoring Program

The Important Farmland Inventory System initiated in 1975 by the U.S. Soil Conservation Service (now NRCS) classifies land based on ten soil and climatic characteristics. The Department of Conservation started a similar system of mapping and monitoring for California in 1980, known as the FMMP.

Under the California Environmental Quality Act (CEQA), the lead agency is required to evaluate agricultural resources in environmental assessments at least in part based on the FMMP. The state's system was designed to document how much agricultural land in California was being converted to nonagricultural land or transferred into Williamson Act contracts. The definitions of Important Farmland types are provided in the Farmland Mapping and Monitoring Program discussion in the Existing Setting section above.

Williamson Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is a nonmandated state program, administered by counties and cities to preserve agricultural land and discourage the premature conversion of agricultural land to urban uses. The act authorizes local governments and property owners to (voluntarily) enter into contracts to commit agricultural land to specified uses for ten or more years. Once restricted, the land is valued for taxation based on its agricultural income rather than unrestricted market value, resulting in a

lower tax rate for owners. In return, the owners guarantee that these properties remain under agricultural production for an initial ten-year period. The contract is renewed automatically unless the owner files a notice of nonrenewal, thereby maintaining a constant ten-year contract. Currently, approximately 70 percent of the state's prime agricultural land is protected under this act. Participation is on a voluntary basis by both landowners and local governments and is implemented through the establishment of agricultural preserves and the execution of Williamson Act contracts.

Termination of a Williamson Act contract through the nonrenewal process is the preferred method to remove the enforceable restriction of the contract. Cancellation is not appropriate when objectives served by cancellation could be served by nonrenewal. Cancellation is reserved for unusual, "emergency" situations. In order to approve tentative cancellation, a board or council must make specific findings based on substantial evidence that a cancellation is consistent with the purposes of the act or in the public interest. Contracts can specify that both findings must be made in order to approve tentative cancellation.

Forest Practices Rules

The Z'berg-Nejedly Forest Practice Act of 1973 established a set of rules known as the Forest Practice Rules (FPRs) to be applied to forest management related activities (i.e., timber harvests, timberland conversions, fire hazard removal, etc.) on privately owned timberlands within the State of California. They are intended to ensure that timber harvesting is conducted in a manner that will preserve and protect fish, wildlife, forests, and streams. Under the Forest Practice Act, a Timber Harvesting Plan (THP) is submitted to the California Department of Forestry and Fire Protection (Cal-Fire) by the landowner outlining what timber is proposed to be harvested, the harvesting method, and the steps that will be taken to prevent damage to the environment. If the landowner intends to convert timberland to non-timberland uses, such as a winery or vineyard, a Timberland Conversion Permit (TCP) is required in addition to the THP. It is Cal-Fire's intent that a THP shall not be approved which fails to adopt feasible mitigation measures or alternatives from the range of measures set out or provided for in the Forest Practice Rules, which would substantially lessen or avoid significant adverse environmental impacts resulting from timber harvest activities. THPs are required to be prepared by Registered Professional Foresters (RPFs) who are licensed to prepare these plans.

LOCAL

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to protect agriculture and forest lands. For instance, the General Plan contains policy provisions that identify commercially viable agricultural areas and discourages incompatible development from occurring within these areas. Similarly, the General Plan requires the County to closely review development projects on private land adjacent to National Forest lands to ensure that development projects are capable of meeting all development requirements within the project boundaries or other non-federal land. For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address agricultural and forest resources in the county. These policies are designed to guide future development in a way that lessens impacts to agricultural and forest resources. These provisions are discussed in more detail in the impact discussions below.

3.2 AGRICULTURAL AND FORESTRY RESOURCES

San Bernardino County Community Plans

Fourteen community plans have been prepared for individual areas of the county. Community plans identify land use goals and policies unique to those areas. These plans, which became effective on April 12, 2007, have the primary purpose of guiding the future use and development of land within the community plan area in a manner that preserves the character and independent identity of the respective communities. Community plans focus on a particular community within the overall area covered by the General Plan. As an integral part of the overall General Plan, the community plans are consistent with the General Plan.

San Bernardino Development Code

Division 2, Land Use Zoning Districts and Allowed Land Uses

Chapter 82.03 of the Development Code mandates the land uses that may be allowed within the agricultural and resource management land use zoning districts established by the General Plan, determines the type of planning permit/approval required for each use, and provides basic standards for site layout and building size. Chapter 82.07 is intended to create, preserve, and improve areas for small-scale and medium-scale agricultural uses with the use of agricultural overlay designations. This chapter establishes regulations to allow animal keeping as a primary use of land, though all animal-keeping land uses must comply with public health laws regarding proper care and the maximum number of animals. Similarly, Chapter 82.08 provides for the creation of agricultural preserves in certain areas of the county as defined in the California Land Conservation Act of 1965 (Williamson Act). Chapter 82.19 regulates timber harvesting within or adjacent to public rights-of-way to be limited to that which is necessary to maintain and enhance the quality of the forest.

Division 3, Countywide Development Standards

Chapter 83.10 of the Development Code regulates landscaping proposed within the Mountain Region of the county. Such proposals are in conjunction with a forest conservation plan and insect infestation prevention program, prepared by a Registered Professional Forester (RPF), and submitted by the developer. The plan is required to include guidelines for tree preservation, both during and after construction. Existing trees that are removed to accommodate development are required to be replaced according to recommendations of a forest conservation plan.

Division 8, Resource Management and Conservation

Chapter 88.01 (Plant Protection and Management) provides regulations and guidelines for the management of plant resources in the unincorporated areas of the county on property or combinations of property under private or public ownership. The intent of Chapter 88.01 is to promote plant life within the county through appropriate management techniques, conserve the native plant life heritage, regulate native plant and tree removal activity, protect and maintain local watersheds, and preserve habitats for rare, endangered, or threatened plants and to protect animals with limited or specialized habitats. Chapter 88.01 of the Development Code requires the issuance of a permit prior to the removal of regulated trees and plants.

3.2.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of impacts to agricultural lands and forest lands of the General Plan (San Bernardino County 2006, p. IV-23).

- 1) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use.
- 2) Conflict with existing zoning for agricultural use or a Williamson Act contract.
- 3) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to nonagricultural use.

In addition, based on Appendix G of the CEQA Guidelines, forest land resource impacts are normally considered to be significant if the following could result from the implementation of the proposed Project. These provisions of Appendix G did not exist at the time the General Plan EIR was prepared.

- 1) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 5110(g)).
- 2) Result in the loss of forest land or conversion of forest land to non-forest use.
- 3) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant visual impacts or a substantial increase in severity of previously identified agricultural-related impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's two previously disclosed agricultural impacts:

Impacts AG-1 and 2 – Implementation of the General Plan Update will result in the decline of agricultural uses within the County due to urban expansion and economic considerations. (San Bernardino County 2007c, p. 5)

3.2 AGRICULTURAL AND FORESTRY RESOURCES

As identified in the General Plan CEQA Findings, these impacts were identified as significant and unavoidable even with the adoption of identified mitigation measures (San Bernardino County, 2007c, pp. 5 and 6).

The General Plan EIR did not address potential impacts to forest land conversion.

The following adopted General Plan policies and programs address agricultural and forest resources and are designed to guide future development in a way that lessens impacts to these resources. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

- | | |
|------------------|--|
| Policy M/LU 1.20 | Closely review development projects on private land adjacent to National Forest lands to ensure that development projects are capable of meeting all development requirements within the project boundaries or other non-federal land. Provide opportunities for the U.S. Forest Service to consult with the County on development of private land that may have an adverse effect on adjoining National Forest land. |
| Policy CO 1.2 | The preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. The County will continue the review of the Land Use Designations for unincorporated areas within one mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas. |
| CO 1.2 Program 1 | The County shall coordinate with state and federal agencies for the identification of buffering techniques and the creation of mitigation banks for sensitive species within the Valley, Mountain, and Desert Regions. The County shall work with local governments to conserve critical habitat and minimize recreational use in sensitive areas supporting local, state, or federally protected species. As feasible, the County shall work with ACOE, USFWS, and CDFG to establish mitigation banks or conservation easements for unincorporated areas supporting local, state, or federally protected species as a better long-term solution to habitat fragmentation and piece-meal mitigation. |
| CO 1.2 Program 2 | The County will coordinate with appropriate agencies (e.g., USFWS, California Natural Diversity Data Base, BLM, National Park Service, California Native Plant Society, and so forth) and interested groups (e.g., Audubon Society, San Bernardino County Museum) to develop, fund and implement a geographic information and web-based database system for identifying important biological resources and natural open space areas within the Valley, Mountain, and Desert Regions of the County. The implementation of the aforementioned geographic information and database system is a commitment to update and enhance the Biological and Open Space Overlays within a specific area prior to approval of any subsequent development plans. This program includes the maintenance of the web-based |

3.2 AGRICULTURAL AND FORESTRY RESOURCES

database with completed Biological Opinions that will contribute to the evaluation of cumulative impacts from previously approved projects. Furthermore, the County shall quarterly fund the San Bernardino County Museum (Museum) to review and update the Biological Resources and Open Space Overlays to facilitate an accurate and current spatial data based on local, state, and federally protected species and their habitats.

- Policy CO 6.1 Protect prime agricultural lands from the adverse effects of urban encroachment, particularly increased erosion and sedimentation, trespass, and non-agricultural land development.
- CO 6.1 Program 2 Support programs and policies that provide tax and economic incentives to ensure long-term retention of agricultural and other resource lands.
- Policy CO 6.3 Preservation of prime and statewide important soils types, as well as areas exhibiting viable agricultural operations will be considered as an integral portion of the Open Space element when reviewing development proposals.
- CO 6.3 Program 1 Utilize the provisions of the Williamson Act to further the preservation of commercially viable agricultural open space and designate preserves on the Land Use Policy Maps.
- CO 6.3 Program 2 Within commercially viable agricultural areas, encourage only land uses that are compatible with agriculture and maintain a list of compatible uses allowed within agricultural preserves.
- CO 6.3 Program 3 Consider the availability and financing of public services and utilities in any decision to convert the land use designation of an area from agricultural to non-agricultural uses. This information should be documented in special study reports.
- CO 6.3 Program 5 Designate Agricultural Land Use Zoning Districts and agricultural preserves on the Land Use Maps.
- CO 6.3 Program 6 Encourage expansion of agriculture in underutilized areas through actively promoting the establishment of agricultural lands where water is available in sufficient quantity.
- CO 6.4 Program 1 The minimum parcel size for agricultural districts within the valley portions of the County should be 10 acres.
- CO 6.4 Program 2 Encourage the minimum parcel size for agricultural districts in the desert portions of the County to be 40 acres outside the CDCA boundaries and 160 acres within the CDCA boundaries.
- Policy M/CO 1.7 Encourage conservation and sound management of the mountain forest character and natural resources, including water, streams, vegetation, soils and wildlife. Require the planting of native or

3.2 AGRICULTURAL AND FORESTRY RESOURCES

drought-tolerant cultivar species, capable of surviving the mountain environment and climate.

- Policy M/CO 2.2 The County shall work with the local Fire Safe Council and Fire agencies in the development of Community Wildfire Protection Plans (CWPP) for the mountain communities. As part of this effort, a study shall be prepared to determine appropriate forest management techniques and identify any necessary modifications to the County's Tree Preservation Ordinance to ensure the long term health of the forest.
- Policy M/CO 2.3 Require the re-vegetation of any graded surface with suitable native drought and fire resistant planting to minimize erosion.
- Policy D/CO 4.2 The conversion of agricultural land to non-agricultural uses shall be discouraged unless the proposed use can be demonstrated to be preferable in terms of economic development, and resource availability and resource conservation.
- Policy D/CO 4.3 Encourage adequate buffering between agricultural and nonagricultural land use zoning districts.
- Policy OS 1.1 Provide for uses that respect open space values by utilizing appropriate land use categories on the Land Use maps. Land use zoning districts appropriate for various types of open space preservation include: Agriculture (AG), Floodway (FW), Resource Conservation (RC), and Open Space (OS).
- Policy M/OS 1.1 Encourage the exchange of properties between the U.S. Forest Service and private property owners to facilitate better Forest Service boundary management.
- Policy M/OS 1.2 The County shall work with U.S. Forest Service to explore land exchange opportunities that would provide additional areas for open space, recreational opportunities and watershed protection; and offer the County the first right of refusal on lands available for exchange prior to being offered to the general public.
- Policy M/OS 1.6 Seek to ensure that undeveloped lands within the National Forest which are proposed to be transferred from Federal ownership are considered for open space values and be either retained by the U.S. Forest Service or otherwise preserved as permanent, public open space by the County or other public agencies.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts AG-1 and 2.

The exact subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the

County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible agricultural and forest land impacts of implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emissions reduction (functional equivalent documents – see Section 3.0 for a description of these documents).

IMPACTS AND MITIGATION MEASURES

Agricultural Impacts

Impact 3.2.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts to agricultural uses in the county due to urban expansion and economic considerations (General Plan EIR Impacts AG-1 and 2). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. However, renewable energy generating facilities promoted by the GHG Plan reduction measures are an allowed use in the Agriculture Zone and could result in increased severity of agricultural use impacts beyond what was considered in the General Plan EIR. **Thus the proposed Project would substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

According to the California Department of Conservation Land Use Conversion data (2009) as indicated in **Table 3.2-1**, San Bernardino County contains approximately 14,089 acres of Prime Farmland, 6,747 acres of Farmland of Statewide Importance, 2,661 acres of Unique Farmland, and 1,829 acres of Farmland of Local Importance (described hereafter as important farmlands). The county also contains approximately 901,666 acres of Grazing Land. The General Plan EIR found that despite the imposition of certain mitigation measures, impacts to agricultural lands resulting from implementation of the General Plan could not be mitigated to below a level of significance.

Implementation of certain reduction measures in the GHG Plan, such as the implementation of vehicle miles traveled reduction strategies (R2T2), the promotion of bicycle and pedestrian infrastructure (R2T7), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4), represents the reduction measures that could potentially encroach into areas supporting agricultural production. However, these reduction measures would involve the placement of improvements in existing urban and developed areas of the county; these agricultural use impacts were accounted for in the General Plan EIR under Impact AG-1 and Mitigations AG-1 and AG-3 (San Bernardino County 2006, p. IV-23 through IV-24).

Reduction measures R3E9 through R3E14 could result in renewable energy generating facilities and supporting facilities such as transmission lines that would convert or cross agricultural lands. Based on review of California Energy Commission's California Wind Resource Potential Map as well as the Draft Staff Report California Solar Resources (see page 18), large portions of the county have potential for renewable energy generating facilities. Wind and solar generating facilities are allowed in the Agriculture and Resource Conservation zone districts as provided in

3.2 AGRICULTURAL AND FORESTRY RESOURCES

the Development Code under Chapter 84.29. These facilities and supporting equipment (transmission lines) could result in the substantial loss of agricultural lands, including important farmlands, as well as result in conflicts with existing agricultural operations. The size of these facilities can vary from approximately 200 acres (Kramer Junction Solar Energy Center project) to 8,200 acres (Calico Solar Project). While implementation of Development Code Section 84.29.060 would require that renewable energy generating facilities restore the land conditions in a manner that could be reutilized for agricultural uses, the extent of the operational life of these facilities may be substantial. Conversely, GHG Plan reduction measures, such as the Residential Renewable Energy Incentives (R2E3), Warehouse Renewable Incentive Program (R2E4), and installation of solar photovoltaic systems on five County buildings (R2E8-INT), are not anticipated to impact agricultural lands because these GHG reduction strategies represent further intensification of an existing human setting rather than the complete loss of a more natural setting like agricultural lands.

The Valley Region contains considerable agricultural development, predominantly in the vicinity of the cities of Chino and Ontario in the west end of the valley and in the cities of Highland and Redlands in the east end of the valley. Most of the Mountain Region is not amenable to agricultural development. Little information is available regarding current agricultural development in the mountains, although it is assumed that existing agricultural activities are limited primarily to range and pasture uses (San Bernardino County 2006, p. IV-22). The community of Oak Glen remains the exception in the Mountain Region, where apple orchards and related agribusiness activities maintain the agricultural heritage of the area. As can be expected, agricultural development in the Desert Region is limited primarily to areas bordering the Mojave River. Historic alfalfa production occurs on a limited basis in areas that previously had sufficient groundwater for irrigation, such as Lucerne Valley and Harper Dry Lake (San Bernardino County 2006, p. IV-22).

The County General Plan includes policies and programs that address potential impacts to agricultural lands. For instance, Policy CO 6.3 states that preservation of prime and statewide important soils types, as well as areas exhibiting viable agricultural operations, will be considered an integral portion of the Open Space Element when reviewing development proposals. Associated CO 6.3 Program 2 states that in the case of commercially viable agricultural areas, land uses that are compatible with agriculture and maintain a list of compatible uses allowed within agricultural preserves are preferable. Policy D/CO 4.2 states that the conversion of agricultural land to nonagricultural uses is to be discouraged within the Desert Region of the county unless the proposed use can be demonstrated to be preferable in terms of economic development and resource conservation.

In addition, the County Development Code addresses potential impacts to agricultural lands. Chapter 82.03 mandates the land uses that are allowed within the agricultural and resource management land use zoning districts established by the General Plan, determines the type of planning permit/approval required for each use, and provides basic standards for site layout and building size. Chapter 82.08 provides for the creation of agricultural preserves in certain areas of the county as defined in the California Land Conservation Act of 1965 (Williamson Act), and Chapter 84.29 establishes standards and permits procedures for the establishment, maintenance, and decommissioning of renewable energy generation facilities. Development standards for wind energy and solar energy projects, such as height restrictions, setbacks, and unit spacing requirements, are contained within this chapter of the Development Code.

As noted above, implementation of General Plan policies and the Development Code would largely address the additional agricultural impacts of the GHG Plan reduction measures associated with the proposed Project. However, loss of agricultural from renewable energy

generating facilities could have a substantial increase in severity than what was identified in the General Plan EIR. The following mitigation measure is identified to minimize this impact.

Mitigation Measure

MM 3.2.1 Development Code Chapter 84.29 (Renewable Energy Generation Facilities) shall be amended to include the following standard:

- Work with transmission line providers and developers to design and cite supporting off-site facilities such as transmission lines, in a manner that will allow for continued use of adjoining agricultural operations as long as the agricultural operations do not interfere with the transmission right-of-way.

Implementation of the above mitigation measure would ensure that supporting off-site facilities are designed in a manner that allows for continued agricultural operations near the renewable energy generating facility. However, this mitigation measure would not completely offset the loss of agricultural resources. While prohibiting renewable energy generating facilities in the Agriculture and Resource Conservation zone districts could avoid this impact, these areas of the county make up the majority of land areas that have been identified by the California Energy Commission as having renewable energy generation potential (California Energy Commission's California Wind Resource Potential Map as well as the Draft Staff Report California Solar Resources). **Thus, the proposed Project results in a substantial increase in the severity of this impact. This substantial increase that would result from the proposed Project is a significant and unavoidable impact.**

Forest Land Impacts

Impact 3.2.2 The General Plan EIR did not evaluate potential physical environmental effects to forest lands resulting from implementation of the General Plan as such provisions of Appendix G did not exist at the time the General Plan EIR was prepared. Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not result in forest impacts. **Thus, the proposed Project would not result in a new significant impact related to forest land conversion. There is no new or substantially more severe significant impact.**

The Mountain Region of the county contains the majority of forest land, consisting of interior closed-cone coniferous forest, lower montane coniferous forest, upper montane coniferous forest, and subalpine coniferous forest (San Bernardino County 2006, p. IV-40).

Implementation of certain reduction measures in the GHG Plan, such as the implementation of vehicle miles traveled reduction strategies (R2T2), the promotion of bicycle and pedestrian infrastructure (R2T7), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4), represents the reduction measures that could potentially encroach into forest areas. However, these reduction measures would involve the placement of improvements in existing urban and developed areas of the county.

Reduction measures R3E9 through R3E14 would not likely result in renewable energy generating facility impacts for forest resources given that the Mountain Region is not located in an area identified for wind, solar, or geothermal energy generation based on review of California Energy

3.2 AGRICULTURAL AND FORESTRY RESOURCES

Commission's California Wind Resource Potential Map as well as the Draft Staff Report California Solar Resources (see page 18). GHG Plan reduction measures such as the Residential Renewable Energy Incentives (R2E3), Warehouse Renewable Incentive Program (R2E4), and installation of solar photovoltaic systems on five County buildings (R2E8-INT), are not anticipated to impact forest lands because these GHG reduction strategies represent further intensification of an existing human setting rather than the complete loss of a more natural setting like forest areas.

The General Plan includes policies and programs that address potential impacts to forest lands. For instance, Policy M/OS 1.6 addresses the forest lands of the Mountain Region by ensuring that undeveloped privately owned lands within the National Forest which are proposed to be transferred from federal ownership are considered for open space values and either retained by the U.S. Forest Service or otherwise preserved as permanent, public open space by the County or other public agencies. Similarly, Policy M/OS 1.2 states that the County will work with the U.S. Forest Service to explore land exchange opportunities that would provide additional areas for open space, recreational opportunities, and watershed protection; and offer the County the first right of refusal on lands available for exchange prior to being offered to the general public. Policy M/LU 1.20 requires the County to closely review development projects on private land adjacent to National Forest lands to ensure that development projects are capable of meeting all development requirements within the project boundaries or other non-federal land.

Furthermore, Policy M/CO 2.3 of the General Plan requires the re-vegetation of any graded surface with suitable native drought- and fire-resistant planting. Policy M/CO 1.7 encourages conservation and sound management of the mountain forest character and requires the planting of native or drought-tolerant cultivar species, capable of surviving the mountain environment and climate.

The County Development Code addresses potential impacts to forest lands. For instance, Chapter 82.19 of the Development Code regulates timber harvesting within or adjacent to public rights-of-way to be limited to that which is necessary to maintain and enhance the quality of the forest. Chapter 83.10 regulates forest lands within the Mountain Region of the county. Existing trees that are removed to accommodate development are required to be replaced according to recommendations of a forest conservation plan. The intent of Chapter 88.01 of the Development Code is to promote plant life within the county through appropriate management techniques, conserve the native plant life heritage, and regulate native plant and tree removal activity. Chapter 88.01 requires the issuance of a permit prior to the removal of regulated trees and plants.

Implementation of the above General Plan policies and Development Code provisions would ensure that the proposed Project would not result in an increase in severity of forest area impacts beyond what was addressed in the General Plan EIR. In addition, the Mountain Region of the county, which contains the majority of forest lands, is not located in an area identified for wind, solar, or geothermal energy generation based on review of California Energy Commission's California Wind Resource Potential Map as well as the Draft Staff Report California Solar Resources. **Thus, there is no new or substantially more severe significant impact.**

3.3 AIR QUALITY

This section examines the air quality in San Bernardino County, includes a summary of applicable air quality regulations, and analyzes potential air quality impacts associated with the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). The existing setting and analysis in this section utilizes the 2007 San Bernardino County General Plan (General Plan) and its associated Environmental Impact Report, as well as recently prepared environmental review documents for renewable energy projects in the county and the County of San Bernardino Development Code.

3.3.1 EXISTING SETTING

REGIONAL CLIMATE

South Coast Air Basin

The southwest portion of San Bernardino County lies within the South Coast Air Basin. The topography and climate of Southern California combine to make the South Coast Air Basin an area with a high potential for air pollution, which constrains efforts to achieve clean air. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cap over the cool marine layer and inhibits the pollutants in the marine layer from dispersing upward. In addition, light winds during the summer further limit ventilation. Furthermore, sunlight triggers the photochemical reactions that produce ozone, and this region experiences more days of sunlight than many other major urban areas in the nation (San Bernardino County 2006, p. IV-25).

Mojave Desert Air Basin

The majority of the county lies within the Mojave Desert Air Basin. The climate in the Mojave Desert Air Basin (MDAB) is arid with perennially and seasonal windy conditions. The cool moist coastal air from the South Coast Air Basin is blocked by the San Gabriel and San Bernardino mountain ranges. The area is characterized by hot, dry summers and mild winters, with annual rainfall averaging 2 to 5 inches per year. Meteorology tends to be influenced by a moderately intense anti-cyclonic circulation except during storm activity in the winter. During the winter, there are an average 20–30 winter storms. In the summer, the MDAB is usually influenced by a Pacific subtropical high cell that remains for long periods off the coast of California. The prevailing winds are out of the west and south, resulting in a general west to east flow across the MDAB. Prevailing winds are a major contributor to air quality conditions in the Desert Region (San Bernardino County 2006, p. IV-25).

AMBIENT AIR QUALITY STANDARDS

Both the U.S. Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) established ambient air quality standards for common air pollutants. These ambient air quality standards are levels of contaminants that represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The federal and California ambient air quality standards for criteria pollutants are summarized in **Table 3.3-1**. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, federal and state standards differ in some

3.3 AIR QUALITY

cases. In general, California standards are more stringent. This is particularly true for nitrogen dioxide (NO_x) and coarse particulate matter (PM₁₀).

On January 6, 2010, USEPA announced that they are reconsidering the ozone standards set in 2008. USEPA is proposing to strengthen the 2008 ozone 8-hour standards from 0.075 parts per million (ppm) down to a level within the range of 0.060–0.070 ppm and establish a seasonal “secondary” standard with the range of 7–15 ppm-hour to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. The scheduled deadline for CARB to submit the new nonattainment recommendations to USEPA will be in January 2011. USEPA plans to publish the final area designations in July 2011, and the new State Implementation Plan (SIP) would then be due to USEPA in December 2013.

**TABLE 3.3-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone (O ₃)	1-Hour	–	0.09 ppm
	8-Hour	0.075 ppm	0.07 ppm
Coarse Particulate Matter (PM ₁₀)	24-Hour	150 µg/m ³	50 µg/m ³
	Annual Average	–	20 µg/m ³
Fine Particulate Matter (PM _{2.5})	24-Hour	35 µg/m ³	–
	Annual Average	15 µg/m ³	12 µg/m ³
Carbon Monoxide (CO)	1-Hour	35 ppm	20 ppm
	8-Hour	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO ₂)	1-Hour	0.01ppm	0.18 ppm
	Annual Average	0.053 ppm	0.03 ppm
Sulfur Dioxide (SO ₂)	1-Hour	–	0.25 ppm
	24-Hour	0.075 ppm	0.04 ppm

Notes: ppm = parts per million, µg/m³ = micrograms per cubic meter

Source: CARB 2010b

AMBIENT AIR QUALITY

CARB maintains several air quality monitoring sites in San Bernardino County, including sites in Barstow, Trona, Victorville, Hesperia, and other communities. **Table 3.3-2** shows historical occurrences of pollutant levels exceeding state and federal ambient air quality standards for the two-year period of 2008 and 2009. The number of days that each standard was exceeded is shown. For example, the monitoring site at Olive Street in Hesperia measured 12.2 days in 2009 in which California PM₁₀ emission standards were exceeded.

**TABLE 3.3-2
 AMBIENT AIR QUALITY MONITORING DATA FOR SAN BERNARDINO COUNTY**

Pollutant Standards	2008	2009
Barstow Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	5	1
Federal 8-hour standard	7	5
State 8-hour standard	23	18
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	*	11.8
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	*	*
Crestline Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	78	70
Federal 8-hour standard	97	92
State 8-hour standard	115	106
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	*	*
Federal 24-hour standard (PM ₁₀)	*	*
Federal 24-hour standard (PM _{2.5})	*	*
Fontana-Arrow Highway Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	55	45
Federal 8-hour standard	58	48
State 8-hour standard	81	65
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	73.0	66.9
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	19.3	6.2
Hesperia – Olive Street Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	29	18
Federal 8-hour standard	58	40
State 8-hour standard	80	64

3.3 AIR QUALITY

Pollutant Standards	2008	2009
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	*	12.2
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	*	*
Joshua Tree – National Park Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	36	24
Federal 8-hour standard	72	59
State 8-hour standard	108	90
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	N/A	N/A
Federal 24-hour standard (PM ₁₀)	N/A	N/A
Federal 24-hour standard (PM _{2.5})	N/A	N/A
Phelan-Beekley Road and Phelan Road Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	32	19
Federal 8-hour standard	47	35
State 8-hour standard	73	55
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	N/A	N/A
Federal 24-hour standard (PM ₁₀)	N/A	N/A
Federal 24-hour standard (PM _{2.5})	N/A	N/A
Redlands-Dearborn Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	72	62
Federal 8-hour standard	75	73
State 8-hour standard	100	91
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	12.2	0
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	*	*
San Bernardino – 4th Street Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	62	53
Federal 8-hour standard	62	61
State 8-hour standard	87	78

Pollutant Standards	2008	2009
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	103.7	*
Federal 24-hour standard (PM ₁₀)	0	*
Federal 24-hour standard (PM _{2.5})	9.5	6.2
Trona-Athol and Telegraph Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	3	0
Federal 8-hour standard	7	2
State 8-hour standard	23	5
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	*	6.1
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	*	*
Upland Monitoring Site		
Ozone (number of days standard exceeded)		
State 1-hour standard	51	51
Federal 8-hour standard	50	48
State 8-hour standard	65	70
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	*	*
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	*	*
Victorville – 14306 Park Avenue		
Ozone (number of days standard exceeded)		
State 1-hour standard	16	8
Federal 8-hour standard	30	23
State 8-hour standard	59	53
Particulate Matter (number of days standard exceeded)		
State 24-hour standard (PM ₁₀)	*	6.1
Federal 24-hour standard (PM ₁₀)	0	0
Federal 24-hour standard (PM _{2.5})	*	0

Notes: * There is insufficient (or no) data available to determine the value. N/A – indicates that certain pollutant is not measured at monitoring site.

Source: CARB 2010a

3.3 AIR QUALITY

AMBIENT AIR QUALITY ATTAINMENT STATUS

Table 3.3-3 shows the federal and state attainment status for San Bernardino County. The region is nonattainment for federal ozone and PM_{2.5} standards, and nonattainment for state ozone and PM₁₀ and PM_{2.5} standards (CARB 2010c). In addition, the Valley Region is nonattainment for state nitrogen dioxide (NO_x) standards, and the Searles Valley region of the county (Trona vicinity) is nonattainment for state hydrogen sulfide standards (CARB 2010c).

Areas with air quality that exceed adopted air quality standards are designated as nonattainment areas for the relevant air pollutants. Areas that comply with air quality standards are designated as attainment areas for the relevant air pollutants. State Implementation Plans (SIPs) must be prepared by states for areas designated as federal nonattainment areas to demonstrate how the area will come into attainment of the exceeded federal ambient air quality standard.

As detailed in the Regulatory Framework discussion below, both CARB and USEPA have established air pollution standards in an effort to protect human health and welfare. Geographic areas are designated attainment if these standards are met and nonattainment if they are not met.

**TABLE 3.3-3
FEDERAL AND STATE AMBIENT AIR QUALITY ATTAINMENT STATUS FOR SAN BERNARDINO COUNTY**

Pollutant	Federal	State
1-hour Ozone (O ₃)	–	Nonattainment
8-hour Ozone (O ₃)	Nonattainment	Nonattainment
Coarse Particulate Matter (PM ₁₀)	Nonattainment	Nonattainment
Fine Particulate Matter (PM _{2.5})	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO ₂)	Attainment	Nonattainment in Valley Region
Sulfur Dioxide (SO ₂)	Attainment	Attainment
Hydrogen Sulfide (H ₂ S)	Attainment	Nonattainment in Searles Valley

Source: CARB 2010c

AIR POLLUTANTS OF CONCERN AND HEALTH EFFECTS

The most problematic pollutants in San Bernardino County include ozone and particulate matter. The health effects and major sources of these pollutants, as well as other key pollutants, are described below. Toxic air contaminants are a separate class of pollutants and are discussed later in this section.

Ozone

Ground-level ozone (O₃), commonly referred to as smog, is greatest on warm, windless, sunny days. O₃ is not emitted directly into the air, but is formed through a complex series of chemical reactions between reactive organic gases (ROG) and nitrogen oxides (NO_x). These reactions occur over time in the presence of sunlight. O₃ formation can occur in a matter of hours under ideal conditions. The time required for O₃ formation allows the reacting compounds to spread

over a large area, producing a regional pollution concern. Once formed, O₃ can remain in the atmosphere for one or two days.

Ozone is also a public health concern because it is a respiratory irritant that increases susceptibility to respiratory infections and diseases, and because it can harm lung tissue at high concentrations. In addition, O₃ can cause substantial damage to leaf tissues of crops and natural vegetation and can damage many natural and manmade materials by acting as a chemical oxidizing agent. The principal sources of the O₃ precursors (ROG and NO_x) are the combustion of fuels and the evaporation of solvents, paints, and fuels.

Particulate Matter

Particulate matter (PM) can be divided into several size fractions. Coarse particles (PM₁₀) are between 2.5 and 10 microns in diameter and arise primarily from natural processes, such as wind-blown dust or soil. Fine particles (PM_{2.5}) are less than 2.5 microns in diameter and are produced mostly from combustion or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces, and wood stoves produces fine particles.

The level of PM_{2.5} in the air is a public health concern because it can bypass the body's natural filtration system more easily than larger particles and can lodge deep in the lungs. The health effects vary depending on a variety of factors, including the type and size of particles. Research has demonstrated a correlation between high PM concentrations and increased mortality rates. Elevated particulate matter concentrations can also aggravate chronic respiratory illnesses such as bronchitis and asthma.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas that is formed by the incomplete combustion of fuels. Motor vehicle emissions are the dominant source of CO in the county. At high concentrations, CO reduces the oxygen-carrying capacity of the blood and can cause dizziness, headaches, unconsciousness, and even death. CO can also aggravate cardiovascular disease. Relatively low concentrations of CO can significantly affect the amount of oxygen in the bloodstream because CO binds to hemoglobin 220 to 245 times more strongly than oxygen.

CO emissions and ambient concentrations have decreased significantly in recent years. These improvements are due largely to the introduction of cleaner-burning motor vehicles and motor vehicle fuels. Carbon monoxide is still a pollutant that must be closely monitored, however, due to its severe effect on human health.

Elevated CO concentrations are usually localized and are often the result of a combination of high traffic volumes and traffic congestion. Elevated CO levels develop primarily during winter periods of light winds or calm conditions combined with the formation of ground-level temperature inversions. Wintertime carbon monoxide concentrations are higher because of reduced dispersion of vehicle emissions and because CO emission rates from motor vehicles increase as temperature decreases.

Nitrogen Dioxide

Nitrogen dioxide (NO₂) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO₂ are combustion devices such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Construction devices

3.3 AIR QUALITY

emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO₂. The combined emissions of NO and NO₂ are referred to as NO_x. Because NO₂ is formed and depleted by reactions associated with O₃, the NO₂ concentration in a particular geographic area may not be representative of the local NO_x emission sources.

Inhalation is the most common route of exposure to NO₂. Because NO₂ has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of adverse health effects depends primarily on the concentration inhaled rather than the duration of the exposure. Exposure can result in a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation. Symptoms that are more significant may include chemical pneumonitis or pulmonary edema with breathing abnormalities, cyanosis, chest pain, and rapid heartbeat.

Sulfur Dioxide

Sulfur dioxide (SO₂) is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with exposure to SO₂ pertain to the upper respiratory tract. SO₂ is a respiratory irritant, with constriction of the bronchioles occurring with inhalation of SO₂ at 5 ppm or more. On contact with the moist mucous membranes, sulfur dioxide produces sulfurous acid, which is a direct irritant. Similar to NO₂, the severity of adverse health effects depends primarily on the concentration inhaled rather than the duration of the exposure. Exposure to high concentrations of SO₂ may result in edema of the lungs or glottis and respiratory paralysis.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

3.3.2 REGULATORY FRAMEWORK

Air quality in San Bernardino County is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies primarily responsible for improving the air quality in the county are discussed below along with their individual responsibilities.

FEDERAL

U.S. Environmental Protection Agency

USEPA is responsible for enforcing the federal Clean Air Act and the 1990 amendments to it, as well as the national ambient air quality standards (federal standards) that USEPA establishes. These standards identify levels of air quality for six criteria pollutants, which are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The six criteria pollutants include O₃, CO, NO₂, SO₂, PM₁₀, and lead. USEPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf) and sources that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

As part of its enforcement responsibilities, USEPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs.

STATE

California Air Resources Board

CARB, a department of the California Environmental Protection Agency, oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating emissions from motor vehicles and consumer products within the state. CARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The amendments to the CCAA establish ambient air quality standards for the state (state standards) and a legal mandate to achieve these standards by the earliest practical date. These standards apply to the same six criteria pollutants as the federal CAA and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride. They are more stringent than the federal standards and, in the case of PM₁₀ and NO₂, far more stringent.

Senate Bill 656

In 2003, the California legislature enacted Senate Bill 656 to reduce public exposure to PM₁₀ and PM_{2.5}. CARB approved a list of the most readily available, feasible, and cost-effective control measures that can be employed by air districts to reduce PM₁₀ and PM_{2.5} (collectively referred to as PM) in 2004. The list is based on rules, regulations, and programs existing in California as of January 1, 2004, for stationary, area-wide, and mobile sources. In 2005, air districts adopted implementation schedules for selected measures from the list. The implementation schedules identify the appropriate subset of measures and the dates for final adoption, implementation, and the sequencing of selected control measures. In developing the implementation schedules, each air district prioritized measures based on the nature and severity of the PM problem in their area and cost-effectiveness. Consideration was also given to ongoing programs such as measures being adopted to meet national air quality standards or the state ozone planning process.

3.3 AIR QUALITY

LOCAL

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is the air quality regulating authority with jurisdiction over Orange County, the non-desert portions of Los Angeles, Riverside and San Bernardino counties, the Riverside County portions of the Salton Sea Air Basin, and the Mojave Desert Air Basin. The South Coast Air Basin is a subregion of SCAQMD's jurisdiction. SCAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs. Other responsibilities include monitoring air quality, preparing clean air plans, and responding to citizen complaints concerning air quality.

Mojave Desert Air Quality Management District

The Mojave Desert Air Quality Management District (MDAQMD) is the air quality regulating authority with jurisdiction over the desert portion of San Bernardino County, known as the Mojave Desert Air Basin (MDAB). The MDAB includes a portion of Kern County, Los Angeles County, Riverside County, and San Bernardino County. MDAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs. Other responsibilities include monitoring air quality, preparing clean air plans, and responding to citizen complaints concerning air quality.

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to reduce impacts to air quality. For instance, the General Plan regulates new development with grading restrictions and controls on the basis of soil types and dust-control measures during grading, heavy truck travel, and other dust-generating activities. The General Plan also requires the County to coordinate air quality improvement technologies with SCAQMD and MDAQMD to improve air quality through reductions in pollutants from the region. For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address air quality in the county. These policies are designed to guide future development in a way that lessens impacts to these features. These provisions are discussed in more detail in the impact discussions below.

San Bernardino Development Code

Division 3, Countywide Development Standards

Section 83.01.040 (Air Quality) of Chapter 83.01 (General Performance Standards) of the Development Code requires new development to obtain various permits from either SCAQMD or MDAQMD (depending on the location of the new development) relating to construction equipment and construction activities. In addition, Section 83.01.040 mandates emission control measures for all discretionary land use projects approved by the County. These measures primarily focus on off-road diesel construction vehicles and equipment (e.g., off-road vehicle/construction equipment idling regulations, ultra-low sulfur diesel fuel for stationary construction equipment requirements, and the provision of temporary traffic control during all phases of construction).

3.3.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of air quality impacts of the General Plan (San Bernardino County 2006, p. IV-27).

- 1) Conflict with or obstruct implementation of an applicable air quality plan.
- 2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- 3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
- 4) Expose sensitive receptors to substantial pollutant concentrations.
- 5) Create objectionable odors affecting a substantial number of people.

In addition, air quality impacts are considered to be significant if the following could result from the implementation of the proposed Project:

- 1) Result in significant construction-related air quality impacts.

The purpose of the GHG Plan is to reduce GHG emissions within the county. Therefore, as determined in the Initial Study prepared for the proposed Project, implementation of the proposed Project would not result in a increase severity of previously identified General Plan EIR air quality impacts associated with conflicting with or obstructing the implementation of the applicable air quality plans of the South Coast Air Quality Management District (SCAQMD) or Mojave Desert Air Quality Management District (MDAQMD); violate air quality standards; or contribute substantially to an existing or projected air quality violation or result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). This determination was made based on the notion that GHG reduction measures in the GHG Plan include several measures that would further assist in improving air quality (e.g., reduction measures such as the Anti-Idling Enforcement Policy (R2T1), the Expand Renewable Fuel/Low-Emission Vehicle Use policy (R2T5), and the policy related to current fleet turnover of County vehicles (R2F1a-INT)). These impacts will not be addressed further in this Draft SEIR.

In addition, the Initial Study prepared for the proposed Project determined that adverse impacts associated with carbon monoxide concentrations as well as impacts associated with increased odors were adequately addressed in previous environmental documents prepared for the County General Plan EIR and would not result in an increase in severity of these impacts.

In the case of carbon monoxide concentrations, the Initial Study also determined that San Bernardino County is located in an area with low background carbon monoxide concentrations and is in an attainment area for the carbon monoxide ambient standards. State protocol for carbon monoxide studies provides that within attainment areas for carbon monoxide, signalized intersections having a level of service (LOS) of E or F represent a potential CO violation and

3.3 AIR QUALITY

require further analysis. The project is not specifically proposing activities that would generate additional traffic trips, but instead provides traffic trip reduction measures identified in the GHG Plan. Therefore, this impact will not be further addressed in this Draft SEIR.

For impacts associated with increased odors, the Initial Study identified that the proposed Project is not expected to result in substantial odors for downwind receptors, as the General Plan EIR includes mitigation measures that will mitigate this impact. Air pollution control district nuisance regulations would ensure that any substantial releases of odors would be eliminated pursuant to enforcement actions.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant air quality impacts or a substantial increase in severity of previously identified air quality impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's three previously disclosed air quality impacts:

Impacts AQ-1, 2, and 3 – Growth anticipated under the updated General Plan will result in construction of new roads and infrastructure and increased urbanization of agricultural lands, resulting in higher air emissions. (San Bernardino County 2007c, p. 6)

As identified in the General Plan CEQA Findings, these impacts were identified as significant and unavoidable even with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 7). The following adopted General Plan policies and programs address air quality and are designed to guide future development in a way that lessens impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of the California Environmental Quality Act (CEQA) by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

- Policy CO 4.1 Because developments can add to the wind hazard (due to increased dust, the removal of wind breaks, and other factors), the County will require either as mitigation measures in the appropriate environmental analysis required by the County for the development proposal or as conditions of approval if no environmental document is required, that developments in areas identified as susceptible to wind hazards to address site-specific analysis of:
- a. Grading restrictions and/or controls on the basis of soil types, topography or season.
 - b. Landscaping methods, plant varieties, and scheduling to maximize successful revegetation.
 - c. Dust-control measures during grading, heavy truck travel, and other dust generating activities.

Policy CO 4.2 Coordinate air quality improvement technologies with the South Coast Air Quality Management District (SCAQMD) and the Mojave Air Quality Management District (MAQMD) to improve air quality through reductions in pollutants from the region.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts AQ-1, 2, and 3.

Given that the General Plan EIR did not directly address construction air quality impacts, a discussion of potential short-term, construction-related impacts is provided in this Draft SEIR. Quantifying the air quality impacts from short-term, temporary construction activities of the proposed Project is not possible due to project-level variability and uncertainties related to future individual projects.

Specific subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Therefore, this analysis uses a programmatic approach in evaluating possible air quality impacts of implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents). The analysis also considers recently prepared environmental review documents for renewable energy projects in the county (e.g., Kramer Junction Solar Energy Center Initial Study) to identify potential impacts unique to implementation of the GHG Plan reduction measures.

IMPACTS AND MITIGATION MEASURES

Short-Term Construction Emissions

Impact 3.3.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable impacts to air quality (General Plan EIR Impacts AQ-1, 2, and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not result in increased severity of these impacts. In addition, implementation of these General Plan and Development Code provisions would ensure that construction air pollutant emissions are addressed. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. There is no new or substantially more severe significant impact.**

The San Bernardino County General Plan EIR and General Plan CEQA Findings found that despite the imposition of certain mitigation measures, impacts to air quality from implementation of the General Plan cannot be fully mitigated to a level below significance. While the General Plan EIR did not have a separate impact discussion directly related to construction emissions, it

3.3 AIR QUALITY

was considered as part of air quality impacts identified in the impact discussions for AQ-1, AQ-2, and AQ-3 (San Bernardino County 2006, p. IV-28).

The quantity of daily emissions, particularly ROG and NO_x emissions, generated by construction equipment used to implement GHG reduction measures would depend on the number of vehicles used and the hours of operation. The significance of fugitive dust (PM₁₀) emissions would widely vary and would depend on the following factors: the aerial extent of disturbed soils and the length of disturbance time; whether or not existing structures are demolished; whether or not excavation is involved; and whether or not transport of excavated materials off site is necessary. The level of hydrocarbon emissions generated by oil-based substances such as asphalt is dependent on the type and amount of asphalt utilized. Quantifying the air quality impacts from short-term, temporary construction activities of the proposed Project is not possible due to project-level variability and uncertainties related to future individual projects.

Many of the GHG reduction measures, such as public transit expansion measures (R3T1), the expansion of the vanpool program (R2EC1-INT), the installation of solar photovoltaic systems on five County buildings (R2E8-INT), and increased use of combined heat and power systems (R1E6), are not expected to generate significant short-term impacts because they are minor upgrades to existing infrastructure and/or County programs. However, several other GHG reduction measures would involve grading and paving or the construction of permanent facilities. Although individual improvements may not generate significant short-term emissions, it is possible that several improvements would be under construction simultaneously in the county and would generate cumulative construction emissions that could impact air quality.

Tables 3.3-4 and **3.3-5** show the approximate level of construction-generated emissions that would result in a potentially significant impact for each pollutant of concern in the South Coast Air Basin and Mojave Desert Air Basin, respectively.

TABLE 3.3-4
THRESHOLDS OF SIGNIFICANCE FOR CONSTRUCTION OPERATIONS
IN THE SOUTH COAST AIR BASIN

Mass Daily Thresholds	
Pollutant	Construction
No _x	100 pounds/day
ROG	75 pounds/day
PM ₁₀	150 pounds/day
PM _{2.5}	55 pounds/day
So _x	150 pounds/day
CO	550 pounds/day
Lead	3 pounds/day

Source: SCAQMD 2009

**TABLE 3.3-5
THRESHOLDS OF SIGNIFICANCE FOR CONSTRUCTION OPERATIONS
IN THE MOJAVE DESERT AIR BASIN**

Mass Daily Thresholds	
Pollutant	Construction
NO _x	137 pounds/day
ROG	137 pounds/day
PM ₁₀	82 pounds/day
PM _{2.5}	82 pounds/day
SO _x	137 pounds/day
CO	548 pounds/day
Lead	3 pounds/day
Hydrogen Sulfide	54 pounds/day

Source: MDAQMD 2009

Implementation of the proposed Project would result in short-term emissions of diesel particulate matter (PM), which was identified as a toxic air contaminant (TAC)¹ by CARB in 1998. Construction of reduction measures would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities. The amount to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer. Cancer risk associated with exposure to TACs is typically based on calculations over a 70-year period of exposure. The use of diesel-powered construction equipment, however, would be temporary and episodic and would occur over a relatively large area. For these reasons, diesel PM generated by construction activities, in and of itself, would not be expected to create conditions where the probability of contracting cancer is greater than 10 in 1 million for nearby receptors. It should also be noted the diesel construction emissions are regulated by SCAQMD Rule 1401, New Source Review of Toxic Air Contaminants.

As previously mentioned, the quantification of air quality impacts from short-term, temporary construction activities of GHG reduction measures identified in the proposed Project is not possible due to project-level variability and uncertainties related to future individual projects. However, all construction projects can produce nuisance dust emissions. General Plan Policy CO 4.1 states that the County will require mitigation measures for developments in areas identified as susceptible to wind hazards to address site-specific analysis of (a) grading restrictions and/or controls on the basis of soil types, topography or season, (b) landscaping methods, plant varieties, and scheduling to maximize successful re-vegetation, and (c) dust-control measures during grading, heavy truck travel, and other dust-generating activities.

¹ In addition to the criteria pollutants, TACs are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. These levels are determined on a pollutant-by-pollutant basis. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust.

3.3 AIR QUALITY

Additionally, Section 83.01.040 (Air Quality) of the Development Code requires new development to obtain various permits from either SCAQMD or MDAQMD (depending on the location of the new development) relating to construction equipment and construction activities. These permit requirements make it possible to establish uniform performance standards regarding air pollutant emissions for development in the county. Air district performance standards are designed to mitigate the air quality impacts of proposed land uses. In addition, Section 83.01.040 of the Development Code mandates emission control measures for all discretionary land use projects approved by the County. These measures primarily focus on off-road diesel construction vehicles and equipment (e.g., off road vehicle/construction equipment idling regulations, ultra-low sulfur diesel fuel for stationary construction equipment requirements, and the provision of temporary traffic control during all phases of construction).

Furthermore, at the time of specific project-level environmental review, the lead agency will ensure compliance with mitigation measures, through placement of conditions of approval on applicable projects, to reduce impacts consistent with the General Plan and Development Code provisions. The proposed Project will not cause an increase in severity of the General Plan EIR air quality impacts. **Thus, there is no new or substantially more severe significant impact.**

3.4 BIOLOGICAL RESOURCES

3.4 BIOLOGICAL RESOURCES

This section describes the existing biological resources including the special-status species and sensitive habitats known to occur or that potentially occur in San Bernardino County, the regulations and programs that provide for their protection, and an assessment of the potential impacts of implementing the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). The existing setting and analysis in this section utilizes the County of San Bernardino 2007 General Plan and its associated Environmental Impact Report, as well as the County of San Bernardino Development Code.

3.4.1 EXISTING SETTING

San Bernardino County has been divided into three subregions for planning purposes: the Valley Region, the Mountain Region, and the Desert Region. These regions have distinctly different climates and geography, which in turn produce differing biological environments (San Bernardino County 2006, p. IV-37). It should be noted that these regions contain special-status plant and animal species (i.e., state and federal listed species under the state and federal endangered species acts, candidate species for future listing under the state and federal endangered species, species considered rare, and species otherwise protected under state and federal law).

VALLEY REGION

The elevation of the Valley Region of San Bernardino County generally ranges from 500 to 1,700 feet above sea level. The Yucaipa Hills, however, include land with an elevation of 5,400 feet. Soils include predominantly alluvial deposits with areas of dune sand. The Valley Region is urbanized with few existing natural open space areas. The predominant vegetation communities within the undeveloped areas of the valley are chaparral, coastal sage scrub, deciduous woodlands, grasslands, and wetlands (San Bernardino County 2006, p. IV-37).

Vegetation in urbanized areas consists primarily of introduced landscape species. **Table 3.4-1** shows native vegetation types associated with the various plant communities in the Valley Region.

**TABLE 3.4-1
NATIVE VEGETATION TYPES AND PLANT COMMUNITIES WITHIN THE VALLEY REGION**

Plant Communities	Vegetation Type
<i>Shrub</i>	
Chaparral	Chamise chaparral
	Semi-desert chaparral
	Mixed montane chaparral
	Ceanothus chaparral
	Scrub oak chaparral
Sage scrub	Riversidean alluvial fan sage scrub
	Riversidean sage scrub

3.4 BIOLOGICAL RESOURCES

Plant Communities	Vegetation Type
Woodland	
Riparian forest	Walnut woodland
	Willow riparian forest
	Cottonwood-willow riparian forest
	White alder riparian forest
Cismontane woodland	Black oak woodland
	Interior live oak woodland
	Coast live oak woodland
Wetland	
Meadow and seep	Freshwater seep
Marsh and swamp	Freshwater marsh
Riparian forest	Cottonwood-willow riparian forest
	Willow riparian forest
	White alder riparian forest
Riparian scrub	Mule fat scrub
	Southern willow scrub

Source: San Bernardino County 2006, p. IV-37

The most sensitive vegetation types found within the Valley Region are wetlands, including riparian woodland, riparian scrub, and freshwater marsh. Wetlands are considered a valuable but declining resource both locally and statewide. The dominant aquatic feature within the Valley Region is the Santa Ana River watershed. The upstream reaches are located in San Bernardino County. Key riverine resources in the area are Day Creek, Etiwanda Creek, Sevaime Creek, Lytle Creek, Cajon Wash, San Timoteo Wash, and Mill Creek (San Bernardino County 2006, p. IV-38). Invasive species such as giant reed (*Arundo donax*) and tamarisk (*Tamarix* sp.) are a problem for native flora and fauna in the drainages (San Bernardino County 2006, p. IV-38).

Other areas are important biologically because they support flora or fauna that are limited in their distribution or require or tolerate unusual conditions that occur there. For example, the alluvial sage scrub habitat in the Santa Ana River, Lytle Creek, and Cajon Wash has adapted to frequent flooding and therefore supports a unique diversity of plant species. Another sensitive plant community is the Riversidean alluvial fan sage scrub found on the alluvial fans at the base foothills of the San Bernardino Mountains, which has adapted to episodic flood. This habitat supports several sensitive species including San Bernardino kangaroo rat (*Dipodomys merriami parvus*), San Diego horned lizard (*Phrynosoma coronatum blainvillii*), Los Angeles pocket mouse (*Perognathus longimemris brevinasus*), and California bedstraw (*Galium californicum*) (San Bernardino County 2006, p. IV-38.)

MOUNTAIN REGION

The Mountain Region lies in the southwestern portion of the county and contains the San Bernardino Mountains and the eastern end of the San Gabriel Mountains. Both are elements of the Transverse Mountain Range of southern California. The San Bernardino Mountains cover approximately 652,000 acres, of which more than 248,000 acres are above 6,000 feet in

elevation (San Bernardino County 2006, p. IV-39). Elevations in the Mountain Region range from 2,000 feet in the foothills to 11,502 feet at the summit of Mount San Gorgonio (San Bernardino County 2006, p. IV-39). Soils vary in the Mountain Region, and the area is geologically active with faults and uplifting (San Bernardino County 2006, p. IV-39). Most of the region contains shallow soils consisting primarily of decomposed granite and sandy loam (San Bernardino County 2006, p. IV-39).

The major vegetation communities include shrubs, woodlands, wetlands (including scrub, marsh, and meadows), and the relic pavement plains. The County coordinates with the federal and state management plans in this region, as most of the Mountain Region is under the jurisdiction of federal or state agencies. Approximately 61 percent of the Mountain Region is managed by the U.S. Forest Service (USFS), while the Bureau of Land Management (BLM) manages 10 percent; the state owns 1 percent and 4 percent is Native American tribal land (San Bernardino County 2006, p. IV-39). **Table 3.4-2** shows vegetation types associated with the various communities in the Mountain Region.

The California Department of Fish and Game (CDFG) recognizes 14 Areas of Special Biological Importance (ASBIs) within the Mountain Region. Among the ASBIs are identified key areas that support herds of both resident and seasonally migratory mule deer (*Odocoileus hemionus*). These areas satisfy the year-round life requirements of resident deer herds and occur southwest of Luna Mountain, at Cleghorn Mountain, and east of Harrison Mountain. Good deer fawning areas, generally located near wet meadows and riparian thickets, occur from Manzanita Flat to Plunge Creek in the Alder Creek area and near Keller Meadows and the forks of Plunge Creek, east of Harrison Mountain. Deer winter ranges occur north of Barton Flats and summer ranges occur northwest of Delamar Mountain. Nelson bighorn sheep (*Ovis canadensis nelsoni*) habitat occurs throughout much of the Cucamonga Wilderness area and the North Slope of the San Bernardino Mountains, easterly of Deep Creek (San Bernardino County 2006, p. IV-39). However, the best habitat occurs in the San Gorgonio Mountain area.

**TABLE 3.4-2
NATIVE VEGETATION TYPES AND PLANT COMMUNITIES WITHIN THE MOUNTAIN REGION**

Plant Communities	Vegetation Type
Shrub	
Chaparral	Chamise chaparral
	Semi-desert chaparral
	Mixed montane chaparral
	Ceanothus chaparral
	Scrub oak chaparral
Sage scrub	Riversidean alluvial fan sage scrub
	Riversidean sage scrub
Woodland	
Riparian forest	Sycamore-oak riparian forest
Cismontane woodland	Black oak woodland
	Interior live oak woodland
	Coast live oak woodland

3.4 BIOLOGICAL RESOURCES

Plant Communities	Vegetation Type
Conifer woodland	
Interior closed-cone coniferous forest	Knobcone pine forest
Lower montane coniferous forest	Coulter pine forest
	Ponderosa pine forest
Upper montane coniferous forest	Jeffrey pine forest
	Jeffrey pine-fir forest
	White fir forest
	Lodgepole pine forest
Subalpine coniferous forest	Subalpine forest
Wetland	
Meadow and seep	Montane meadow
	Freshwater seep
Marsh and swamp	Freshwater marsh
Riparian forest	Coast live oak riparian forest
	Willow riparian forest
	Cottonwood-willow riparian forest
	White alder riparian forest
Riparian scrub	Mule fat scrub
	Southern willow scrub
Pebble or pavement plain	
Pavement plain community	Pavement plain
	Pebble plain

Source: San Bernardino County 2006, p. IV-40

CDFG also recognizes principal wintering area for waterfowl migrating along the Pacific Flyway. Within the Mountain Region, waterfowl have been observed at Baldwin Lake and Big Bear Lake. The lake areas also provide wintering habitat for the bald eagle, and both Lake Arrowhead and Big Bear Lake are therefore recognized by CDFG as Areas of Special Biological Importance (San Bernardino County 2006, p. IV-40).

Also within the Mountain Region, the U.S. Forest Service manages both the Cucamonga Wilderness Area (8,580 acres) and the San Geronio Wilderness Area (56,749 acres). The latter is the largest established wilderness area in southern California and one of the most publicly used in the nation (San Bernardino County 2006, p. IV-40). Aside from ASBIs, CDFG has an established ecological preserve at Baldwin Lake that totals 125 acres, and the Nature Conservancy has four preserves in the Mountain Region: Baldwin Lake Preserve, Castle Glen Bald Eagle Sanctuary, Sugarloaf Biota Bank, and Big Bear Valley Preserve. In addition to these designated acreages, other areas also recognized for the value of their resources, occur within the mountains, and remain important areas to be preserved. These areas include alkali wet meadow, pebble plains, limestone substrate, and wetlands (San Bernardino County 2006, p. IV-41).

The Mountain Region includes the headwater, upper reaches of the Santa Ana River watershed. Deep Creek and Bear Creek are CDFG-designated wild trout streams and contain high-quality riparian resources. Low-elevation riparian resources include cottonwood-willow, sycamore/coast live oak, and white alder communities. Locally rare riparian resources include the aspen groves in the San Bernardino Mountains. Invasive plant species are a problem in this area as well and include giant reed and tamarisk. Wildfires have occurred over the last ten years that currently, and will continue to, affect riparian resources in this region. Recent major fires include the Willows Fire (1999) around Deep Creek and the Grand Prix Fire and the Old Fire that burned almost the entire south-facing slopes of the San Bernardino Mountains and the easterly portion of the San Gabriel Mountains in 2003 (San Bernardino County 2006, p. IV-41).

DESERT REGION

Encompassing the great majority of San Bernardino County, approximately 93 percent of the county land area, the Desert Region includes a great diversity of biological resources in one of the most fragile ecosystems in the nation. The Desert Region includes land at elevations ranging from near sea level to desert valleys between 1,000 and 4,000 feet and mountain ranges exceeding 8,000 feet above sea level. Soils are predominantly sandy gravel with high runoff coefficients and fast percolation. The mountain ranges support exposed bedrock and mineral deposits in granite rock. Unique soil types include major dune formation, desert pavement, and dry alkaline lakebeds. The entire region is crossed by expansive alluvial wash deposits. The dominant habitat is desert scrub, but discrete areas of other habitat types also occur in this region. **Table 3.4-3** shows vegetation types associated with the various communities in the Desert Region. The general reference to the desert within the county can be divided into three main deserts—Mojave, Great Basin, and Colorado—and are differentiated by the respective biomes, rainfall patterns, and elevations (San Bernardino County 2006, p. IV-41).

**TABLE 3.4-3
NATIVE VEGETATION TYPES AND PLANT COMMUNITIES WITHIN THE DESERT REGION**

Plant Communities	Vegetation Type
<i>Shrub</i>	
<i>Sage scrub</i>	
Sage scrub	Riversidean sage scrub
	Riversidean alluvial fan sage scrub
<i>Mojave Desert scrub</i>	
Mojavean Desert scrub	Mojave creosote bush scrub
	Mojave mixed scrub
	Blackbush scrub
<i>Saltbush scrub</i>	
Chenopod scrub	Saltbush scrub
	Sink scrub
	Shadscale scrub

3.4 BIOLOGICAL RESOURCES

Plant Communities	Vegetation Type
Woodlands	
<i>White Fir woodland</i>	
<i>Pinyon and juniper woodland</i>	
Mojavean and juniper woodlands	Mojavean pinyon woodland
	Mojavean juniper woodland and scrub
<i>Joshua tree Woodland</i>	
Wetlands	
Meadow and seep	Freshwater seep
Marsh and swamp	Freshwater marsh
Riparian forest	Willow riparian forest
	Cottonwood-willow riparian forest
	White alder riparian forest
Riparian scrub	Mule fat scrub
	Southern willow scrub
Riparian woodland	Desert fan palm oasis woodland
	Southern riparian woodland
Alkali Sink	
Alkali meadows and seeps	Alkali playa
Sand Dune	
Desert dunes	Stabilized/partially stabilized dunes
	Sand fields

Source: San Bernardino County 2006, p. IV-42

Most of the Desert Region includes land managed by the BLM and other federal agencies including the National Park Service for the Mojave National Preserve and Joshua Tree National Park, as well as the U.S. military for Fort Irwin and other bases. The BLM, National Park Service, and CDFG recognize Areas of Special Biological Importance, Critical Habitat, and Desert Wildlife Management Areas within the region. The management of these areas is under the jurisdiction of the respective federal agencies (San Bernardino County 2006, p. IV-42).

The National Park Service controls two sites within the Desert Region of San Bernardino County:

- Joshua Tree National Park. In 1994, the Desert Protection Act designated 825,000 acres as a National Park. Two deserts, two large ecosystems whose characteristics are determined primarily by elevation, come together at Joshua Tree National Park. Below 3,000 feet, the Colorado Desert encompasses the eastern part of the park and features natural gardens of creosote bush, ocotillo, and cholla cactus. The higher, moister, and slightly cooler Mojave Desert is the special habitat of the Joshua tree. In addition to Joshua tree forests, the western part of the park also includes some of the most interesting geologic displays found in California's deserts. Five fan palm oases also dot the park, indicating those few areas where water occurs naturally.

- Mojave National Preserve. The Desert Protection Act created the 1.4-million-acre Mojave National Preserve in the heart of the Mojave Desert. The act transferred the lands known as the East Mojave National Scenic Area from the Bureau of Land Management to the National Park Service. The desert in the Mojave National Preserve ranges in elevation from less than 1,000 feet to almost 8,000 feet. Wildlife is abundant and over 300 different species of animals including desert bighorn sheep, mule deer, coyotes, and desert tortoises roam the area. Desert plants are especially adapted to living in this arid climate. Many have small leaves with waxy coverings to minimize moisture loss, while cacti store large volumes of water. Other plants, such as the creosote, have developed extensive or deep root systems that enable them to gather precious water. Common plants include yucca, creosote, and the Joshua tree (San Bernardino County 2006, p. IV-43).
- BLM has designated locations within three desert biomes as Areas of Critical Environmental Concern (ACEC) and Special Areas. By designating areas as ACEC, the Bureau of Land Management can develop special management programs for specific resources. These management programs are site-specific and include patrolling, fencing, and signage implemented by BLM. The programs also recommend actions that BLM does not have direct authority to implement. There are 13 designated biological ACECs in the Desert Region of San Bernardino County:
 - Fort Piute
 - New York Mountain
 - Dark Mountain
 - Amargosa River
 - Salt Creek
 - Cronese Lake
 - Fort Soda
 - Upper Johnson Valley
 - Soggy Dry Lake
 - North Harper Dry Lake
 - South Harper Dry Lake
 - Afton Canyon
 - Big Morongo Canyon (San Bernardino County 2006, p. IV-43)

Other areas that possess rare, unique, or unusual qualities of scientific, educational, cultural, or recreational significance may be designated as a Special Area. The goals of the Special Areas are to formally recognize significant natural areas on BLM lands, allow uses within the Special Areas compatible with the protection and enhancement of natural resources, and monitor the quality of the natural resources in relationship to allowed uses. The three Special Areas designated within the Desert Region are the Kelso Dunes, designated as a National Natural Landmark; the Granite Mountains, a Research Natural Area; and the East Mojave, designated as a National Scenic Area.

CDFG recognizes numerous ASBIs within the Desert Region of San Bernardino County that support various important biological resources, including, but are not limited to, areas of deer, bighorn sheep, and desert tortoise habitat.

The Desert Region supports a high number of sensitive plant species. Other sensitive wildlife occurring in the Desert Region includes locally sensitive populations of several species such as burrowing owl (*Athene cunicularia*) and Mojave ground squirrel (*Xerospermophilus mohavensis*). San Bernardino County contains a large area in which desert southwest playas are expected to occur. The following is a list of wetlands and riparian habitats found in the Desert Region:

3.4 BIOLOGICAL RESOURCES

- Alkali seeps, springs, and meadows
- Wetland and riparian plant communities
- Wetland and riparian wildlife
- Mojave River – Wild and Scenic River eligibility
- Invasive plant species

3.4.2 REGULATORY FRAMEWORK

This section lists specific environmental review and consultation requirements and identifies permits and approvals that must be obtained from local, state, and federal agencies before implementation of the proposed Project.

FEDERAL

Endangered Species Act

Provisions of the federal Endangered Species Act (ESA), as amended (16 USC 1531), protect federally listed threatened and endangered species and their habitats from unlawful take. "Take" under the ESA includes activities such as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." U.S. Fish and Wildlife Service (USFWS) regulations define harm to include some types of "significant habitat modification or degradation." In the case of *Babbitt, Secretary of Interior, et al., Petitioners v. Sweet Home Chapter of Communities for a Great Oregon, et al.* (No. 94-859), the United States Supreme Court ruled on June 29, 1995, that "harm" may include habitat modification "where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."

For projects with a federal nexus, Section 7 of the ESA requires that federal agencies, in consultation with USFWS, use its authority to further the purpose of the ESA and to ensure that its actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. Section 10(a)(1)(B) allows non-federal entities to obtain permits for incidental taking of threatened or endangered species through consultation with USFWS. Key provisions of the ESA are summarized below under the section that implements them.

Section 10

Section 10 of the ESA provides a means for non-federal entities (states, local agencies, and private parties) that are not permitted or funded by a federal agency to receive authorization to disturb, displace, or kill (i.e., take) threatened and endangered species. It allows USFWS to issue an incidental take permit authorizing take resulting from otherwise legal activities, as long as the take would not jeopardize the continued existence of the species. Section 10 requires the applicant to prepare a habitat conservation plan (HCP) addressing project impacts and proposing mitigation measures to compensate for those impacts. The HCP is subject to USFWS review and must be approved by the reviewing agency or agencies before the proposed Project can be initiated. Because the issuance of the incidental take permit is a federal action, USFWS must also comply with the requirements of the ESA Section 7 and the National Environmental Policy Act (NEPA).

Section 7

Section 7 of the ESA applies to the management of federal lands as well as other federal actions, such as federal approval of private activities through the issuance of federal permits, licenses, funding, or other actions that may affect listed species. Section 7 directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with USFWS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Critical habitat is defined as specific areas that are essential to the conservation of federally listed species.

Clean Water Act, Section 404

The objective of the Clean Water Act (CWA 1977, as amended) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Discharge of fill material into waters of the U.S., including wetlands, is regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the federal Clean Water Act (33 USC 1251–1376). USACE regulations implementing Section 404 define waters of the U.S. to include intrastate waters, including lakes, rivers, streams, wetlands, and natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce. Wetlands are defined for regulatory purposes as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3; 40 CFR 230.3). The jurisdictional boundaries for other waters of the U.S. are identified based on the presence of an ordinary high water mark (OHWM) as defined in 33 CFR 328.3(e). The placement of structures in “navigable waters of the U.S.” is also regulated by USACE under Section 10 of the federal Rivers and Harbors Act (33 USC 401 et seq.). Projects are permitted under either individual or general (e.g., nationwide) permits. Specific applicability of permit type is determined by USACE on a case-by-case basis.

In 1987, USACE published a manual that standardized the manner in which wetlands were to be delineated nationwide. To determine whether areas that appear to be wetlands are subject to USACE jurisdiction (jurisdictional wetlands), a wetlands delineation must be performed. Under normal circumstances, positive indicators from three parameters—(1) wetland hydrology, (2) hydrophytic vegetation, and (3) hydric soils—must be present to classify a feature as a jurisdictional wetland. More recently, USACE developed the Arid West Regional Supplement (USACE 2006) for identifying wetlands and distinguishing them from aquatic habitats and other nonwetlands. The supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. For any wetland delineations submitted after June 5, 2007, USACE is requiring that the site be surveyed according to both the 1987 manual and the supplement guidelines. In addition to verifying wetlands for potential jurisdiction, USACE is responsible for the issuance of permits for projects that propose filling of wetlands. Any permanent loss of a jurisdictional wetland as a result of project construction activities is considered a significant impact.

A “no net loss” wetlands policy is an overall policy goal for wetland protection first adopted by the George H. W. Bush Administration (1989–1993) and endorsed and updated by the Clinton Administration (1993–2001).

Clean Water Act, Section 401

Section 401 of the CWA requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a

3.4 BIOLOGICAL RESOURCES

certification that the discharge will comply with the applicable effluent limitations and water quality standards. The appropriate Regional Water Quality Control Board regulates Section 401 requirements (see under State).

Migratory Bird Treaty Act

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703–711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

Bald and Golden Eagle Protection Act

The bald eagle and golden eagle are federally protected under the Bald and Golden Eagle Protection Act (16 USC 668–668c). It is illegal to take, possess, sell, purchase, barter, offer to sell or purchase or barter, transport, export, or import at any time or in any manner a bald or golden eagle, alive or dead, or any part, nest or egg of these eagles unless authorized by the Secretary of the Interior. Violations are subject to fines and/or imprisonment for up to one year. Active nest sites are also protected from disturbance during the breeding season.

STATE

California Endangered Species Act

Under the California Endangered Species Act (CESA), CDFG has the responsibility for maintaining a list of endangered and threatened species (California Fish and Game Code 2070). CDFG maintains a list of “candidate species,” which are species that CDFG formally notices as being under review for addition to the list of endangered or threatened species. CDFG also maintains lists of “species of special concern,” which serve as species “watch lists.” Pursuant to the requirements of CESA, an agency reviewing a proposed Project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project site and determine whether the proposed Project will have a potentially significant impact on such species. In addition, CDFG encourages informal consultation on any proposed Project that may impact a candidate species.

Project-related impacts to species on the CESA endangered or threatened list would be considered significant. State-listed species are fully protected under the mandates of the CESA. “Take” of protected species incidental to otherwise lawful management activities may be authorized under California Fish and Game Code Section 206.591. Authorization from CDFG would be in the form of an Incidental Take Permit.

California Wetlands Conservation Policy

In August 1993, the Governor announced the California Wetlands Conservation Policy. The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.

- Reduce procedural complexity in the administration of state and federal wetlands conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporated the goals and objectives contained in the new policy and directed the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

California Regional Water Quality Control Board

Clean Water Act, Section 401 Water Quality Certification

Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards. The appropriate Regional Water Quality Control Board (in California) regulates Section 401 requirements. Three different Regional Water Quality Control Boards (RWQCB) cover San Bernardino County: Santa Ana Region, Lahontan Region, and Colorado River Region. These RWQCBs are responsible for controlling discharges to surface waters of the state by issuing waste discharge requirements (WDR) or commonly by issuing conditional waivers to WDRs.

Delegated Permit Authority

California has been delegated permit authority for the National Pollutant Discharge Elimination System (NPDES) permit program including stormwater permits for all areas except Indian lands. Issuing CWA Section 404 dredge and fill permits remains the responsibility of USACE, but the State actively uses its CWA Section 401 certification authority to ensure 404 permits protect state water quality standards.

State Definition of Covered Waters

Under California state law, "waters of the state" means "any surface water or groundwater, including saline waters, within the boundaries of the state." Therefore, water quality laws apply to both surface and groundwater. After the U.S. Supreme Court decision in *Solid Waste Agency of Northern Cook County v. Army COE of Engineers (SWANCC v. USCOE)*, the Office of Chief Counsel of the State Water Regional Control Board (SWRCB) released a legal memorandum confirming the State's jurisdiction over isolated wetlands. The memorandum stated that under the California Porter-Cologne Water Quality Control Act, discharges to wetlands and other waters of the state are subject to state regulation, and this includes isolated wetlands. In general, the RWQCBs regulate discharges to isolated waters in much the same way as they do for federal-jurisdictional waters, using Porter-Cologne rather than CWA authority.

California Fish and Game Code

Fully Protected Species

Certain species are considered fully protected, meaning that the code explicitly prohibits all take of individuals of these species except for take permitted for scientific research. Section 5050

3.4 BIOLOGICAL RESOURCES

lists fully protected amphibians and reptiles, Section 5515 lists fully protected fish, Section 3511 lists fully protected birds, and Section 4700 lists fully protected mammals.

It is possible for a species to be protected under the California Fish and Game Code, but not fully protected. For instance, mountain lion (*Puma concolor*) is protected under Section 4800 et seq., but is not a fully protected species.

Protection of Birds and Their Nests

Eggs and nests of all birds are protected under Section 3503 of the California Fish and Game Code, nesting birds (including raptors and passerines) under Sections 3503.5 and 3513, and birds of prey under Section 3503.5. Migratory non-game birds are protected under Section 3800 and other specified birds under Section 3505.

Stream and Lake Protection

CDFG has jurisdictional authority over streams and lakes and the wetland resources associated with these aquatic systems under California Fish and Game Code Sections 1600 et seq. through administration of lake or streambed alteration agreements. Such agreements are not a permit, but rather a mutual accord between CDFG and the project proponent. California Fish and Game Code Section 1600 et seq. was repealed and replaced in October of 2003 with the new Section 1600–1616 that took effect on January 1, 2004 (Senate Bill 418, Sher). Under the new code, CDFG has the authority to regulate work that will “substantially divert or obstruct the natural flow of, or 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 lake or stream.” CDFG enters into a streambed alteration agreement with the project proponent and can impose conditions in the agreement to minimize and mitigate impacts to fish and wildlife resources. Because CDFG includes under its jurisdiction streamside habitats that may not qualify as wetlands under the federal CWA definition, CDFG jurisdiction may be broader than USACE jurisdiction.

A project proponent must submit a notification of streambed alteration to CDFG before construction. The notification requires an application fee for streambed alteration agreements, with a specific fee schedule to be determined by CDFG. CDFG can enter into programmatic agreements that cover recurring operation and maintenance activities and regional plans. These agreements are sometimes referred to as Master Streambed Alteration Agreements (MSAAs).

LOCAL

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to guide future development in a way that reduces impacts to biological resources. For example, the General Plan states that in addition to conditions of approval that may be required for specific future development proposals, the County shall establish long-term comprehensive monitoring plans for the County's role in the protection of native species. In addition, the General Plan contains policy provisions that prohibit land conversion until adequate mitigation is provided to reduce impacts to less than significant in cases where a Mitigated Negative Declaration is used for California Environmental Quality Act (CEQA) compliance. For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan

policies and programs which address biological resources in the county. These policies are designed to guide future development in a way that lessens impacts to these features. These provisions are discussed in more detail in the impact discussions below.

San Bernardino County Community Plans

Fourteen community plans have been prepared for individual areas of the county. Community plans identify land use goals and policies unique to those areas. These plans, which became effective on April 12, 2007, have the primary purpose of guiding the future use and development of land within the community plan area in a manner that preserves the character and independent identity of the community. Community plans focus on a particular community within the overall area covered by the General Plan. As an integral part of the overall General Plan, the community plans are consistent with the General Plan.

San Bernardino Development Code

Division 2, Land Use Zoning Districts and Allowed Land Uses

Chapter 82.11 (Biotic Resources Overlay) of the Development Code implements General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats, which have been identified within unincorporated areas of the county. Biotic Resources Overlays are applied to areas that have been identified by a county, state, or federal agency as habitat for species of unique, rare, threatened, or endangered plants or animals or their habitats as listed in the General Plan. When a land use is proposed, or an existing land use is increased by more than 25 percent of disturbed area within a Biotic Resources Overlay, the land use application must include a biotic resources report, which identifies all biotic resources located on the site and those on adjacent parcels that could be impacted by the proposed development. The biotic resources report is also required to identify mitigation measures designed to reduce or eliminate impacts to the identified resources.

Division 8, Resource Management and Conservation

Chapter 88.01 (Plant Protection and Management) provides regulations and guidelines for the management of plant resources in the unincorporated areas of the county on property or combinations of property under private or public ownership. The intent of Chapter 88.01 is to promote plant life within the county through appropriate management techniques, conserve the native plant life heritage, regulate native plant and tree removal activity, protect and maintain local watersheds, and preserve habitats for rare, endangered, or threatened plants and to protect animals with limited or specialized habitats. Chapter 88.01 of the Development Code requires the issuance of a permit prior to the removal of regulated trees and plants.

3.4.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of impacts to biological resources of the General Plan (San Bernardino County 2006, p. IV-44):

- 1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

3.4 BIOLOGICAL RESOURCES

- 2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- 3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- 4) 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.
- 5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- 6) 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 analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects From Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant impacts to biological resources or a substantial increase in severity of previously identified impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's 18 previously disclosed impacts to biological resources:

Impacts BIO-4, 5, 6, 7, 10, 11, 12, 15, 17, and 18 – Implementation of the General Plan Update will have the potential to impact sensitive or special-status plant and animal species in certain regions of the County; movement of native resident or migratory fish or wildlife species in certain regions; federally protected wetlands in certain regions; and to conflict with local policies or ordinances protecting biological resources, including Habitat Conservation Plans. (San Bernardino County 2007c, p. 8)

As identified in the General Plan CEQA Findings, mitigation measures have been incorporated to reduce potential impacts to biological resources from Impacts BIO-4, 5, 6, 7, 10, 11, 12, 15, 17, and 18 to less than significant (San Bernardino County 2007c, p. 9).

Impacts BIO-1, 2, 3, 8, 9, 13, 14, and 16 – Implementation of the General Plan Update will have impacts on candidate, sensitive or special status plant and animal species in certain regions; movement of native resident or migratory fish or wildlife species in certain regions; federally protected wetlands in certain regions; and riparian habitat or other sensitive natural communities in all regions. (San Bernardino County 2007c, p. 8)

As identified in the General Plan CEQA Findings, these impacts were identified as significant and unavoidable even with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 9).

The following adopted General Plan policies and programs address biological resources and are designed to guide future development in a way that lessens impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in General Plan EIR directly into the General Plan as policies.

- Policy CO 1.2 The preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. The County will continue the review of the Land Use Designations for unincorporated areas within one mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas.
- CO 1.2 Program 1 The County shall coordinate with state and federal agencies for the identification of buffering techniques and the creation of mitigation banks for sensitive species within the Valley, Mountain, and Desert Regions. The County shall work with local governments to conserve critical habitat and minimize recreational use in sensitive areas supporting local, state, or federally protected species. As feasible, the County shall work with the Army Corps of Engineers (ACOE), U.S. Fish and Wildlife Service, and California Department of Fish and Game (CDFG) to establish mitigation banks or conservation easements for unincorporated areas supporting local, state, or federally protected species as a better long-term solution to habitat fragmentation and piece-meal mitigation.
- CO 1.2 Program 2 The County will coordinate with appropriate agencies (e.g., USFWS, California Natural Diversity Data Base, BLM, National Park Service, California Native Plant Society, and so forth) and interested groups (e.g., Audubon Society, San Bernardino County Museum) to develop, fund and implement a geographic information and web-based database system for identifying important biological resources and natural open space areas within the Valley, Mountain, and Desert Regions of the County. The implementation of the aforementioned geographic information and database system is a commitment to update and enhance the Biological and Open Space Overlays within a specific area prior to approval of any subsequent development plans. This program includes the maintenance of the web-based database with completed Biological Opinions that will contribute to the evaluation of cumulative impacts from previously approved projects. Furthermore, the County shall quarterly fund the San Bernardino County Museum (Museum) to review and update the Biological Resources and Open Space Overlays to facilitate an accurate and current spatial data based on local, state, and federally protected species and their habitats.

3.4 BIOLOGICAL RESOURCES

- CO 1.2 Program 3 The County shall coordinate with local, state, and federal agencies to create a specific and detailed wildlife corridor map for the County of San Bernardino. The map will identify movement corridors and refuge area for large mammal, migratory species, and desert species dependent on transitory resource based on rainfall. The wildlife corridor and refuge area map will be used for preparation of biological assessments prior to permitting land use conversion within County jurisdictional areas. The mapping will be included in the Open Space and Biological Resource Overlays.
- CO 1.2 Program 4 The County shall coordinate with state and federal agencies and departments to ensure that their programs to preserve rare and endangered species and protect areas of special habitat value, as well as conserve populations and habitats of commonly occurring species, are reflected in reviews and approvals of development programs. This coordination shall be accomplished by notification of development applications and through distributed CEQA documents.
- Policy CO 2.1 The County will coordinate with state and federal agencies and departments to ensure that their programs to preserve rare and endangered species and protect areas of special habitat value, as well as conserve populations and habitats of commonly occurring species, are reflected in reviews and approvals of development programs.
- Policy CO 2.3 In addition to conditions of approval that may be required for specific future development proposals, the County shall establish long-term comprehensive plans for the County's role in the protection of native species because preservation and conservation of biological resources are statewide, regional, and local issues that directly affect development rights. The conditions of approval of any land use application approved with the BR overlay district shall incorporate the mitigation measures identified in the report required by Section 82.13.030 (Application Requirements), to protect and preserve the habitats of the identified plants and/or animals.
- CO 2.3 Program 1 Prepare or participate in Habitat Conservation Plans when there is sufficient support of such plans, and adequate funding for their preparation, and a strong likelihood of success.
- CO 2.3 Program 2 Establish a land ownership transfer program.
- CO 2.3 Program 3 Establish a land conservation easement program.
- CO 2.3 Program 4 The County shall work with local communities to improve trash collection, recycling programs, and reduce illegal dumping in unincorporated areas. The County shall sponsor mitigation efforts that minimize landfill growth, reduce trash haul routes that spread litter and increase predator species numbers (i.e., raven or crow in the Desert Region), and reduce illegal dumping of large bulk items (e.g., furniture, appliances, tires, batteries).

- CO 2.3 Program 5 The County shall participate with Regional plans to improve water quality and habitat that are downstream but may be beyond County limits. The County shall coordinate with Regional plans to minimize degradation of water quality within the County that affects downstream resources and habitats.
- Policy CO 2.4 All discretionary approvals requiring mitigation measures for impacts to biological resources will include the condition that the mitigation measures be monitored and modified, if necessary, unless a finding is made that such monitoring is not feasible.
- CO 2.4 Program 1 The monitoring program will be designed to determine whether the mitigation measures were implemented and effective.
- CO 2.4 Program 2 The monitoring program will be funded by the project applicant to ensure compliance with and effectiveness of conditions of approval.
- CO 2.4 Program 3 The County shall not permit land conversion until adequate mitigation is provided to reduce impacts to less than significant in cases where a Mitigated Negative Declaration is used for CEQA compliance. Direct and growth inducing impacts determined to cause a significant adverse effect on rare, threatened or endangered desert species shall be mitigated by avoidance, habitat restoration or compensated by off-site mitigation and evaluated through a project level EIR. Mitigation will be required for adverse impacts to critical areas around residential land conversion when it can be shown that the indirect effects of pets, associate human activity and other encroachments into sensitive habitats will be significant.
- CO 2.4 Program 4 The County shall require all new roadways, roadway expansion, and utility installation within the wildlife corridors identified in the Open Space and Biological Resource Overlays to provide suitable wildlife crossings for affected wildlife. Design will include measures to reduce or prevent habitat fragmentation and provide wildlife a means of safe egress through respective foraging and breeding habitats. A qualified biologist will assist with the design and implementation of wildlife crossing including culverts, overcrossings, undercrossings, and fencing.
- Policy CO 5.4 Drainage courses will be kept in their natural condition to the greatest extent feasible to retain habitat, allow some recharge of groundwater basins and resultant savings. The feasibility of retaining features of existing drainage courses will be determined by evaluating the engineering feasibility and overall costs of the improvements to the drainage courses balanced with the extent of the retention of existing habitat and recharge potential.
- Policy M/CO 1.7 Encourage conservation and sound management of the mountain forest character and natural resources, including water, streams, vegetation, soils and wildlife. Require the planting of native or drought-tolerant cultivar species, capable of surviving the mountain environment and climate.

3.4 BIOLOGICAL RESOURCES

- Policy M/CO 3.6 Minimize the runoff of surface water and establish controls for soil erosion and sedimentation through the following policies:
- a. Through the development review process, require replanting of ground cover in denuded areas with revegetation, either indigenous to the area or compatible with the climate and soil characteristics of the region.
 - b. When development occurs, provide for the retention of natural drainage channels and capacity of the site where feasible.
 - c. When feasible, require developers, through the development review process, to maintain existing percolation and surface water runoff rate by discouraging the paving of large surface areas.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact to biological resources not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts BIO-1 through 18.

Specific subsequent projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible impacts to biological resources from implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents). In addition, the analysis also considers recently prepared environmental review documents for renewable energy projects in the county (e.g., Granite Mountain Wind Energy Project Draft EIS/EIR and Kramer Junction Solar Energy Center Initial Study) to identify potential impacts unique to implementation of the GHG Plan reduction measures.

IMPACTS AND MITIGATION MEASURES

Natural Habitat Areas/Sensitive Species/Wildlife Corridors

Impact 3.4.1 The General Plan EIR and the General Plan CEQA Findings found that, despite the imposition of certain mitigation measures, impacts to some sensitive and special-status species and their associated habitat and migratory corridors resulting from implementation of the 2007 General Plan cannot be fully mitigated to a level below significance (General Plan EIR Impacts BIO-1, 2, 3, 8, 9, 13, 14, and 16). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would generally ensure that implementation of the proposed Project does not result in an increased severity of these impacts. However, subsequent implementation of the GHG Plan reduction measures that provide for renewable energy generating facilities could result in increased severity of biological resource impacts than was considered in the General Plan EIR. **Thus the proposed Project would substantially increase the severity of this impact, which was previously identified in the General Plan EIR as a significant and**

unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.

In general, the GHG reduction measures envisioned as part of the proposed Project involve expansion of existing facilities in urbanized or already developed areas, and/or within existing rights-of-way, rather than extension of infrastructure into undeveloped portions of the county. Therefore, most contemplated improvements would not be expected to adversely affect important biological habitats. However, GHG reduction measures, such as the implementation of vehicle miles traveled reduction strategies (R2T2), the promotion of bicycle and pedestrian infrastructure (R2T7), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4), could permanently alter natural areas, remove trees and vegetation, and affect federal, state, and locally protected habitats and/or species. In addition, such projects could create barriers to wildlife movement in identified wildlife corridors, including creek channels. However, these impacts were programmatically considered in the General Plan EIR.

Some GHG reduction measures could increase human activity in areas where significant biological resources could occur. For example, bikeway and pedestrian projects (R2T7) could increase human activity in the vicinity of riparian areas and other potentially sensitive habitats. Similar impacts could be associated with the encroachment of transmissions lines (R3E9) due to maintenance needs. Although the proposed road improvements cited above would not necessarily create significant impacts to biological resources, the introduction of more human activity into potentially sensitive areas could increase the potential for conflicts with sensitive plant and wildlife species. The General Plan contains Policy CO 2.3, which states that in addition to conditions of approval that may be required for specific future development proposals, the County shall establish long-term comprehensive monitoring plans for the County's role in the protection of native species.

Implementation of reduction measures R3E9 through R3E14 could involve installation of wind generators and other renewable energy facilities that have the potential to impact sensitive and special-status species in unique ways compared with other development not anticipated or evaluated in the General Plan EIR. Wildlife may be potentially affected by certain GHG reduction measures through:

- Electrocutation from transmission lines;
- Noise;
- Presence of, or collision with, turbines, meteorological towers, and transmission lines;
- Maintenance activities;
- Special-status avian and bat strikes from wind-generating facilities
- Exposure to contaminants; and
- Increased potential for fire hazards.

In some instances, turbines, transmission lines, and other facility structures may interfere with behavioral activities, including migratory movements, and may provide additional perch sites for raptors, thereby increasing predatory levels on other wildlife (i.e., predation of juvenile desert tortoises by ravens). Additionally, with the development of wind power generating facilities,

3.4 BIOLOGICAL RESOURCES

there is a potential for impacts to special-status birds, raptors, and bats due to collision with wind turbines and barotraumas (in bats).

As discussed above, subsequent GHG reduction measures implemented as a result of the proposed Project would be considered pursuant to CEQA on a case-by-case basis following submittal of a specific development proposal. The significance of potential impacts would be addressed through site-specific studies as individual projects are developed. In addition, Policy CO 2.4 states that all discretionary approvals requiring mitigation measures for impacts to biological resources will include the condition that the mitigation measures be monitored and modified, if necessary. CO 2.4 Program 3 states that the County shall not permit land conversion until adequate mitigation is provided to reduce impacts to less than significant in cases where a Mitigated Negative Declaration is used for CEQA compliance, and impacts determined to cause a significant adverse effect on rare, threatened, or endangered desert species must be mitigated by avoidance, habitat restoration, or compensated by off-site mitigation and evaluated through a project-level EIR.

Chapter 88.01 of the Development Code requires the issuance of a permit prior to the removal of regulated trees and plants, which includes native species, thereby reducing the threat to sensitive plant species or areas of biologically valuable vegetation. Sensitive habitats in the county are able to be protected through stipulations of Chapter 82.11 (Biotic Resources Overlay) of the Development Code, which implements General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats. Biotic Resources Overlays are applied to areas that have been identified by a county, state, or federal agency as habitat for species of unique, rare, threatened, or endangered plants or animals or their habitats as listed in the General Plan.

The General Plan would require that individual GHG reduction measures associated with the proposed Project would also be required to address and mitigate special-status species and habitat impacts. Moreover, regulatory provisions such as Policy CO 2.3 and Policy CO 2.4 and CO 2.4 Program 3 are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document for Renewable Electricity Standard (CARB 2010f), which addresses impacts resulting from future renewable electricity standard projects (i.e., alternative energy generation projects). This functional equivalent document identified project footprint minimization measures, as well as the provision to perform periodic biological monitoring of implemented biological resource impact mitigation measures.

As noted above, implementation of the General Plan policies and Development Code would largely address the additional biological resource impacts of the GHG Plan reduction measures associated with the proposed Project. However, impacts from the further promotion of renewable energy generating facilities would have a substantial increased severity of impacts. Because the County has some jurisdiction on transmission lines from energy facilities to their tie-in to the grid (the County does not have jurisdiction on transmission lines on State and Federal land), the following mitigation measures would assist in mitigating the additional impacts associated with renewable energy generating facilities.

Mitigation Measures

MM 3.4.1a Development Code Chapter 84.29 (Renewable Energy Generation Facilities) shall be amended to include the following standard for transmission line design:

- Transmission lines and all electrical components shall be designed, installed, and maintained to reduce the likelihood of large bird electrocutions and collisions and each line will be evaluated for potential collision risks.

MM 3.4.1b Development Code Chapter 84.29.030 (Wind Energy Development standards) shall be amended to include the following standards:

- The design of wind energy facilities will discourage the use of the site by avian species (provision of landscaping and ground conditions that are unattractive to avian species).
- Design and siting of wind turbines associated with lighting, avoidance placement of turbines on or immediately adjacent to the upwind side of ridge crests, and other design features to minimize impacts to bat and avian species.
- Provision of an avian and bat management plan that includes mortality monitoring and additional measures to address unanticipated significant adverse impacts on the population of avian or bat species or with any migratory corridor.

Implementation of mitigation measure MM 3.4.1a would ensure that bird electrocutions and collisions with transmission lines are addressed in a manner consistent with the Avian Power Line Interaction Committee's Suggested Practices for Avian Protection on Power Lines and Mitigating Bird Collisions with Power Lines. Mitigation measure MM 3.4.1b would establish development standards to address potential impacts to bats and to raptors and other bird species. Compliance with the above mitigation measures (in combination with General Plan policy and Development Code provisions) would reduce potential impacts to special-status species and impacts to avian and bat species on a project-by-project basis. However, impacts from the further promotion of renewable energy generating facilities would have a substantial increased severity of impacts and may not be able to be avoided in all cases. **Thus the proposed Project results in a substantial increase in the severity of this impact. This substantial increase that would result from the proposed Project is a significant and unavoidable impact.**

Wetland/Riparian Habitats

Impact 3.4.2 The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, impacts to wetland and riparian habitat in some areas of the county resulting from implementation of the 2007 General Plan cannot be fully mitigated to a level below significance (General Plan EIR Impacts BIO-2, 3, 8, 9, 4, and 16). While construction activity associated with implementation of the proposed Project may temporarily disturb wetland or riparian habitats and/or other biological resources, implementation of General Plan policy provisions and the continued enforcement of the County Development Code would generally ensure that implementation of the proposed Project would not result in increased severity of these impacts. The proposed Project would not result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. There is no new or substantially more severe significant impact.**

3.4 BIOLOGICAL RESOURCES

In general, the GHG reduction measures that are part of the proposed Project involve expansion of existing facilities in urbanized or already developed areas, and/or within existing rights-of-way, rather than extension of infrastructure into undeveloped portions of the county. Therefore, most contemplated improvements would not be expected to adversely affect important biological habitats, such as wetlands and riparian areas. However, there is the potential that certain future GHG reduction measures would involve the development of bicycle paths or traffic efficiency improvements along riparian corridors and/or in wetland areas, such as those associated with the Mojave River. Construction of these facilities could have both direct impacts due to disturbance of riparian and/or wetland flora and fauna and indirect impacts due to increased erosion and sedimentation, which would adversely affect downstream water quality. Such disturbance would also have the potential to adversely affect species that inhabit these types of areas, including various amphibians, songbirds, fish, and raptors. Projects in the vicinity of riparian and/or wetland areas would generally need site-specific review to definitively determine the extent of impacts and types of mitigation necessary.

Additionally, a number of regulatory mechanisms, as discussed in the Regulatory Framework section above, address various types of construction-related impacts to wetlands. Disturbance within any water of the U.S. would require a Section 404 permit from the U.S. Army Corps of Engineers, which would place certain requirements for avoidance or replacement of lost wetland habitat. When a project would alter the natural flow or bed, channel, or bank of any river, stream, or lake, a Section 1601 streambed alteration agreement would need to be obtained from the California Department of Fish and Game. Like the 404 permit, this agreement would be expected to include measures that alleviate impacts to riparian habitats. Preparation and implementation of the stormwater pollution prevention plans (SWPPPs) required under Section 401 of the Clean Water Act would alleviate potential indirect impacts relating to increased erosion, sedimentation, and runoff.

General Plan Policy M/CO 1.7 encourages conservation and sound management of natural resources in the Mountain Region of the county, including water, streams, and vegetation, through the requirement of planting native or drought-tolerant cultivar species capable of surviving the mountain environment and climate. Policy M/CO 3.6 mandates the minimization of construction site runoff to surface water and establishes controls for soil erosion and sedimentation in the Mountain Region through (a) the requirement of replanting ground cover in denuded areas with re-vegetation, either indigenous to the area or compatible with the climate and soil characteristics of the region, during the development review process; (b) the provision that when development occurs, natural drainage channels are retained where feasible; and (c) the requirement that developers, through the development review process, maintain existing percolation and surface water runoff rate by discouraging the paving of large surface areas.

Furthermore, and as discussed under Impact 3.4.1, subsequent GHG reduction measures implemented as a result of the proposed Project would still be required to be considered pursuant to CEQA on a case-by-case basis following submittal of a specific development proposal. As specific reduction measure projects are proposed, the significance of potential impacts would need to be addressed on a case-by-case basis through site-specific studies as the individual projects are developed. General Plan Policy CO 2.4 requires that all discretionary approvals requiring mitigation measures for impacts to biological resources, including riparian habitat and wetland areas, include the condition that the mitigation measures be monitored and modified, if necessary. CO 2.4 Program 3 states that the County will not permit land conversion until adequate mitigation is provided to reduce biological impacts to less than significant in cases where a Mitigated Negative Declaration is used for CEQA compliance.

Direct and growth-inducing impacts determined to cause a significant adverse effect on rare, threatened, or endangered desert species, many of which exist in riparian and/or wetland habitats, shall be mitigated by avoidance, habitat restoration, or compensated by off-site mitigation and evaluated through a project-level EIR. These regulatory provisions are consistent with recognized mitigation measures highlighted in the California Air Resources Board's Functional Equivalent Document for Renewable Electricity Standard (CARB 2010f), which addresses impacts resulting from future renewable electricity standard projects. The proposed Project would be subject to these County provisions. Therefore, through the implementation of the aforementioned policies, implementation of the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Habitat Conservation Plans

Impact 3.4.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding the potential to conflict with any habitat conservation plans due to the imposition of mitigation measures (General Plan EIR Impacts BIO-5, 6, 12, 17, and 18). Implementation of General Plan policy provisions would ensure that implementation of the proposed Project would not result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

The County took a lead role in the preparation of a Multi-Species Habitat Conservation Plan (MSHCP) for the San Bernardino Valley in 1995. Other habitat conservation plans within the boundaries of San Bernardino County include, but are not limited to those listed below (San Bernardino County 2006, p. IV-103).

- Participation in West Mojave Plan (largest HCP in country)
- Upper Santa Ana Wash
- Angelus Block
- Highlands Roadway Project
- Cushenbery Sand and Gravel
- High Desert Power Project
- Reichel
- SCE/Etiwanda and Mira Loma Corridor
- Sunland Communications
- Vulcan Material (aka Calmat) Cajon Creek
- Delhi-Sands Flower Loving Fly

3.4 BIOLOGICAL RESOURCES

GHG reduction measures implemented as a result of the proposed Project would involve actions that may be subject to habitat conservation plan requirements and/or may occur adjacent to or within areas subject to habitat conservation plans. For example, a GHG reduction measure implementation project located in an area within the regulatory jurisdiction of a habitat conservation plan would be required to implement all applicable mitigation and pay any additional fees as outlined in the HCP. This would occur after a project-specific environmental review considers specific mitigation measures and/or alternative alignments needed to avoid or minimize conflicts with the habitat conservation plan and the protected species and habitats within the plan.

In order to mitigate adverse effects of development on biological resources, the General Plan relies on the development of habitat conservation plans and mitigation sites for the County to participate in (San Bernardino County 2006, p. IV-48). For example, Policy CO 2.3 states that in addition to conditions of approval that may be required for specific future development proposals, the County will establish long-term comprehensive plans [such as habitat conservation plans or natural community conservation plans] for the County's role in the protection of native species. CO 2.3 Program 1 requires the County to prepare or participate in habitat conservation plans when there is sufficient support of such plans, adequate funding for their preparation, and a strong likelihood of success.

The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding the potential to conflict with any habitat conservation plans. The proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not result in a new impact that was not addressed in General Plan EIR. There would be no new impacts associated with the implementation of the proposed Project. **Thus, there is no new or substantially more severe significant impact.**

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section evaluates the potential impacts of the proposed General Plan Amendment, San Bernardino County Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (proposed project) on historical, cultural, and paleontological resources. Cultural resources are defined as prehistoric and historic sites, structures, and districts or any other physical evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, or religious reasons. Paleontological resources include fossil remains, as well as fossil localities and formations which have produced fossil material. Existing setting and analysis in this section utilizes the 2007 San Bernardino County General Plan (General Plan) and its associated EIR and the County of San Bernardino Development Code.

3.5.1 EXISTING SETTING

Cultural resources contribute to an understanding of past human activities, including Native American history, local and regional European, African and Asian settlement in North America, urban development, historic engineering activities, cross-cultural influences, and human adaptations to the environment. Cultural resources, like many natural resources found on our planet, are nonrenewable. Once these resources have been destroyed, by whatever means, a fragment of history permanently disappears.

The archaeological sites of the Prehistoric period, the period before European arrival in the New World, may include the remains of Native American villages and campsites, food processing locations, areas for exploiting local floral and faunal resources, lithic resource procurement and stone tool production locations, and burial and cremation areas. They may also consist of trails, rock art and ground figures (geoglyphs), isolated artifacts, and sacred locations. Historic archaeological resources, on the other hand, derive from various periods after initial European contact, during which written European histories, to varying extents, occurred. Resources from this period include refuse deposits such as can and bottle dumps, filled-in privy pits and cisterns, melted adobe walls and foundations, collapsed structures and associated features, and roads and trails. They may be related to mission activities, travel and exploration, early settlement, homestead activities, cattle herding, lumbering, and mining, among other themes. In San Bernardino County, historic, archaeological resources date from the earliest Spanish mission activities (1770) to the mid 20th Century (1950) (San Bernardino County, 2006 at page IV-57). This class of resources, often related to a historic archaeological resource, includes structures of any type that are 50 years or more in age. This resource category often referred to as the "built environment," comprises houses or other structures, irrigation works, bridges, dams, and other 'built' historic engineering features (San Bernardino County, 2006 at page IV-57).

As the largest County in the lower 48 states, San Bernardino County comprises three main ecological zones: valley, mountain, and desert. These differing zones are responsible for the many unique prehistoric and historic cultures that have developed over the past approximate 10,000 years of human occupation within the County (San Bernardino County, 2006 at page IV-57). Californian archaeologists have generally divided the prehistoric occupation of southern California into three broad categories:

- The Paleo-Indian Period: the earliest inhabitants within the County and dating from approximately 10,000 years before present to 8,000 before present. Within this tradition, there may have developed two sub-cultures: Pluvial Lake, where interior lake ecosystems were exploited (this area is now the Mojave Desert), and Coastal, where people relied extensively on the littoral ecozone;

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

- The Archaic Period: is distinguished by a dramatic change in the climate (also defined as the division between Pleistocene to Holocene geologic periods) where the western pluvial lakes dried, possibly resulted in an increased population along the littoral zone from approximately 8,000 years before present to 4,000 years before present; and
- The Late Prehistoric: is characterized by semi-nomadism, the development of small village complexes and the early advent of agriculture from approximately 4,000 years before present to European contact (18th century). (San Bernardino County, 2006 at page IV-57 through IV-58.)

The information on the occupants of San Bernardino County during the Protohistoric period, the period just before European contact, is largely based on ethnographic writings of Spanish missionaries, who sought to establish groupings of people more for their own purposes of converting Native Americans to Catholicism (San Bernardino County, 2006 at page IV-58). Trending from the Pacific Ocean to the Colorado River, these Native American groups comprise the Gabrielino, Luiseno, Kitanemuk, Cahuilla, Serrano, Vanume, Kawaiisu, Panamint Shoshone, Southern Paiute, Mojave, and Haichidhoma (San Bernardino County, 2006 at page IV-58). Based upon the writings of Spanish missionaries, the ethnographic inhabitants of San Bernardino County were Numic- and Takic-speaking populations. Exceptions are the Mojave and Haichidhoma people along the Colorado River who are Yuman-speaking.

The historic period in San Bernardino County began with the Spanish occupation and construction of the Mission San Gabriel Arcangel, located northeast of present day Los Angeles (San Bernardino County, 2006 at page IV-58). The Mexican Period (A.D. 1821 to 1848), the period marked by the Mexican-American independence from Spain, follows the Spanish Period. In 1846, the United States declared war on Mexico. After two years, Mexico signed the Treaty of Guadalupe Hidalgo thereby relinquishing the area that would become the modern southwestern states of Texas, New Mexico, Arizona, and California. The American Period began in 1848 and continues to the present.

Each of these cultural periods has produced rich material inventories and complex social organizations that have left behind important and non-replaceable cultural resources. These resources are represented in the cultural resources files stored at the San Bernardino Archaeological Information Center (AIC), the California Historical Resources System for the County of San Bernardino. Currently, the AIC has information on more than 12,000 prehistoric and historic archaeological sites and 4,700 isolates (archaeological sites with three or fewer artifacts) (San Bernardino County, 2006 at page IV-58). Approximately 5,000 historic buildings or structures in the County are eligible or already listed in the California Register of Historical Resources (San Bernardino County, 2006 at page IV-58). There are an additional 40 California Historical Landmarks located within the County and 53 properties listed in the National Register of Historic Places (San Bernardino County, 2006 at page IV-58).

In addition to the traditional cultural resources associated with archaeological sites and historic buildings and structures, traditional cultural properties (TCPs) must also be taken into consideration. TCPs are "a traditional cultural property...that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community." Typically, TCPs are associated with the Native American community because of their spiritual relationship with landscapes. However, because TCPs are viewed as sacrosanct, many tribal elders and community leaders tend to not release the location of these properties.

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

According to the General Plan EIR (San Bernardino County, 2006 at page IV-58), only about 25 percent of the County has been surveyed for cultural resources; however, many of these surveys were conducted prior to current professional standards established for cultural resources surveys and thus need to be re-surveyed. The figures for known sites and previous surveys are constantly changing as new data and results from technical studies arrive, and as California Register of Historical Resources and National Register of Historic Places paperwork is processed. The preponderance of both prehistoric and historic sites throughout the County, and the vast areas that have yet to be systematically surveyed for cultural resources, indicate that an equal amount of cultural resources, as yet unidentified, are present.

PALEONTOLOGICAL RESOURCES

Paleontological resources, the fossil remains of these ancient life forms, are the evidence of ancient life forms. Fossilization is a process in which remains (usually bone) are mineralized. Paleontological resource consists of fossils and trace fossils (outlines or imprints of ancient life forms) preserved in sedimentary rock units, particularly fine-to-medium-grained marine, lake, and stream deposits such as limestone, siltstone, sandstone, or shale, and in ancient soils (paleosols). Paleontological resources are also found in coarse-grained sediments such as conglomerates or coarse alluvium. Though it is rare for fossils to occur in igneous or metamorphic rock units, these occurrences are known to occur in San Bernardino County (San Bernardino County, 2006 at page IV-59).

Fossils may occur throughout a sedimentary unit, and in fact are more likely to be preserved in the subsurface, where they have not been damaged or destroyed by previous ground disturbance, amateur collecting, or natural causes such as erosion. In contrast, cultural resources are often recognized by surface evidence of their presence. A field survey for paleontological resources can indicate that sediments likely to contain fossils are present, even if fossils are not observed on the surface. Excavation is often the only way in which fossils are discovered (San Bernardino County, 2006 at page IV-59).

San Bernardino County has more than 3,000 paleontological localities recorded in the Regional Paleontologic Locality Inventory at the San Bernardino County Museum (San Bernardino County, 2006 at page IV-59).

3.5.2 REGULATORY FRAMEWORK

FEDERAL

National Environmental Policy Act

The National Register of Historic Places (NRHP) is the nation's master inventory of known historic resources. The NRHP is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level.

Structures, sites, buildings, districts, and objects over 50 years of age can be listed in the NRHP as significant historic resources. However, properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP. The criteria for listing in the NRHP include resources that:

- a) Are associated with events that have made a significant contribution to the broad patterns of history;

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

- b) Are associated with the lives of persons significant in our past;
- c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) Have yielded or may likely yield information important in prehistory or history.

STATE

California Register of Historical Resources

The State Historical Resources Commission has designed the California Register of Historic Resources (CRHR) for use by state and local agencies, private groups, and citizens to identify, evaluate, register, and protect California's historical resources. The CRHR is the authoritative guide to the state's significant historical and archeological resources. This program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding, and affords certain protections under CEQA.

California Environmental Quality Act

Under CEQA, public agencies must consider the effects of their actions on both "historical resources" and "unique archaeological resources." Pursuant to Public Resources Code (PRC) Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether proposed projects would have effects on unique archaeological resources.

Historical resource is a term with a defined statutory meaning (PRC Section 21084.1; determining significant impacts to historical and archaeological resources is described in the CEQA Guidelines, Section 15064.5 [a], [b]). Under CEQA Guidelines Section 15064.5(a), historical resources include the following:

- 1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Public Resources Code, Section 5024.1).
- 2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- 3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

record. Generally, a resource will be considered by the lead agency to be “historically significant” if the resource meets the criteria for listing in the California Register of Historical Resources (Public Resources Code, Section 5024.1), including the following:

- a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
 - b) Is associated with the lives of persons important in our past;
 - c) 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
 - d) Has yielded, or may be likely to yield, information important in prehistory or history.
- 4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code[PRC]), or identified in a historical resources survey (meeting the criteria in Section 5024.1(g) of the PRC) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Section 5020.1(j) or 5024.1.

Historic resources are usually 45 years old or older and must meet at least one of the criteria for listing in the California Register, described above (such as association with historical events, important people, or architectural significance), in addition to maintaining a sufficient level of physical integrity.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be historical resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC, Section 5024.1 and California Code of Regulations (CCR), Title 14, Section 4850). Unless a resource listed in a survey has been demolished, lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not eligible for listing, a lead agency should consider the resource to be potentially eligible for the CRHR.

For historic structures, CEQA Guidelines Section 15064.5, subdivision (b)(3) indicates that a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings, or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995) shall be considered as mitigating impacts to a less than significant level.

As noted above, CEQA also requires lead agencies to consider whether projects will impact “unique archaeological resources.” Public Resources Code Section 21083.2, subdivision (g), states that “ ‘unique archaeological resource’ means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

Treatment options under Section 21083.2 include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a unique archaeological resource).

Section 7050.5(b) of the California Health and Safety Code (CHSC) specifies protocol when human remains are discovered, as follows:

In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code.

CEQA Guidelines Section 15064.5, subdivision (e) 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, if any, as timely identified by the Native American Heritage Commission. Section 15064.5 directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

In addition to the mitigation provisions pertaining to accidental discovery of human remains, the CEQA Guidelines also require that a lead agency make provisions for the accidental discovery of historical or archaeological resources, generally. Pursuant to Section 15064.5, subdivision (f), these provisions should include "an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."

Paleontological resources are classified as non-renewable scientific resources. California Public Resources Code Section 5097.5 et seq makes it a misdemeanor for anyone to knowingly disturb any archaeological, paleontological, or historical features situated on public lands. No state or local agencies have specific jurisdiction over paleontological resources. No state or local agency requires a paleontological collecting permit to allow for the recovery of fossil remains

discovered as a result of construction-related earth-moving on state or private land in a project site.

LOCAL

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to protect cultural and paleontological resources. The General Plan has identified Cultural Resource Overlay areas and requires new development proposed within these areas to perform a cultural resources field survey and evaluation. Furthermore, the General Plan requires that mitigation of impacts to important cultural resources follow the standards established in Appendix G of the California Environmental Quality Act Guidelines. For a complete list of the applicable policies, please refer to the Methodology subsection below which provides all of the General Plan policies and programs which address cultural resources in the County. These policies are designed to guide future development in a way that lessens impacts to these features. These provisions are discussed in more detail within the impact discussions below.

San Bernardino Development Code

Division 2, Land Use Zoning Districts and Allowed Land Uses

Chapter 82.12 (Cultural Resource Preservation Overlay) of the Development Code is intended to provide for the identification and preservation of important archaeological and historical resources in the County. The application for a new development project proposed within a Cultural Resource Preservation Overlay is required to include a report prepared by a qualified professional that determines through appropriate investigation the presence or absence of archaeological and/or historical resources on the project site and within the project area, and recommends appropriate data recovery or protection measures. The measures may include site recordation, mapping and surface collection of artifacts with appropriate analysis and curation, preservation in an open space easement and/or dedication to an appropriate institution with provision for any necessary maintenance and protection, and/or proper curation of archeological and historical resource data and artifacts collected within a project area pursuant to federal repository standards.

Chapter 82.20 (Paleontological Resource Overlay) of the Development Code is intended to provide for the identification and preservation of important paleontological resources in the County and when a land use is proposed within a Paleontological Resource Overlay, the project is evaluated for compliance with the intent of the overlay.

3.5.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of impacts to cultural and paleontological resources of the General Plan (San Bernardino County, 2006 at page IV-59).

- 1) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

- 2) Cause a substantial adverse change in the significance of an archaeological resource as defined in CEQA Guidelines Section 15064.5.
- 3) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- 4) Disturb any human remains, including those interred outside of formal cemeteries.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects From Implementation of the San Bernardino County General Plan Update (March 13, 2007). As described further below, the determination of significance of the impacts are based on whether the proposed Project would result in new significant impacts or a substantial increase in severity of previously identified impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's one previously disclosed cultural and paleontological resource related impact:

Impact CR 1 – Future development pursuant to the General Plan Update may disturb known and unknown archeological sites, historic buildings or structures or paleontological resources. (San Bernardino County, 2007b, at page 10).

As identified in the Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings), this impact was identified as less than significant with the adoption of identified mitigation measures (San Bernardino County, 2007b, at page 10).

The following adopted General Plan policies and programs address cultural and paleontological resources and are designed to guide future development in a way that lessens impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in General Plan EIR directly into the General Plan, as policies.

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.
CO 3.1 Program 1	Require a cultural resources field survey and evaluation prepared by a qualified professional for projects located within the mapped Cultural Resource Overlay area.
CO 3.1 Program 2	Mitigation of impacts to important cultural resources will follow the standards established in Appendix G of the California Environmental Quality Act Guidelines, as amended to date.
Policy CO 3.2	Identify and protect important archaeological and historic cultural resources in all lands that involves disturbance of previously undisturbed ground.

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

CO 3.2 Program 1	Require the Archaeological Information Center at the San Bernardino County Museum to conduct a preliminary cultural resource review prior to the County's application acceptance for all land use applications in planning regions lacking Cultural Resource Overlays and in lands located outside of planning regions.
CO 3.2 Program 2	Should the County's preliminary review indicate the presence of known cultural resources or moderate to high sensitivity for the potential presence of cultural resources, a field survey and evaluation prepared by a qualified professional will be required with project submittal. The format of the report and standards for evaluation will follow the "Guidelines for Cultural Resource Management Reports" on file with the San Bernardino County Land Use Services Department.
Policy CO 3.3	Establish programs to preserve the information and heritage value of cultural and historical resources.
CO 3.4 Program 1	Site record forms and reports of surveys, test excavations, and data recovery programs will be filed with the Archaeological Information Center at the San Bernardino County Museum, and will be reviewed and approved in consultation with that office. a. Preliminary reports verifying that all necessary archaeological or historical fieldwork has been completed will be required prior to project grading and/or building permits. b. Final reports will be submitted and approved prior to project occupancy permits.
CO 3.4 Program 3	When avoidance or preservation of an archaeological site or historic structure is proposed as a form of mitigation, a program detailing how such long-term avoidance or preservation is assured will be developed and approved prior to conditional approval.
CO 3.4 Program 4	In areas of potential but unknown sensitivity, field surveys prior to grading will be required to establish the need for paleontologic monitoring.
CO 3.4 Program 5	Projects requiring grading plans that are located in areas of known fossil occurrences, or demonstrated in a field survey to have fossils present, will have all rough grading (cuts greater than 3 feet) monitored by trained paleontologic crews working under the direction of a qualified professional, so that fossils exposed during grading can be recovered and preserved. Fossils include large and small vertebrate fossils, the latter recovered by screen washing of bulk samples.
CO 3.4 Program 6	A report of findings with an itemized accession inventory will be prepared as evidence that monitoring has been successfully prior to granting of building permits, and a final report will be submitted

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

and approved prior to granting of occupancy permits. The adequacy of paleontologic reports will be determined in consultation with the Curator of Earth Science, San Bernardino County Museum.

- Policy CO 3.5 Ensure that important cultural resources are avoided or minimized to protect Native American beliefs and traditions.
- CO 3.5 Program 1 Consistent with SB 18, as well as possible mitigation measures identified through the CEQA process, the County will work and consult with local tribes to identify, protect and preserve "traditional cultural properties" (TCPs). TCPs include both manmade sites and resources as well as natural landscapes that contribute to the cultural significance of areas.
- CO 3.5 Program 2 The County will protect confidential information concerning Native American cultural resources with internal procedures, per the requirements of SB 922, an addendum to SB 18. The purpose of SB 922 is to exempt cultural site information from public review as provided for in the Public Records Act. Information provided by tribes to the County shall be considered confidential or sacred.
- CO 3.5 Program 3 The County will work in good faith with the local tribes, developers/applicants and other parties if the local affected tribes request the return of certain Native American artifacts from private development projects. The developer is expected to act in good faith when considering the local tribe's request for artifacts. Artifacts not desired by the local tribe will be placed in a qualified repository as established by the California State Historical Resources Commission. If no facility is available, then all artifacts will be donated to the local tribe.
- CO 3.5 Program 5 Because contemporary Native Americans have expressed concern over the handling of the remains of their ancestors, particularly with respect to archaeological sites containing human burials or cremations, artifacts of ceremonial or spiritual significance, and rock art, the following actions will be taken when decisions are made regarding the disposition of archaeological sites that are the result of prehistoric or historic Native American cultural activity:
- a. The Native American Heritage Commission and local reservation, museum, and other concerned Native American leaders will be notified in writing of any proposed evaluation or mitigation activities that involve excavation of Native American archaeological sites, and their comments and concerns solicited.
 - b. The concerns of the Native American community will be fully considered in the planning process.

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

- c. If human remains are encountered during grading and other construction excavation, work in the immediate vicinity will cease and the County Coroner will be contacted pursuant to the state Health and Safety Code.
- d. In the event that Native American cultural resources are discovered during project development and/or construction, all work in the immediate vicinity of the find will cease and a qualified archaeologist meeting U.S. Secretary of Interior standards will be hired to assess the find. Work on the overall project may continue during this assessment period.
- e. If Native American cultural resources are discovered, the County will contact the local tribe. If requested by the tribe, the County will, in good faith, consult on the discovery and its disposition with the tribe.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact to cultural or paleontological resources not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impact CR-1.

The exact subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible impacts to cultural and paleontological resources from implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (Functionally Equivalent Documents – see Section 3.0 for a description of these documents).

IMPACTS AND MITIGATION MEASURES

Historical Resources

Impact 3.5.1 General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to historical resources due to the adoption of mitigation measures (General Plan EIR Impact CR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of historic resource impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

While this analysis recognizes the programmatic nature of the proposed Project, few if any of the proposed GHG reduction measures are anticipated to result in the destruction or damage to

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

historic resources in the County. GHG reduction measures such as the implementation of vehicle miles traveled reduction strategies (R2T2), the promotion of bicycle and pedestrian infrastructure (R2T7), the construction of vehicle lanes for high occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4) represent further intensification of existing transportation facilities, rather than the complete disruption of a previously undisturbed setting or existing historic neighborhood. However, implementation of other reduction measures in the GHG Plan, such as the installation of solar photovoltaic panels [e.g., Residential Renewable Energy Incentives (R2E3), Warehouse Renewable Incentive Program (R2E4), and the installation of solar photovoltaic systems on five County buildings (R2E8-INT)] has the potential to impact historical buildings if the installation of solar facilities were proposed for a building that is or may be considered historic.

Continued implementation of General Plan policies and programs as well as the County Development Code would ensure protection and preservation of significant historical resources by identifying resources and avoiding or mitigating potential impacts. For example, Policy CO 3.1 states that the County shall identify and protect important historic, cultural resources in areas of the County that have been determined to have known cultural resource sensitivity. CO 3.1 Program 1 requires a cultural resources field survey and evaluation prepared by a qualified professional for projects located within the mapped Cultural Resource Overlay area. In addition, Chapter 82.12 (Cultural Resource Preservation Overlay) of the Development requires that a new development project proposed within a Cultural Resource Preservation Overlay in which the presence of historical resources has been determined on the project site obtain recommendations of appropriate data recovery or protection measures by a qualified professional. The measures may include site recordation, mapping and surface collection of artifacts with appropriate analysis and curation, preservation in an open space easement and/or dedication to an appropriate institution with provision for any necessary maintenance and protection, and/or proper curation of archeological and historical resource data and artifacts collected within a project area pursuant to federal repository standards.

CO 3.1 Program 2 of the General Plan states that mitigation of impacts to important cultural resources will follow the standards established in Appendix G of the California Environmental Quality Act Guidelines, and similarly, CO 3.4 Program 3 requires that when avoidance or preservation of a historic structure is proposed as a form of mitigation, a program detailing how such long-term avoidance or preservation is assured will be developed and approved prior to conditional approval. Therefore any subsequent GHG reduction measure implemented as part of the proposed Project would be required to concur with these County mandates on a case-by-case basis. For example, the construction of a bike lane as part of GHG reduction measure R2T7, in any region of the unincorporated County known to have historic resources, would be required to complete a cultural resources field survey and evaluation prepared by a qualified professional. Similarly, the installation of solar photovoltaic systems on five County buildings as part of GHG Reduction Measure R2E8-INT would require a determination if any of the five County buildings are designated as historic resources and if so, a program would be required detailing how historic resource impact avoidance or preservation is assured.

Future discretionary approvals that could result in the demolition and/or renovation of historical resources will be subject to individual review of potential impacts under a separate CEQA document. Historic resources are also protected under the regulations of the National Historic Preservation Act and the Department of Transportation Act of 1966. GHG reduction measure projects would be subject to local ordinance requirements, including General Plan provisions that protect cultural resources.

Regulatory provisions such as Policy CO 3.1 and CO 3.1 Program 1, CO 3.1 Program 2, and CO 3.4 Program 3 are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document prepared for the Renewable Electricity Standard (CARB, 2010), which addresses impacts resulting from future Renewable Electricity Standard projects (i.e., alternative energy generation projects). The Functional Equivalent Document prepared for the Renewable Electricity Standard identified compliance with environmental review requirements, retention of qualified cultural resource specialists for cultural resources field survey as needed, and the designation of areas of resource sensitivity. **Thus, there is no new or substantially more severe significant impact.**

Known and Undiscovered Archaeological Resources and Human Remains

Impact 3.5.2 General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to archaeological resources due to the adoption of mitigation measures (General Plan EIR Impact CR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of archaeological resource impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Development of some of the proposed Project's GHG reduction measures could result in damage, destruction, or removal of known and/or unrecorded archaeological resources, resulting in impacts. Many of the GHG reduction measures such as public transit expansion measures (R3T1), the expansion of the vanpool program (R2EC1-INT), the installation of solar photovoltaic systems of five County buildings (R2E8-INT), and increased use of combined heat and power systems (R1E6) are not expected to generate significant impacts because they are minor improvements to existing infrastructure and/or County programs. However, there are several other GHG reduction measures that would involve grading and paving or the construction of permanent facilities which could potentially disturb and/or damage undiscovered archaeological resources and human remains.

Archaeological resources have been identified by previous investigations in the County, and it is anticipated that additional archaeological resources may be discovered in other areas throughout the County during construction allowed under the proposed Project. The development of GHG reduction measures which could occur has the potential to destroy and/or degrade known and unknown prehistoric archaeological resources, historical archaeological resources, or human remains. As noted above, CEQA Guidelines Section 15064.5, subdivision (e) requires that excavation activities be stopped whenever human remains are uncovered and the County coroner is 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, if any, as timely identified by the Native American Heritage Commission. Section 15064.5 directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains (also see CO 3.5 Program 5 listed above).

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

Continued implementation of the General Plan policies and programs would ensure protection and preservation of significant archaeological resources by identifying resources and avoiding or mitigating potential impacts. For example, 2007 General Plan Policy CO 3.1 states that the County shall identify and protect important cultural resources in areas of the County that have been determined to have known cultural resource sensitivity. The County requires all land use applications in planning regions lacking Cultural Resource Overlays and in lands located outside of planning regions to retain the Archaeological Information Center at the San Bernardino County Museum to conduct a preliminary cultural resource review prior to the County's application acceptance (CO 3.4 Program 1). CO 3.4 Program 1 states that site record forms and reports of surveys, test excavations, and data recovery programs will be filed with the Archaeological Information Center of the California Historical Resources Information System at the San Bernardino County Museum, and will be reviewed and approved in consultation with that office¹. Therefore, enforcement of these two General Plan provisions serve as mechanisms to lessen archaeological impacts to both lands known to have cultural resource sensitivity as well as unclassified lands.

In addition, General Plan program CO 3.4 Program 3 requires that when avoidance or preservation of archaeological resources is proposed as a form of mitigation, a program detailing how such long-term avoidance or preservation is assured will be developed and approved prior to conditional approval. The avoidance and preservation measures may include site recordation, mapping and surface collection of artifacts with appropriate analysis and curation, preservation in an open space easement and/or dedication to an appropriate institution with provision for any necessary maintenance and protection, and/or proper curation of archeological and historical resource data and artifacts collected within a project area pursuant to federal repository standards. Thus, this impact would be less than significant as continued implementation of General Plan policy provisions would ensure that the proposed Project would not result in a new impact that was not addressed in General Plan EIR or increase the severity of a significant impact that was addressed in General Plan EIR.

Regulatory provisions such as Policy CO 3.1 and programs CO 3.4 Program 1, CO 3.4 Program 3, and CO 3.5 Program 5 are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document prepared for the Renewable Electricity Standard (CARB, 2010), which addresses impacts resulting from future Renewable Electricity Standard projects (i.e., alternative energy generation projects). The Functional Equivalent Document prepared for the Renewable Electricity Standard identified compliance with environmental review requirements, the designation of areas of resource sensitivity, and coordination of Native Americans when appropriate. **Thus, there is no new or substantially more severe significant impact.**

Paleontological Resources

Impact 3.5.3 General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to paleontological resources due to the adoption of mitigation measures (General Plan EIR Impact CR-1). Implementation of General Plan policy provisions and the continued implementation of the County

¹ The California Historical Resources Information System is a nonprofit organization located at various universities and museums throughout the state of California. California Historical Resources Information System staff provides research and information services regarding California history and prehistory (Cal-Fire, 1999).

3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of paleontological resource impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

San Bernardino County has more than 3,000 paleontological localities recorded in the Regional Paleontologic Locality Inventory at the San Bernardino County Museum (San Bernardino County, 2006 at page IV-59). The potential exists for GHG Plan reduction measures to disturb other undiscovered paleontological resources. However, the General Plan CO 3.4 Program 4 states that in areas of potential but unknown sensitivity, field surveys prior to grading will be required in order to establish the need for paleontologic monitoring. Similarly, CO 3.4 Program 5 mandates that projects requiring grading plans and located in areas of known fossil occurrences, or demonstrated in a field survey to have fossils present, will have all rough grading (cuts greater than 3 feet) monitored by trained paleontologic crews working under the direction of a qualified professional, so that fossils exposed during grading can be recovered and preserved. In addition, Chapter 82.20 (Paleontological Resource Overlay) requires that when a land use is proposed within a Paleontological Resource Overlay, it is evaluated for compliance with the intent of the overlay, which is to preserve paleontological resources. **Thus, there is no new or substantially more severe significant impact.**

3.6 HAZARDS AND HAZARDOUS MATERIALS

3.6 HAZARDS AND HAZARDOUS MATERIALS

This section provides information on safety hazards in San Bernardino County, analyzes the potential of the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and Development Code Amendment (referred to collectively hereafter as the proposed Project) to create hazards to the public health or the environment related to hazardous materials, substances, or waste, and identifies other potential hazards that may impact public safety. The existing setting and analysis in this section utilizes the County of San Bernardino 2007 General Plan and its associated Environmental Impact Report, as well as recently prepared environmental review documents for renewable energy projects in the county and the County of San Bernardino Development Code.

3.6.1 EXISTING SETTING

HAZARDOUS MATERIALS AND WASTE DEFINED

According to 22 California Code of Regulations (CCR) Section 66261.20, the term *hazardous substance* refers to both hazardous materials and hazardous wastes and both are classified according to four properties: toxicity, ignitability, corrosiveness, and reactivity. A hazardous material is defined by 22 CCR Section 66261.10 as a substance or combination of substances that may cause or significantly contribute to an increase in serious, irreversible, or incapacitating illness or may pose a substantial presence or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Public health is potentially at risk whenever hazardous materials are or will be used. It is necessary to differentiate between the hazard of these materials and the acceptability of the risk they pose to human health and the environment. A hazard is any situation that has the potential to cause damage to human health and the environment. The risk to health and public safety is determined by the probability of exposure, and to the inherent toxicity of a material (DTSC 2010a).

Factors that can influence health effects when human beings are exposed to hazardous materials include the dose the person is exposed to, the frequency of exposure, the duration of exposure, the exposure pathway (route by which a chemical enters a person's body), and the individual's unique biological susceptibility.

Hazardous wastes are hazardous substances that no longer have practical use, such as materials that have been discarded, discharged, spilled, or contaminated or are being stored until they can be disposed of properly (22 CCR Section 66261.10). Soil that is excavated from a site containing hazardous materials is a hazardous waste if it exceeds specific 22 CCR criteria. While hazardous substances are regulated by multiple agencies, as described in the Regulatory Framework subsection below, cleanup requirements of hazardous wastes are determined on a case-by-case basis according to the agency with lead jurisdiction over the project.

HAZARDOUS AND CONTAMINATED SITES

Hazardous materials consist of substances that by their nature, lack of containment, and reactivity have the capability for inflicting harm. Hazardous materials can be toxic, corrosive, flammable, explosive, reactive, an irritant, or a strong sensitizer and include certain infectious agents, radiological materials, oxides, oil, used oil, petroleum products, and industrial solid waste substances. They are used in almost every manufacturing operation and by retailers, service industries, and homeowners. Hazardous material incidents are one of the most common

3.6 HAZARDS AND HAZARDOUS MATERIALS

technological threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, or accident.

Areas of Known Hazardous Contamination

Cortese List

The State of California Hazardous Waste and Substances Site List (also known as the Cortese List) is a planning document used by state and local agencies and by private developers to comply with California Environmental Quality Act (CEQA) requirements in providing information about the location of hazardous materials sites. California Government Code Section 65962.5 requires the California Environmental Protection Agency to annually update the Cortese List. The Department of Toxic Substances Control (DTSC) is responsible for preparing a portion of the information that comprises the Cortese List. Other state and local government agencies are required to provide additional hazardous material release information that is part of the complete list.

DTSC's EnviroStor database provides DTSC's component of Cortese List data by identifying state response sites, federal Superfund sites, school cleanup sites, and voluntary cleanup sites. The EnviroStor database identifies sites that have known contamination or sites for which further investigation is warranted. It also identifies facilities that are authorized to treat, store, dispose, or transfer hazardous waste (DTSC 2010b).

The EnviroStor database identifies 87 hazardous material sites in San Bernardino County known to handle and store hazardous materials or associated with a hazardous material-related release or occurrence. The terms *release* and *occurrence* include any means by which a substance could harm the environment by spilling, leaking, discharging, dumping, injecting, or escaping. These sites are listed in **Table 3.6-1**.

TABLE 3.6-1
KNOWN HAZARDOUS WASTE SITES IN THE COUNTY PLANNING AREA
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Facilities	Number
Facilities that Produce and Release Air Pollutants	16
Facilities that Reported Toxic Release	7
Facilities that Have Reported Hazardous Waste Activities	87
Potential Hazardous Waste Sites that are Part of the Superfund Program	6
Sites currently on the National Priorities List	1
Sites Not on the National Priorities List	5

Source: DTSC 2010b

Of the potential hazardous waste sites that have been listed under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund, four hazardous waste sites have been assigned the highest cleanup priority, the National Priorities List, as listed below (Scorecard 2010).

- Marine Corps Logistics Base in Barstow
- George Air Force Base in Victorville

- Newmark Groundwater Contamination in San Bernardino
- Norton Air Force Base in San Bernardino

TRANSPORTATION OF HAZARDOUS MATERIALS

Hazardous materials transported through San Bernardino County are carried by truck on the state highway system or via the rail line. Common carriers are licensed by the California Highway Patrol (CHP), pursuant to the California Vehicle Code, Section 32000. This section requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards. Common carriers conduct a large portion of their business in the delivery of hazardous materials.

The CHP and the California Department of Transportation (Caltrans) have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. The CHP conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identifications teams at locations throughout the state.

3.6.2 REGULATORY FRAMEWORK

FEDERAL – HAZARDOUS MATERIALS

Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) provides leadership in the nation's environmental science, research, education, and assessment efforts with the mission of protecting human health and the environment. USEPA works to develop and enforce regulations that implement environmental laws enacted by Congress. USEPA is responsible for researching and setting national standards for a variety of environmental programs and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. The agency also performs environmental research, sponsors voluntary partnerships and programs, provides direct support through grants to state environmental programs, and advances educational efforts regarding environmental issues. USEPA develops and enforces regulations that span many environmental categories, including hazardous materials. Specific regulations include those regarding asbestos, brownfields, toxic substances, underground storage tanks, and Superfund sites, as discussed below.

Federal Clean Air Act

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes USEPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. Section 112 of the Clean Air Act addresses emissions of hazardous air pollutants. Prior to 1990, the CAA established a risk-based program under which only a few standards were developed. The 1990 Clean Air Act Amendments revised

3.6 HAZARDS AND HAZARDOUS MATERIALS

Section 112 to first require issuance of technology-based standards for major sources and certain area sources. Major sources are defined as a stationary source or group of stationary sources that emit or have the potential to emit 10 tons per year or more of a hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. For major sources, Section 112 requires that USEPA establish emission standards that require the maximum degree of reduction in emissions of hazardous air pollutants. These emission standards are commonly referred to as maximum achievable control technology, or MACT standards. Eight years after the technology-based MACT standards are issued for a source category, USEPA is required to review those standards to determine whether any residual risk exists for that source category and, if necessary, revise the standards to address such risk (USEPA 2009b).

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) gives USEPA the authority to control hazardous waste from “cradle-to-grave,” including the generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA also sets forth a framework for the management of nonhazardous solid wastes. The 1986 amendments to the RCRA enabled the Environmental Protection Agency to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

The Federal Hazardous and Solid Waste Amendments (HSWA) are the 1984 amendments to the RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for USEPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program (USEPA 2009b).

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), provides a federal “superfund” to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through CERCLA, the United States Environmental Protection Agency was given power to seek out those parties responsible for any release and assure their participation in the cleanup. USEPA is authorized to implement CERCLA in all 50 states and in U.S. territories. Superfund site identification, monitoring, and response activities in states are coordinated through the state environmental protection or waste management agencies. The Superfund Amendments and Reauthorization Act (SARA) of 1986 reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definition clarifications, and technical requirements were added to the legislation, including additional enforcement authorities (USEPA 2009b).

Small Business Liability Relief and Brownfields Revitalization Act

On January 11, 2002, the Small Business Liability Relief and Brownfields Revitalization Act was signed into law. The Brownfields Law amended CERCLA by providing funds to assess and clean up brownfields, clarified CERCLA liability protections, and provided funds to enhance state and tribal response programs.

Occupational and Safety Health Act

Congress passed the Occupational and Safety Health Act (OSHA) in 1970 to ensure worker and workplace safety. The goal was to ensure that employers provide their workers a place of

employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. OSHA is a division of the U.S. Department of Labor that oversees the administration of the act and enforces standards in all 50 states.

Toxic Substances Control Act of 1976

The Toxic Substances Control Act of 1976 (TSCA) provides USEPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from the TSCA, including, among others, food, drugs, cosmetics, and pesticides. The TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint.

Various sections of the TSCA provide authority to:

- Require, under Section 5, pre-manufacture notification for “new chemical substances” before manufacture.
- Require, under Section 4, testing of chemicals by manufacturers, importers, and processors where risks or exposures of concern are found.
- Issue Significant New Use Rules (SNURs), under Section 5, when it identifies a “significant new use” that could result in exposures to, or releases of, a substance of concern.
- Maintain the TSCA Inventory, under Section 8, which contains more than 83,000 chemicals. As new chemicals are commercially manufactured or imported, they are placed on the list.
- Require those importing or exporting chemicals, under Sections 12(b) and 13, to comply with certification reporting and/or other requirements.
- Require, under Section 8, reporting and recordkeeping by persons who manufacture, import, process, and/or distribute chemical substances in commerce.
- Require, under Section 8(e), that any person who manufactures (including imports), processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment to immediately inform USEPA, except where USEPA has been adequately informed of such information.

In 2008, USEPA expanded efforts to protect citizens from existing chemicals by making basic screening-level toxicity information on them publicly available with the Chemical Assessment and Management Program, or ChAMP (USEPA 2009b).

U.S. Department of Transportation

Federal Hazardous Materials Transportation Law and Hazardous Materials Regulations

The federal hazardous materials transportation law (federal hazmat law), 49 U.S.C. Section 5101 et seq., is the basic statute regulating hazardous materials transportation in the United States. Section 5101 of the federal hazmat law states that the purpose of the law is to protect against

3.6 HAZARDS AND HAZARDOUS MATERIALS

the risks to life, property, and the environment that are inherent in the transportation of hazardous material in intrastate, interstate, and foreign commerce.

The Hazardous Materials Regulations (HMR), which implement the federal hazmat law, govern the transportation of hazardous materials by highway, rail, vessel, and air. The HMR address hazardous materials classification, packaging, hazard communication, emergency response information, and training. The Pipeline and Hazardous Material Safety Administration (PHMSA) also issues procedural regulations, including provisions on registration and public sector training and planning grants (49 CFR Parts 105, 106, 107, and 110). The Pipeline and Hazardous Material Safety Administration issues the HMR (PHMSA 2009).

The Federal Motor Carrier Safety Administration

The Federal Motor Carrier Safety Administration issues regulations concerning highway routing of hazardous materials, the hazardous materials endorsement for a commercial driver's license, highway hazardous material safety permits, and financial responsibility requirements for motor carriers of hazardous materials (PHMSA 2009).

The National Defense Authorization Act for Fiscal Year 2010

The National Defense Authorization Act 2010 requires the Department of Defense to study and report on the effects of wind projects on military readiness. The Department of Defense (DOD) implemented the DOD/DHS Long Range Radar Joint Program Office Interim Policy, which contests the development of any wind energy project within radar line of site of the National Air Defense and Homeland Security Radars in order to address concerns about the potential interference with military radar operations. DOD would evaluate wind projects on a case-by-case basis in coordination with the Federal Aviation Administration (FAA).

STATE

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) was created in 1991 by Governor's Executive Order. The six boards, departments, and office were placed under the CalEPA "umbrella" to create a cabinet-level voice for the protection of human health and the environment and to assure the coordinated deployment of state resources. The mission of CalEPA is to restore, protect, and enhance the environment to ensure public health, environmental quality, and economic vitality (CalEPA 2010).

Unified Program

The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the following six environmental and emergency response programs (CalEPA 2010):

- The Hazardous Waste Generator (HWG) program and Hazardous Waste On-site Treatment activities
- The Aboveground Storage Tank (AST) program Spill Prevention Control and Countermeasure Plan requirements
- The Underground Storage Tank (UST) program

- The Hazardous Materials Release Response Plans and Inventory (HMRRP) program
- California Accidental Release Prevention (CalARP) program
- The Hazardous Materials Management Plans and the Hazardous Materials Inventory Statement (HMMP/HMIS) requirements

The Secretary of CalEPA is directly responsible for coordinating the administration of the Unified Program. The Unified Program requires all counties to apply to the CalEPA Secretary for the certification of a local unified program agency. Qualified cities are also permitted to apply for certification. The local Certified Unified Program Agency (CUPA) is required to consolidate, coordinate, and make consistent the administrative requirements, permits, fee structures, and inspection and enforcement activities for these six program elements in the county. Most CUPAs have been established as a function of a local environmental health or fire department.

Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California, primarily under the authority of the federal Resource Conservation and Recovery Act of 1976 and the California Health and Safety Code. The U.S. Environmental Protection Agency authorizes DTSC to carry out the Resource Conservation and Recovery Act (RCRA) program in California. Permitting, inspection, compliance, and corrective action programs ensure that people who manage hazardous waste follow state and federal requirements. Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning. The following are descriptions of the roles and responsibilities of DTSC's organizational programs (DTSC 2010a).

Site Mitigation and Brownfields Reuse Program

- **Statewide Cleanup Operations Division** – DTSC's Statewide Cleanup Operations Division conducts and oversees cleanup of sites contaminated with a toxic substance, coordinating all aspects of the cleanup from investigation through certification. Expediting this cleanup work is one of the most important goals of the program. DTSC created the Voluntary Cleanup Program, Expedited Remedial Action Pilot program, and other brownfields tools to encourage redevelopment of blighted urban areas. DTSC also encourages property owners to investigate and clean up contamination through a combination of low-interest loans. In 2001, the Investigating Site Contamination and Cleanup Loans and Environmental Assistance to Neighborhoods (ISCP and CLEAN) programs received 11 loan applications totaling \$7.9 million to investigate and clean up urban properties.
- **School Property Evaluation and Cleanup Division** – The School Property Evaluation and Cleanup Division works to ensure that all new, existing, and proposed school sites are environmentally safe. State law requires all proposed school sites that will receive state funding for purchase or construction to go through DTSC's rigorous environmental review. If the properties were previously contaminated, DTSC Schools Division staff makes sure they have been cleaned up to a level that is safe for students and faculty.

3.6 HAZARDS AND HAZARDOUS MATERIALS

- **Office of Military Facilities** – The Office of Military Facilities is responsible for investigation, technical assistance, and oversight of cleanup operations at contaminated California properties currently or previously operated by the Department of Defense.
- **Emergency Response and Statewide Operations Division** – DTSC's Emergency Response and Statewide Operations Division (ERSO) encompasses several elements. The Emergency Response Program provides immediate assistance in the case of sudden releases or threatened releases of hazardous materials. This program includes disaster response, illegal drug lab cleanup and developing remediation guidelines for illegal drug labs, and off-highway removal. ERSO also houses the Engineering and Geological Services Branch, which supports the other programs within DTSC by providing expert technical assistance. ERSO has lead responsibility for conducting cleanup and enforcement actions at several high-profile federal Superfund sites.
- **Planning and Management Branch** – The Planning and Management Branch is a headquarters organization responsible for developing and managing various federal grants that help fund the Site Mitigation and Brownfields Reuse Program. Staff analyze state and federal legislation, develop policy and procedure, coordinate the annual workplan, and perform consolidated budget and personnel functions. In addition, Site Mitigation and Brownfields Reuse maintains a database of confirmed and suspected hazardous waste substance release sites.

Hazardous Waste Management Program

The Hazardous Waste Management Program (HWMP) regulates hazardous waste through its permitting, enforcement, and Unified Program activities. The main focus of HWMP is to ensure the safe storage, treatment, transportation, and disposal of hazardous wastes.

- **Permitting & Corrective Action Division** – The Permitting Division authorizes facilities to treat, store, and dispose of hazardous waste in a manner consistent with federal, state, and local laws. Types of authorization include permits, emergency permits, and variances. The purpose of this process is to ensure that these facilities and their operators meet requirements for safe operating conditions, financial assurance, and environmental monitoring. In addition, the division conducts the corrective action and closure programs, including long-term maintenance of closed facilities for closed hazardous waste facilities.
- **Statewide Compliance Division** – The Statewide Compliance Division (SCD) monitors hazardous waste transfer, storage, treatment, and disposal facilities for illegal activity. SCD carries out a technical investigation program that provides sampling, technical site investigation, and expert testimony for civil and criminal investigations brought by the California Attorney General, district attorneys, regional environmental crimes task forces, and federal attorneys. Staff members conduct routine inspections, investigate complaints, monitor hazardous waste transporters and their manifests, and take enforcement action against those who violate hazardous waste laws. In addition, SCD makes sure that commercial hazardous waste management facilities have adequate financial resources to cover both sudden accidental liability and the long-term costs of closing the facility.
- **State Regulatory Programs Division** – The State Regulatory Programs Division (SRPD) oversees the implementation of the hazardous waste generator and on-site treatment program, one of the six environmental programs at the local level consolidated within

the Unified Program. SRPD participates in the triennial review of 72 Certified Unified Program Agencies (CUPAs) to ensure that their programs are consistent statewide, conform to standards, and deliver quality environmental protection at the local level. SRPD also carries out the state's hazardous waste recycling and resource recovery program, a waste evaluation program to assist in waste determinations, and the household hazardous waste and agricultural chemical collection programs. The division conducts a corrective action oversight program that assures any releases of hazardous constituents at generator facilities that conduct on-site treatment of hazardous waste are safely and effectively remediated.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) was created by the California legislature in 1967. The mission of SWRCB is to ensure the highest reasonable quality for waters of the state, while allocating those waters to achieve the optimum balance of beneficial uses. The joint authority of water allocation and water quality protection enables SWRCB to provide comprehensive protection for California's waters.

Land Disposal Program

SWRCB's Land Disposal program regulates waste discharge to land for treatment, storage, and disposal in waste management units, which include waste piles, surface impoundments, and landfills. CCR Title 23, Chapter 15, contains the regulatory requirements for discharge of hazardous waste to land. The regulations establish waste and site classifications and waste management requirements for waste treatment, storage, or disposal in landfills, surface impoundments, waste piles, and land treatment facilities. The regulations also include minimum standards for proper management of each waste category. In addition, the regulations apply to cleanup and abatement actions for unregulated discharges to land of hazardous waste (e.g., spills).

California Department of Industrial Relations – Division of Occupational Safety and Health

In California, every employer has a legal obligation to provide and maintain a safe and healthful workplace for employees, according to the California Occupational Safety and Health Act of 1973. The Division of Occupational Safety and Health (Cal/OSHA) program is responsible for enforcing California laws and regulations pertaining to workplace safety and health and for providing assistance to employers and workers about workplace safety and health issues. Cal/OSHA regulations are administered through Title 8 of the CCR. The regulations require all manufacturers or importers to assess the hazards of substances that they produce or import and all employers to provide information to their employees about the hazardous substances to which they may be exposed.

California Office of Environmental Health Hazard Assessment

Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted as a ballot initiative in November 1986. The proposition was intended by its authors to protect California citizens and the state's drinking water sources from chemicals known to cause cancer, birth defects, or other reproductive harm and to inform citizens about exposures to such chemicals. Proposition 65 requires the governor to publish, at least annually, a list of chemicals known to the state to cause cancer or reproductive toxicity.

3.6 HAZARDS AND HAZARDOUS MATERIALS

LOCAL

San Bernardino County Fire Department

The San Bernardino County Fire Department, Hazardous Materials Division, is the Certified Unified Program Agency (CUPA) for San Bernardino County. It issues permits to and conducts inspections of businesses that use, store, or handle substantial quantities of hazardous materials and/or waste. The CUPA is charged with the responsibility of conducting compliance inspections for over 7,000 regulated facilities in San Bernardino County. These facilities handle hazardous material, generate or treat a hazardous waste and/or operate an underground storage tank. The CUPA provides a comprehensive environmental management approach to resolve environmental issues. The CUPA utilizes education and enforcement procedures to minimize the potential risk to human health and the environment, while promoting fair business practices. As a CUPA, San Bernardino County Fire Department manages six hazardous material and hazardous waste programs. The CUPA program is designed to consolidate, coordinate, and uniformly and consistently administer permits, inspection activities, and enforcement activities throughout San Bernardino County (with the exception of the City of Victorville).

San Bernardino Environmental Health Services

The County Environmental Health Services is dedicated to improving the quality of life, ensuring public health and safety, and preventing environmental hazards for all residents and visitors through innovation, education, surveillance, enforcement, and community service. For example the Environmental Health Services regulates medical waste generators through inspection.

San Bernardino County General Plan

The San Bernardino County 2007 General Plan includes policies and programs that are intended to address hazards to the public and environment and guide future development in a way that lessen impacts. For instance, the General Plan requires the application of program review and permitting procedures for proposed land uses potentially introducing hazardous substances as well as the inspection of hazardous material handlers and hazardous waste generators.

For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address potential hazards in the county. These policies are designed to guide future development in a way that lessens impacts. These provisions are discussed in more detail in the impact discussions below.

San Bernardino Development Code

Division 2, Land Use Zoning Districts and Allowed Land Uses

Chapter 82.16 (Hazardous Waste Overlay) of the Development Code ensures that hazardous waste facilities are sited in areas that protect public health, safety, welfare, and the environment by buffering hazardous waste facilities so that incompatible uses are not permitted to be developed in the vicinity.

Division 4, Standards for Specific Land Uses and Activities

Chapter 84.11 (Hazardous Waste Facilities) of the Development Code provides provisions that apply to hazardous waste facilities where allowed in compliance with Chapter 82.16 described above. Chapter 84.11 states that an approved Special Use Permit is required for the

establishment of a hazardous waste facility. The purpose of the Special Use Permit shall be to evaluate the operation and monitoring plan of the facility, ensure the facility has adequate measures for monitoring on-going impacts to air quality, groundwater, and environmentally sensitive resources, evaluate the types and quantities of wastes that will be treated or disposed of at the facility, and require periodic inspections of the facility to ensure conditions of approval are implemented and monitored.

3.6.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of hazard-related impacts of the General Plan (San Bernardino County 2006, p. IV-8).

- 1) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- 2) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- 3) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- 4) Be located on a site which is included on a list of hazardous materials sites compiled by Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.
- 5) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area.
- 6) For a project in the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.
- 7) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- 8) Expose people or structures to significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The purpose of the proposed Project is to reduce GHG emissions within the county. Therefore, as determined in the Notice of Preparation and Initial Study for the proposed Project, implementation of the General Plan Amendment, GHG Plan, and Development Code Amendment would not result in a potentially significant impact by creating a hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, nor would the project result in adverse effects related to being located on a listed hazardous materials site. In addition, the Notice of Preparation and Initial Study for the proposed Project determined that impacts associated with hazards resulting from being located near a public or private airport, impacts related to the interference with an adopted emergency response plan,

3.6 HAZARDS AND HAZARDOUS MATERIALS

and impacts involving the exposure of people or structures to wildland fires were all addressed in the General Plan EIR.

The proposed Project does not result in any new development potential or construction of facilities that would increase these types of hazardous conditions beyond what the General Plan EIR considered. Implementation of GHG reduction measures under the proposed Project would be subject to all local, state, and federal policies and standards regarding hazards, airports, emergency response and evacuation plans, and wildfires. These impacts will not be further addressed in the Draft SEIR.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant hazard-related impacts or a substantial increase in severity of previously identified impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's six previously disclosed hazard impacts:

Impacts HAZ-1, 2, 3, and 4 – The General Plan Update may create a significant hazard to the public, sensitive receptors or the environment through the transport, use or disposal of hazardous materials or through the foreseeable release of hazardous materials into the environment. (San Bernardino County 2007c, p. 11)

As identified in the General Plan CEQA Findings, mitigation measures have been incorporated to reduce potential hazard impacts from Impacts HAZ-1, 2, 3, and 4 to less than significant (San Bernardino County 2007c, p. 12).

The following adopted General Plan policies and programs address potential hazards and are designed to guide future development in a way that lessens impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in General Plan EIR directly into the General Plan as policies.

- | | |
|-----------------|--|
| Policy S 2.4 | Protect vital groundwater resources and other natural resources from contamination for present and future beneficial uses. |
| Policy S 2.5 | Minimize the risk of exposure to hazardous substances by residential and other sensitive receptors through the application of program review and permitting procedures. |
| S 2.5 Program 1 | The County shall provide 24-hour response to emergency incidents involving hazardous materials or wastes in order to protect the public and the environment from accidental releases and illegal activities. |
| S 2.5 Program 4 | The County shall inspect hazardous material handlers and hazardous waste generators to ensure full compliance with laws and regulations. |

- S 2.5 Program 5 The County shall implement CUPA programs for the development of accident prevention and emergency plans, proper installation, monitoring, and closure of USTs, and the handling, storage, transportation, and disposal of hazardous wastes.
- S 2.5 Program 6 The County shall conduct investigations and take enforcement action as necessary for illegal hazardous waste disposal or other violations of federal, state, or local hazardous materials laws and regulations.
- S 2.5 Program 7 The County shall manage the investigation and remediation of environmental contamination due to releases from USTs, hazardous waste containers, chemical processes, or the transportation of hazardous materials.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new hazard-related impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts HAZ-1, 2, 3, and 4.

The subsequent projects and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible impacts from hazards and hazardous materials from implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents). In addition, the analysis also considers recently prepared environmental review documents for renewable energy projects in the county to identify potential impacts unique to implementation of the GHG Plan reduction measures.

IMPACTS AND MITIGATION MEASURES

Release of and Exposure to Hazardous Materials

Impact 3.6.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding the release of hazardous materials (General Plan EIR Impacts HAZ-1, 2, 3, 4 and 5). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of hazard impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Implementation of the proposed Project would involve implementation of several GHG reduction measures in order to aggressively reduce GHG emissions in the county. Examples of proposed GHG reduction measures include, but are not limited to, Residential Renewable

3.6 HAZARDS AND HAZARDOUS MATERIALS

Energy Incentives (R2E3), a Warehouse Renewable Incentive Program (R2E4), the installation of solar photovoltaic systems on five County buildings (R2E8-INT), public transit expansion measures (R3T1), the expansion of the vanpool program (R2EC1-INT), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and increased use of combined heat and power systems (R1E6 and R2E3-INT). The implementation of these activities could result in the accidental release of hazardous materials into the environment and/or exposure of the public to hazardous materials via reasonably foreseeable upset conditions. More specifically, reduction measures such as residential and commercial energy efficiency retrofits (R2E1 and R2E2) and community building energy efficiency and conservation for existing buildings (R3E3) could result in remodeling or retrofitting of existing structures, some of which could be a source of asbestos, lead paint and other hazardous materials.

Accidental releases of hazardous materials are those releases that are unforeseen or that result from unforeseen circumstances, while reasonably foreseeable upset conditions are those release or exposure events that can be anticipated and planned for. Facilities that use hazardous materials are required to obtain permits and comply with appropriate local, state, and federal regulatory agency standards designed to avoid hazardous waste releases. These regulations provide a comprehensive regulatory system for handling hazardous materials in a manner that protects human health and the environment. In addition, Chapter 82.16 (Hazardous Waste Overlay) of the Development Code ensures that hazardous waste facilities are sited in areas that protect public health, safety, welfare, and the environment by buffering hazardous waste facilities so that incompatible uses are not permitted to be developed in the vicinity. These requirements would also reduce the number of persons exposed to any hazardous material incidents. As such, both accidental and reasonably foreseeable hazardous materials releases would be expected to occur infrequently and result in minimal hazard to the public or the environment.

Various GHG reduction measures could increase exposure to electrical transformers containing polychlorinated biphenyls (PCBs) that have the potential to pose a health and safety risk via accidental release, misuse, or historic use. In addition, renovation activities potentially associated with certain GHG reduction measures, such as the installation of solar photovoltaic systems on five County buildings (R2E8-INT), could result in exposure to hazardous materials by disturbing and thus releasing asbestos and/or lead during demolition and remodeling activities. Furthermore, reduction measures such as the proposed turnover of the current County automobile fleet to a more energy efficient fleet (R2F1a-INT) could result in the increased handling of electric car batteries. There are six types of electric vehicle batteries: lead-acid, nickel-metal hydride, nickel-cadmium, lithium ion, zinc-air and flywheels. All are composed of metals, though lead-acid batteries are the most environmentally problematic.

Future site-specific environmental review would ensure a reasonable level of safety for workers and users of future development through review and mitigation of site-specific health hazards associated with electrical transformers containing PCBs. In addition, certain GHG reduction measure activities, including potential demolition and remodeling, would be subject to federal state and local regulations specifically aimed at preventing lead and asbestos hazards. For example, USEPA requires contractors or firms performing renovation, repair, and painting projects that disturb lead-based paint in buildings built before 1978 to be certified and to follow specific work practices to prevent lead contamination (USEPA's Renovation, Repair, and Remodeling rule). USEPA has also developed asbestos demolition and renovation requirements in the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation (40 CFR, Part 61, Subpart M). NESHAP includes notification, inspection, and emission control requirements.

Reduction measures R3E9 through R3E14 could involve installation of wind generators that have the potential to interfere with radar signals. Historically, wind projects in the United States have been delayed due to concern about potential interference between wind turbine generators and radar operations, including military, airport, and weather radar. Wind turbine generators can create what is known as "turbine clutter," a phenomenon that occurs when radar signals are bounced off of the moving blades and other parts of the turbines and create false signals that appear as a blacked out area on radar. It is difficult to track planes through turbine clutter. On Doppler (weather) radar, the turbine clutter is translated as a storm.

The Federal Aviation Administration (FAA) has released a Web-based DOD Preliminary Screening Tool for Long Range Radar (LRR), weather (NEXRAD), and Military Operations clearance analyses (BLM/County 2010, p. 3-246). For LRR and NEXRAD, proposed Project site coordinates can be entered into the tool to determine whether the site is in a no-problem area (green zone), a possible problem area (yellow zone), or a definite problem area (red zone). Placement of turbines in yellow or red zones would require further consultation with the FAA and require an aeronautical study. In addition, the Department of Defense (DOD) would evaluate wind projects in the county on a case-by-case basis in coordination with the FAA in order to analysis potential interference with military radar operations and modify design and/or operation to mitigate this conflict.

The General Plan EIR found that hazardous material impacts resulting from the General Plan can be fully mitigated through the adoption of certain mitigation measures. Because federal, state, and local regulations regarding hazardous materials provide a comprehensive regulatory system that would minimize exposure of the public to hazardous materials, both from accidental and reasonably foreseeable releases, impacts resulting from the proposed Project would not increase the severity of hazard impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Wildland Fires

Impact 3.6.2

The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a significant and unavoidable impact regarding wildland fires (General Plan EIR Impacts HAZ-6). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of this impact. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. There is no new or substantially more severe significant impact.**

High fire hazard areas are subject to periodic wildland fires that occur in these areas. Even if structures are built with the most current fire-safe building techniques and standards, these structures may be damaged or destroyed during major wildland fire conflagrations.

The majority of catastrophic wildland fires occur in the Mountain Region of the county. The desert-mountain interface areas of the county, from Pinon Hills easterly to southern Hesperia, south Apple Valley and on to Yucca and Morongo Valleys, also has a history of substantial property loss from wildland fires caused by heavy shrub and grass growth in and around rural residential areas (San Bernardino County, 2006 at page IV-79).

3.6 HAZARDS AND HAZARDOUS MATERIALS

Certain areas in the County are more susceptible to wildland fire risks and hazards due to: (1) the rugged terrain; (2) the types and amounts of vegetation; (3) pathogen infestation that leads to vegetation die-off; (4) climatic factors; and (5) the presence of people and development. In recent history, the Bear Fire burned over 50,000 acres in late 1970 and the Panorama Fire a decade later burned approximately 23,000 acres (San Bernardino County, 2006 at page IV-79). In 2003, the Old Fire and Grand Prix Fire began on different days and eventually joined and combined to burn over 160,000 acres. Over 1,100 homes were destroyed at a cost of almost 50 million dollars (San Bernardino County, 2006 at page IV-79).

Following the 1980 Panorama Fire, several agencies, cities and the County formed a taskforce that prepared the Foothill Communities Protective Greenbelt Program. This program included recommendations that called for a variety of fire-safe measures for residential development and individual building standards. These measures were adopted by the County as fire safety standards and were transformed into a Fire Safety Overlay in the 1989 General Plan. After the fires of 2003, the County made further safety improvements in the Fire Safety Overlay.

Various GHG reduction measures proposed under the project would include roadway modification projects, a number of which involve widening of existing facilities for the purpose of increasing their efficiency. For example, GHG reduction measures include implementation of vehicle miles traveled reduction strategies (R2T2), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4). Such measures would not expose people or structures to significant hazards involving wildland fires.

Reduction measures R3E9 through R3E14 could result in renewable energy generating facilities. However, the GHG Plan does not result in any new development potential or construction of facilities that would increase these types of hazardous conditions beyond what the General Plan EIR considered. Any areas at risk for wildland fire hazards would be required to comply with the 2007 California Fire Code (Title 24, Part 9 of the California Code of Regulations), which requires construction methods that mitigate wildfire exposure be applied in geographical areas where wildfire burning in vegetative fuels may readily transmit fire to buildings and threaten to destroy life, overwhelm fire suppression capabilities, or result in large property losses. The Fire Code establishes minimum standards for materials and material assemblies to provide a reasonable level of exterior wildfire exposure protection for buildings in wildland-urban interface areas and requires the use of ignition-resistant materials and design to resist the intrusion of flame or burning embers projected by a vegetation fire. **Thus, there is no new or substantially more severe significant impact.**

3.7 HYDROLOGY AND WATER QUALITY

This section identifies the hydrologic conditions and groundwater quality in San Bernardino County. This section also evaluates the potential impacts of the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project) with respect to groundwater and identifies the appropriate 2007 General Plan policies and programs, County Code regulations, and mitigation measures that would lessen the identified impacts. The reader is referred to Section 3.9, Public Services and Utilities, regarding further analysis of groundwater/water supply impacts of the proposed Project. The existing setting and analysis in this section utilizes the 2007 San Bernardino County General Plan and its associated Environmental Impact Report, as well as the County of San Bernardino Development Code.

3.7.1 EXISTING SETTING

REGIONAL HYDROLOGY

According to the 2009 California Department of Water Resources California Water Plan Update, the state has been subdivided into ten hydrologic regions. San Bernardino County contains three separate hydrologic regions: the South Coast Hydrologic Region at the southwest corner of the county (Valley Region), the South Lahontan Hydrologic Region generally spanning the northern half of the county, and the Colorado River Hydrologic Region generally spanning the southern half of the county (DWR 2009b).

South Coast Hydrologic Region

The South Coast Hydrologic Region covers 11,000 square miles or 7 percent of the state's total land. It extends from the Pacific Ocean east to the Transverse and Peninsular ranges, and from the Ventura-Santa Barbara county line south to the international border with Mexico. The region includes all of Orange County and portions of Ventura, Los Angeles, San Bernardino, Riverside, and San Diego counties (DWR 2009b, p. SC-3).

There are 19 major rivers and watersheds in the South Coast region. Many of these watersheds have densely urbanized lowlands with concrete-lined channels and dams controlling floodflows. The headwaters for many rivers, however, are within coastal mountain ranges and remain largely undeveloped (DWR 2009b, p. SC-3).

The South Coast Hydrologic Region has 56 delineated groundwater basins. Twenty-one basins are in subregion 4 (Los Angeles), eight basins in subregion 8 (Santa Ana), and 27 basins in subregion 9 (San Diego). Subregion 8 encompasses the southwest corner of San Bernardino County and overlies eight groundwater basins. Groundwater basins underlie 979,000 acres (1,520 square miles) or about 54 percent of the Santa Ana subregion (DWR 2003, p. 148). In some larger basins, groundwater occurs in multiple aquifers separated by aquitards that create confined groundwater conditions. Basins range in depth from tens or hundreds of feet in smaller basins to thousands of feet in larger basins. The thickness of aquifers varies from tens to hundreds of feet. Well yields vary depending on aquifer characteristics and well location, size, and use. Some aquifers are capable of yielding thousands of gallons per minute to municipal wells (DWR 2003, p. 149).

South Lahontan Hydrologic Region

The South Lahontan Hydrologic Region represents about 17 percent of the land area in California. The region includes Inyo County and portions of Mono, San Bernardino, Kern, and Los Angeles counties. It is bounded to the north by the drainage divide between Mono Lake and

3.7 HYDROLOGY AND WATER QUALITY

East Walker River; to the west and south by the Sierra Nevada, San Gabriel, San Bernardino, and Tehachapi mountains; and to the east by the state of Nevada (DWR 2009b, p. SL-3).

Much of the topography of the South Lahontan region reflects its active geologic history. Many prominent mountain ranges and old, dormant volcanoes have cinder cones (steep conical hills of volcanic fragments) and lava flows, especially in the north. In addition to the Sierra Nevada, important ranges include the White Mountains, the Avawatz Mountains, and the Argus and Coso ranges. It is not uncommon to have mountain peaks at or above 10,000 feet above sea level. The mountains are separated by many U-shaped alluvial valleys, some of which are quite large. They include the Owens Valley, Death Valley, Panamint Valley, and Indian Wells Valley. Also, the highest and lowest elevation points in the continental United States are found in the north: Mount Whitney with an elevation of 14,495 feet and Death Valley at 282 feet below sea level. The topography in the south is less mountainous and dominated by large and gently sloping valleys. They include Antelope, Victor, and Apple valleys (DWR 2009b, p. SL-3).

Major lakes and reservoirs in the region include Mono Lake, June Lake, Convict Lake, Crowley Lake, and Tinemaha Reservoir in the north and Lake Arrowhead, Silverwood Lake, and Lake Palmdale in the south. Most of the perennial rivers are in the north and include the Owens River and Rush Creek. In the south, the Mojave and Amargosa rivers are typically dry for most of the year. Water flows in the channels of both rivers after heavy rainfall. In addition, there are two locations on the Mojave River where groundwater is forced to the surface of the channel by geologic conditions. Deep Creek is an important tributary to the Mojave River (DWR 2009b, p. SL-3).

According to the California Department of Water Resources, 76 groundwater basins are delineated in the South Lahontan Hydrologic Region (DWR 2003, p. 193). The groundwater basins underlie about 11.60 million acres (18,100 square miles) or about 55 percent of the region. Most of the groundwater production is concentrated, along with the population, in basins in the southern part of this region, which is in San Bernardino County. Groundwater provides 41 percent of water supply for agriculture and urban uses (DWR 2003, p. 194). Much of this hydrologic region is public land with very low population density; within these areas, there has been little groundwater development and little is known about the basins (DWR 2003, p. 194).

In most smaller basins, groundwater is found in unconfined alluvial aquifers; however, in some of the larger basins, or near dry lakes, aquifers may be separated by aquitards that cause confined groundwater conditions (DWR 2003, p. 194). Depths of the basins range from tens or hundreds of feet in smaller basins to thousands of feet in larger basins. The thickness of aquifers varies from tens to hundreds of feet. Well yields vary in the South Lahontan Hydrologic Region depending on aquifer characteristics and well location, size, and use (DWR 2003, p. 194).

Colorado River Hydrologic Region

The Colorado River Hydrologic Region is located in southeastern California and contains 12 percent of the state's land area. The Colorado River provides most of the eastern boundary, and the border with Mexico forms the southern boundary. The region includes Imperial County and portions of Riverside, San Bernardino, and San Diego counties. The portion of the Colorado River Hydrologic Region within San Bernardino County is part of the Mojave Desert and features small to moderate mountain ranges, dormant volcanos, hills, U-shaped valleys, and the Southern Mojave watershed (DWR 2009b, p. CR-3).

In the Colorado River Hydrologic Region, groundwater provides about 8 percent of the water supply in normal years for agricultural and urban uses (DWR 2003, p. 204). In many of the smaller

basins, groundwater is found in unconfined alluvial aquifers (DWR 2003, p. 204). In some of the larger basins, particularly near dry lakes, aquifers may be separated by aquitards that create confined groundwater conditions. Depths of basins range from tens or hundreds of feet in smaller basins and along arms of ephemeral rivers to thousands of feet in larger basins (DWR 2003, p. 204). The thickness of aquifers varies from tens to hundreds of feet. Well yields vary in the Colorado River Hydrologic Region depending on aquifer characteristics and well location, size, and use. Some aquifers are capable of yielding thousands of gallons per minute to municipal wells (DWR 2003, p. 204).

WATER QUALITY

The term *water quality* is non-specific. That is, the standard applied to the quality of a water source depends on the water use. Thus, varying levels of water quality may be acceptable, depending on whether the water is used for industrial processes, drinking, or irrigation. The most important elements for the economic survival of San Bernardino County are the availability, beneficial use, and conservation of its water (San Bernardino County 2006, Appendix H, p. 6-126).

In California, responsibility for the protection of water quality rests with the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB) (see Regulatory Framework below). Regulation of water quality is made even more complex by the fact that watersheds within San Bernardino County may cross more than one RWQCB jurisdiction (Santa Ana Region, Lahontan Region, and Colorado River Region), have point and/or nonpoint source pollution, and be affected by multiple pollutants, each with different health implications and necessitating different cleanup strategies (San Bernardino County 2006, Appendix H, p. 6-126). The greatest challenge in water quality regulation is the problem of urban runoff (San Bernardino County 2006, Appendix H, p. 6-126).

Sources of Pollution

A major problem with water quality is water pollution. A variety of actions causes, or has the potential to cause, water pollution. In San Bernardino County, a number of water quality improvements are being developed to mitigate negative groundwater quality impacts from nearly a century of agricultural, industrial, and residential point and nonpoint source contributions.

Chemicals of concern include:

- Total dissolved solids (TDS);
- Total inorganic nitrogen such as nitrates;
- Perchlorate;
- Arsenic;
- Pharmaceuticals;
- Methyl tertiary butyl ether (MTBE); and
- Volatile organic compounds.

3.7 HYDROLOGY AND WATER QUALITY

Total Dissolved Solids

Increases in groundwater total dissolved solids (TDS) are a function of the recharge of saline water originating from storm flows, urban runoff, imported water, and incidental recharge. Total dissolved solids are also attributed in part to salt contamination from past and existing agricultural and land uses.

It has been determined that areas with significant irrigated land use or dairy waste disposal histories overlie groundwater with elevated TDS concentrations. Exceptions to this observation are areas where point sources have contributed to TDS degradation, such as the former Kaiser Steel site in Fontana and the former wastewater disposal ponds near Inland Empire Utilities Agency Regional Plant No. 1 in South Ontario (San Bernardino County 2006, Appendix H, p. 6-131).

The TDS impacts of agriculture on groundwater usually originate from fertilizer use on crops, consumptive use, and dairy waste disposal. On an annual basis, the total amount of TDS from manure discharged to the southern half of the basin that will reach groundwater averages about 29,000 tons (San Bernardino County 2006, Appendix H, p. 6-131).

Nitrates

The federal water quality standard for nitrate-nitrogen is set at 10 mg/L. Water containing nitrate concentrations greater than 10 mg/L must either be treated or blended with another water source in order to reduce the nitrate levels. Similar to TDS, areas with significant irrigated land use or dairy waste disposal histories overlie groundwater with elevated nitrate concentrations (San Bernardino County 2006, Appendix H, p. 6-131).

Excessive levels of nitrate in drinking water have caused serious illness and sometimes death. The serious illness in infants is due to the conversion of nitrate to nitrite by the body, which can interfere with the oxygen-carrying capacity of the child's blood. This can be an acute condition in which health deteriorates rapidly over a period of days. Long-term effects from a lifetime of exposure to nitrate at levels above the maximum contaminant level (MCL) include diuresis, increased starchy deposits, and hemorrhaging of the spleen (San Bernardino County 2006, Appendix H, p. 6-131).

The primary areas of nitrate degradation in San Bernardino County are found in the Chino Basin and are the areas formerly or currently overlain by the citrus and dairy industries. Nitrate concentrations in groundwater have increased slightly or remained relatively constant in the areas formerly occupied by citrus groves and vineyards from 1960 to the present. Nitrate concentrations underlying these areas rarely exceed 20 mg/L (as nitrogen). Over the same period, nitrate concentrations have increased significantly in the areas where land use has progressively converted from agriculture to dairy uses, and nitrate concentrations typically exceed the 10 mg/L maximum contaminant level (San Bernardino County 2006, Appendix H, p. 6-131).

Perchlorate

Perchlorate has recently been detected in more than 300 drinking water sources, including in San Bernardino County. Perchlorate had not been detected in groundwater until recently because analytical methodologies did not previously exist that could detect perchlorate at low concentrations. Perchlorate interferes with iodide uptake by the thyroid gland that can result in a decrease in the production of thyroid hormones necessary for prenatal and postnatal growth

and development, as well as for normal body metabolism (San Bernardino County 2006, Appendix H, p. 6-132).

In January 2002, the U.S. Environmental Protection Agency (USEPA) and Department of Health Services (DHS) lowered the provisional action level (PAL) for perchlorate from 18 parts per billion (ppb) to 1 ppb. To understand the scope of the PAL reduction, approximately 45 municipal wells within the Santa Ana River watershed contain traces of perchlorate, of which 11 previously exceeded the prior PAL of 18 ppb. All of these wells exceed the current PAL of 4 ppb. Seventy-five drinking water wells in Riverside and San Bernardino counties alone now exceed the newly established PAL (San Bernardino County 2006, Appendix H, p. 6-132). For example, the Redlands/Crafton plume has levels as high as 77 ppb (San Bernardino County 2006, Appendix H, p. 6-132).

Arsenic

Monitoring results (2000–2004) show that arsenic is ubiquitous in drinking water sources throughout California. Monitoring results also show that peak arsenic levels (based on single detections) greater than 50 micrograms per liter ($\mu\text{g/L}$) were detected in seven sources in four systems in San Bernardino County. Peak levels greater than 10 $\mu\text{g/L}$ were detected in 75 sources in 29 systems in the county.

Pharmaceutical and Personal Care Pollutants

Pharmaceutical and personal care pollutants (PPCP) represent an emerging class of contaminants. These contaminants include caffeine, contraceptives, hormone supplements, painkillers, insect repellent, perfumes, and nicotine. During 1999 and 2000, several California rivers and streams were sampled for these constituents as part of a U.S. Geological Survey (USGS) national reconnaissance effort. These waterbodies include the Sacramento River at Freeport, Cucamonga Creek near Edison, a Turlock Irrigation District Lateral near Patterson, and in San Bernardino County, Cucamonga Creek in Upland (San Bernardino County 2006, Appendix H, p. 6-133).

Eighty-one (81) of the 95 compounds investigated during this study are entirely unregulated. Therefore, little is known about the potential health and environmental effects of PPCP. Wastewater treatment technologies using biological methods or exposure to ultraviolet light are the most probable methods to break down many of the chemicals.

Volatile Organic Compounds

Volatile organic compounds (VOCs) have been detected in the Santa Ana River watershed. Some of the VOCs detected at or above their MCL include:

- 1,1-dichloroethene;
- 1,2-dichloroethane;
- Benzene;
- Tetrachloroethene (PCE);
- Trichloroethene (TCE); and

3.7 HYDROLOGY AND WATER QUALITY

- Vinyl chloride.

VOCs are organic compounds that evaporate readily at room temperature and are commonly used in dry cleaning, paint stripping, metal plating, electronics manufacturing, and machine degreasing, and can be found in motor fuel products such as gasoline. VOCs commonly found in motor fuel products include benzene, ethyl benzene, toluene, xylenes, and trimethylbenzenes. Exposure to VOCs at certain levels represents a potential health hazard to the public (San Bernardino County 2006, Appendix H, p. 6-135).

The primary site locations and toxic constituents identified in the San Bernardino County area are as follows (San Bernardino County 2006, Appendix H, p. 6-135):

- Chino Airport – primarily TCE
- California Institute for Men – primarily TCE and PCE
- General Electric Flatiron Facility – primarily TCE
- General Electric Test Cell Facility – primarily TCE
- Kaiser Steel Fontana Steel Site – primarily TDS and total organic carbon
- Milliken Sanitary Landfill – primarily TCE, PCE, and dichlorodifluoromethane
- Municipal Wastewater Disposal Ponds – primarily TDS and nitrates
- Upland Sanitary Landfill – primarily dichlorodifluoromethane, PCE, TCE, and vinyl chloride

3.7.2 REGULATORY FRAMEWORK

FEDERAL

Clean Water Act

The Clean Water Act (CWA) regulates the water quality of all discharges into waters of the United States including wetlands and perennial and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water quality certification requirements for “any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters.”

Section 303(d) of the Clean Water Act requires that all states in the U.S. identify waterbodies that do not meet specified water quality standards and that do not support intended beneficial uses. Identified waters are placed on the Section 303(d) List of Impaired Waterbodies. Once placed on this list, states are required to develop a water quality control plan — called a Total Maximum Daily Load (TMDL) — for each waterbody and each associated pollutant/stressor. TMDLs are discussed in more detail below.

National Pollutant Discharge Elimination System

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge

pollutants into waters of the United States. It is the responsibility of the regional water quality boards to preserve and enhance the quality of the state's waters through the development of water quality control plans and the issuance of waste discharge requirements (WDRs). WDRs for discharges to surface waters also serve as NPDES permits. There are two general permits for stormwater dischargers, one applying to industrial dischargers and the other relating to construction activities.

NPDES was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that USEPA must consider in setting effluent limits for priority pollutants.

The purpose of the NPDES program is to establish a comprehensive stormwater quality program to manage urban stormwater and minimize pollution of the environment to the maximum extent practicable. The NPDES program consists of (1) characterizing receiving water quality, (2) identifying harmful constituents, (3) targeting potential sources of pollutants, and (4) implementing a Comprehensive Stormwater Management Program (CSWMP).

Individual NPDES Permits

All point source discharges to waters of the United States not covered by a general permit are required to apply for an individual NPDES permit with the Regional Water Quality Control Board (RWQCB). The RWQCB then issues waste discharge requirements and monitoring provisions to ensure compliance with CWA standards. The RWQCB will deny or limit a mixing zone and dilution credit as necessary to protect the beneficial use of state waters.

Federal Flood Insurance Program

Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 with the intent to reduce the need for large publicly funded flood control structures and disaster relief by restricting development on floodplains. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development on floodplains. FEMA issues Flood Insurance Rate Maps (FIRMs) for communities participating in the NFIP. FIRMs delineate flood hazard zones in the community.

STATE

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act governs the coordination and control of water quality in the state and includes provisions relating to non-point source pollution. The California Coastal Commission, pursuant to the Coastal Act, specifies duties regarding the federally approved California Coastal Management Program. This law required that the State Water Resources Control Board, along with the California Coastal Commission, regional boards, and other appropriate state agencies and advisory groups, prepare a detailed program to implement the state's non-point source management plan on or before February 1, 2001. The law also requires that the state board, in consultation with the California Coastal Commission and other agencies, submit copies of prescribed state and regional board reports containing information related to non-point source pollution, on or before August 1 of each year.

3.7 HYDROLOGY AND WATER QUALITY

Department of Water Resources

The Department of Water Resources' major responsibilities include preparing and updating the California Water Plan to guide development and management of the state's water resources, planning, designing, constructing, operating, and maintaining the State Water Resources Development System, regulating dams, providing flood protection, assisting in emergency management to safeguard life and property, educating the public, and serving local water needs by providing technical assistance. In addition, the department cooperates with local agencies on water resources investigations, supports watershed and river restoration programs, encourages water conservation, explores conjunctive use of groundwater and surface water, facilitates voluntary water transfers, and, when needed, operates a state drought water bank.

State Water Resources Control Board

The State Water Resources Control Board is composed of nine Regional Water Quality Control Boards that are responsible for preserving California's water quality. The Regional Water Quality Control Boards (RWQCB) issue waste discharge permits, take enforcement action against violators, and monitor water quality. SWRCB and the Regional Water Quality Control Boards jointly administer most of the federal clean water laws. However, SWRCB retains oversight responsibility and, like USEPA, may intervene if it determines the proposed Project is not in compliance with SWRCB regulations. The SWRCB sets statewide policies and develops regulations for the implementation of water quality control programs mandated by state and federal water quality statutes and regulations. RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. The water quality regulations vary between RWQCBs even in one region.

LOCAL

San Bernardino County Flood Control District

The San Bernardino County Flood Control District was formed in the aftermath of the disastrous March 1938 floods, which took many lives and caused millions of dollars in property damage. The District exercise control over all mainstreams in the County; acquires right-of-way for all main channels, constructs, channels, and has carried out an active program of permanent channel improvements in coordination with the U.S. Army Corps of Engineers. Through the years, the District has been primarily concerned with control of flood waters in major watercourses and channels under the jurisdiction of the District. Due to the vastness of the County, it has been impossible for them to provide assistance to individual property owners Countywide. (San Bernardino County 2006, p. IV-85)

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to address hydrology and water quality related issues and to guide future development in a way that lessens hydrologic impacts. For instance, the General Plan requires program review and permitting procedures for proposed land uses that have the potential to introduce hazardous substances. There is also a provision for the inspection of hazardous material handlers and hazardous waste generators.

For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address hydrology and water quality related impacts in the county. The policies are designed to guide future development in

a way that lessens impacts. These provisions are discussed in more detail in the impact discussions below.

San Bernardino Development Code

Division 2, Land Use Zoning Districts and Allowed Land Uses

Chapter 82.14 of the Development Code provides for greater public safety, promotes public health, and minimizes public and private economic losses due to flood conditions by establishing regulations for development and construction within flood prone areas. The Overlays described in Chapter 82.14 are applied to areas of special flood hazard identified by the FEMA or the Federal Insurance Administration. A project proposed in one of these areas is subject to a Flood Hazard Development Review. This review ensures that the proposed Project complies with this Development Code regarding flood protection measures and requires the submittal of an Elevation Certificate completed by a land surveyor, engineer, or architect who is authorized by State or local law to certify elevation information. In areas where no regulatory floodway has been designated, no new construction, substantial improvement or other development (including fill) is permitted within any flood zone areas designated by FEMA, unless it is demonstrated that the cumulative effect of the proposed development when combined with all other existing and anticipated development will not increase the water surface elevation of the base flood more than one foot at any point within the community.

Division 3, Countywide Development Standards

Chapter 83.10 of the Development Code regulates landscape development in the county and requires that at least 75 percent of the plants selected in non-turf areas be well suited to the climate of the region and require minimal water once established in the landscape. Plants that require similar water needs are mandated to be grouped together and irrigated separately. Native plant materials or locally adaptable drought-tolerant plantings capable of surviving the prevailing climatic and soil conditions with a minimum of supplemental water are emphasized under Chapter 83.10, and in order to reduce evaporation and competition for water, a minimum of three inches of mulch must be added to the soil surface in non-turf areas after planting and within 18 inches of tree trunks.

Division 5, Permit Application and Review Procedures

Chapter 85.07 of the Development Code provides a process for Flood Hazard Development Review. Section 85.11.030 (Soil Erosion Pollution Prevention and Inspection Required) of Chapter 85.11 (Preconstruction Flood Hazard and Soil Erosion Pollution Prevention Inspection) requires a County-approved Soil Erosion Pollution Prevention Plan prior to issuance of any development permit or authorization of any land-disturbing activity of more than 1 acre.

3.7.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of hydrology and water quality impacts of the General Plan (San Bernardino County 2006, p. IV-87).

- 1) Violate any water quality standards or waste discharge requirements.

3.7 HYDROLOGY AND WATER QUALITY

- 2) 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 pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- 3) 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 or siltation on- or off-site.
- 4) 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.
- 5) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- 6) Otherwise substantially degrade water quality.
- 7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- 8) Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- 9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a failure of a levee or dam.
- 10) Inundation by seiche, tsunami, or mudflow.

Based on the analysis provided in the Notice of Preparation and Initial Study, the proposed Project would not result in facilities that would impact water quality beyond what the General Plan EIR considered. Implementation of reduction measures under the GHG Plan would be subject to all of the County development standards regarding water quality. The analysis provided in the Notice of Preparation and Initial Study also found that adverse effects related to the placement of housing within a 100-year flood hazard area, inundation by seiche, tsunami, or mudflow were addressed in the General Plan EIR. The proposed Project does not result in any new development potential or construction of facilities that would trigger additional seiche, tsunami, or mudflow hazards beyond what the General Plan EIR considered. Therefore, these impacts will not be further addressed in the Draft SEIR.

The analysis provided in this section utilizes the significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant hydrology and water quality impacts or a substantial increase in severity of previously identified impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's three previously disclosed hydrology-related impacts:

Impacts HWQ-1, 2, and 3 – Development under the General Plan Update may substantially deplete groundwater supplies, degrade water quality, disrupt existing drainage patterns, and cause the potential for flooding. (San Bernardino County 2007c, p. 13)

As identified in the General Plan CEQA Findings, these impacts were identified as less than significant with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 14). The following adopted General Plan policies and programs address hydrology and water quality and are designed to guide future development in a way that lessens impacts to water resources. The County of San Bernardino elected to implement the mitigation monitoring requirements of the California Environmental Quality Act (CEQA) by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

- | | |
|-------------------|--|
| Policy CI 11.1 | Apply federal and state water quality standards for surface and groundwater and wastewater discharge requirements in the review of development proposals that relate to type, location and size of the proposed Project to safeguard public health. |
| Policy CI 11.6 | Cooperate with state, regional, and responsible authorities to expand water sampling programs to determine ambient groundwater quality conditions affecting public, agricultural, and private wells. Identify the sources, extent, and types of organic and inorganic groundwater contaminants, and evaluate their impacts on groundwater resources. |
| CI 11.6 Program 2 | Work with special districts and other water agencies responsible for delivery of water resources to develop a water resource information system regarding aquifer degradation. Monitor development and consumption trends to assess aquifer stability. |
| Policy CI 11.13 | Prevent surface and groundwater pollution and continue the cleanup of contaminated waters and watersheds. |
| Policy CO 5.1 | Because the San Bernardino County Flood Control District is responsible for debris basin construction and maintenance at the base of the mountains, development in these areas will be coordinated with that agency. |
| Policy CO 5.2 | The County Water Masters will continue to monitor the County's adjudicated groundwater basins to ensure a balanced hydrological system in terms of withdrawal and replenishment of water from groundwater basins. |
| Policy CO 5.3 | The County will promote conservation of water and maximize the use of existing water resources by promoting activities/measures that facilitate the reclamation and reuse of water and wastewater. |

3.7 HYDROLOGY AND WATER QUALITY

- Policy CO 5.4 Drainage courses will be kept in their natural condition to the greatest extent feasible to retain habitat, allow some recharge of groundwater basins and resultant savings. The feasibility of retaining features of existing drainage courses will be determined by evaluating the engineering feasibility and overall costs of the improvements to the drainage courses balanced with the extent of the retention of existing habitat and recharge potential.
- CO 5.4 Program 8 Establish an economically viable flood control system by utilizing channel designs including combinations of earthen landscaped swales, rock rip-rap-lined channels, or rock-lined concrete channels. Where adjacent to development, said drainage will be covered by an adequate County drainage easement with appropriate building setbacks established there from.
- Policy M/CO 3.7 Discourage the extraction and exportation of native groundwater for commercial purposes due to limited groundwater resources coupled with the increasing demands on this precious resource.
- Policy M/CO 3.8 Coordinate with Mountain wastewater and water agencies in establishing programs designed to use reclaimed wastewater from Mountain sewage systems to recharge the local groundwater basins when consistent with County public health and environmental standards.
- Policy M/CO 3.9 Support and apply water conservation and reuse measures through the development review process.
- Policy S 2.4 Protect vital groundwater resources and other natural resources from contamination for present and future beneficial uses.
- Policy S 5.1 Participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains.
- S 5.1 Program 1 Designate Floodway and Floodplain areas, as identified by the Federal Emergency Management Agency (FEMA) on flood insurance rate maps and flood boundary maps, as Floodway (FW) on the Land Use Maps and Floodplain Overlays on the Hazards Overlay Maps.
- S 5.1 Program 2 Designated floodway areas will be preserved for non-structural uses through restrictions of the FW Land Use Zoning District.
- S 5.1 Program 3 All new development, including filling, grading, and construction, proposed within designated floodplains, will require submission of a written assessment prepared by a qualified hydrologist or engineer, in accordance with the latest "San Bernardino County Hydrology Manual" and the various detention basin policies, to determine whether the development will significantly increase flood hazard and to show that all new structures will be adequately protected. Development will be conditioned on receiving approval of this assessment by the San Bernardino County Surveyor Division of the Public Works Department.

- S 5.1 Program 4 All new construction in a Floodplain Overlay area will be required to be flood-proofed, located, and designed to allow unrestricted flow of floodwaters.
- S 5.1 Program 5 The Land Use Compatibility Chart for 100-Year Flood Plains (Table S-1 of General Plan) will apply to County reviews of all discretionary and ministerial actions in County-designated floodplains.
- S 5.1 Program 6 Lands within floodplain areas may be developed with non-critical and non-essential uses if mitigation measures are incorporated to ensure that the proposed development will not be hazardous, increase flood depths or velocities downstream, or degrade water quality, especially uses such as parks, trails, and open space.
- S 5.1 Program 7 Provide known flood hazard information with every discretionary or ministerial application.
- S 5.1 Program 8 When no mapped data exist, existing topographical, watershed, and drainage course data will be evaluated for a determination of potential flood hazard for every discretionary and ministerial action.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new hydrology-related impact not previously addressed in the General Plan EIR or an increased severity of previously identified General Plan EIR Impacts HWQ-1, 2, and 3.

The exact subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible hydrologic impacts from the implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for greenhouse gas (GHG) emission reduction (functional equivalent documents); see Section 3.0 for a description of these documents.

IMPACTS AND MITIGATION MEASURES

Deplete Groundwater Supplies or Interfere with Groundwater Recharge

Impact 3.7.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to groundwater supplies and groundwater recharge (General Plan EIR Impact HWQ-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of groundwater impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

3.7 HYDROLOGY AND WATER QUALITY

Implementation of certain GHG reduction measures proposed under the project could result in both short- and long-term impacts to the County's water supply. During grading activities, water would be needed to suppress fugitive dust generated by construction equipment. It is possible that more than one project could be constructed simultaneously in areas with impacted groundwater basins. GHG reduction measures of the proposed Project, particularly roadway improvements including signal synchronization and traffic flow management (R2T4) and new high-occupancy vehicle lanes (R2T8) are not likely to affect groundwater supplies by incrementally reducing groundwater recharge potential, because they would be implemented in areas where development already occurs. General Plan Policy CO 5.2 requires continued monitoring of the county's adjudicated groundwater basins to ensure a balanced hydrological system in terms of withdrawal and replenishment of water from groundwater basins. Most of the GHG reduction measure projects involve modification of existing facilities.

Reduction measures R3E9 through R3E14 could result in renewable energy generating facilities, which may require water for solar power plant cooling (or cleaning of solar panels) or wind turbine operational needs. Water supply needs for wind and solar projects generally tend to be minor and are often less than the agricultural use of the land [see Kramer Junction Solar Energy Center Project Initial Study (San Bernardino County 2010a, p. 55) and Granite Mountain Wind Energy Project Draft EIS/EIR (BLM/County 2010, p. 3-237)]. In addition, these renewable energy generating facilities do not involve substantial land coverage that would alter the infiltration capability of the land [see Kramer Junction Solar Energy Center Project Initial Study (San Bernardino County 2010a, pp. 40-41) and Granite Mountain Wind Energy Project Draft EIS/EIR (BLM/County 2010, p. 3-181)].

Based on review of the California Energy Commission's California Wind Resource Potential Map as well as the Draft Staff Report California Solar Resources (see page 18), large portions of the county have potential for renewable energy generating facilities. Although these facilities could result in substantial groundwater demand, Article X, Section 2 of the California Constitution declares, "the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented..." In order to better define what "unreasonable use" means in terms of power plant cooling, SWRCB issued Resolution 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (Resolution 75-58). It sets forth, in priority order, a list of preferable water sources for power plant cooling as follows: (1) wastewater being discharged to the ocean, (2) ocean, (3) brackish water from natural sources or irrigation return flow, (4) inland wastewaters of low TDS, and (5) other inland waters. The resolution also states that fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. Therefore, it is unlikely that the development of large renewable energy generating projects (subject to CEC licensing) located in San Bernardino County would extract potable groundwater for cooling purposes. Additionally, the California Energy Commission's 2003 IEPR Integrated Energy Policy Report states that "the Energy Commission would approve the use of fresh water for cooling purposes by power plants which it licenses only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound.' "

Chapter 83.10 of the Development Code regulates landscape development in the county and requires that at least 75 percent of the plants selected in non-turf areas be well suited to the climate of the region and require minimal water once established in the landscape. Plants that require similar water needs are mandated to be grouped together and irrigated separately. Native plant materials or locally adaptable drought-tolerant plantings capable of surviving the prevailing climatic and soil conditions with a minimum of supplemental water are emphasized

under Chapter 83.10, and in order to reduce evaporation and competition for water a minimum of 3 inches of mulch must be added to the soil surface in non-turf areas after planting and within 18 inches of tree trunks. The requirements of Chapter 83.10 will ensure that each implemented GHG reduction measure project ensures that low- water-use landscaping is installed.

Based on the analysis above, the proposed Project would not increase the severity of groundwater resource impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Groundwater Quality

Impact 3.7.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to groundwater quality (General Plan EIR Impact HWQ-2). Implementation of the proposed Project could result in increased erosion and stormwater runoff, which could degrade groundwater quality. Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of groundwater quality impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Long-term implementation of the proposed Project could add impervious surfaces that could impact water quality through discharge of pollutants into groundwater basins. The County General Plan includes policies and programs that address potential impacts to water quality. Policy CI 11.1 requires new development to apply federal and state water quality standards for surface and groundwater and wastewater discharge requirements in the review of development proposals that relate to type, location, and size of the proposed Project to safeguard public health. CI 11.6 Program 1 establishes setbacks from ephemeral and perennial streams regulating impervious or potentially polluting uses.

In addition, Section 85.11.030 of the Development Code states that a Soil Erosion Pollution Prevention Plan is to be approved by the County Building Official prior to issuance of any development permit or authorization of any land-disturbing activity of more than 1 acre. Projects disturbing more than 1 acre are also required to have coverage under the State General Construction Permit issued by the State Water Resources Control Board and develop a stormwater pollution prevention plan (SWPPP). The property owner is required to abide by all provisions of the State General Construction Permit and obtain a Waste Discharge Identification (WDID) number prior to the issuance of building or grading permits when the disturbance is more than 1 acre. The provisions of Development Code Section 85.11.030 were enacted to control soil erosion pollution and the potential for incremental long-term degradation of water quality. In addition, at the time of specific project-level environmental review, the County will ensure compliance with Section 85.11.030 of the Development Code to reduce impacts.

Based on the analysis above, the proposed Project would not increase the severity of groundwater quality impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Drainage and Flooding

Impact 3.7.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to drainage and flooding issues (General Plan EIR Impact HWQ-2 and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of drainage and flooding impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Individual GHG reduction measures implemented in low-lying areas may be subject to flood hazards, or could result in the placement of structures that would impede or redirect flood flows. The effects of flooding could include temporary inundation of a facility that impedes its use or causes long-term damage to the facility; immediate damage to roadways, bikeways, and bridges, typically those adjacent to rising rivers or streams, and particularly during high velocity flood events that wash away or erode facilities; and/or, people or structures could be exposed to flood hazard in the event of dam or levee failure. Indirect impacts of flooding include threats to lives or property, including cars or bicycles parked adjacent to flooded facilities. Lives can be threatened if individuals venture onto flooded or flood-damaged facilities.

At the time of specific project-level environmental review, the County will ensure individual project compliance with General Plan policies and programs which ensure flood hazards are identified, addressed and mitigated. For instance, General Plan Policy S 5.1 mandates that the County participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains and S 5.1 Program 1 designates Floodway and Floodplain areas, as identified by the FEMA on flood insurance rate maps and flood boundary maps. These two provisions provide that flood prone areas are identified and recognized ahead of any development.

Chapter 82.14 of the Development Code establishes regulations for development and construction within flood prone areas. The Overlays described in Chapter 82.14 are applied to areas of special flood hazard identified by FEMA on flood insurance rate maps and flood boundary maps or the Federal Insurance Administration. Any project proposed in one of these areas is subject to a Flood Hazard Development Review. This review ensures that the proposed Project complies with this Development Code regarding flood protection measures and requires the submittal of an Elevation Certificate completed by a land surveyor, engineer, or architect who is authorized by State or local law to certify elevation information.

In addition, General Plan provision S 5.1 Program 2 states that designated floodway areas will be preserved for non-structural uses through restrictions of the Flood Way Land Use Zoning District. S 5.1 Program 3 states that all new development, including filling, grading, and construction, proposed within designated floodplains, will require submission of a written assessment prepared by a qualified hydrologist or engineer, in accordance with the latest "San Bernardino County Hydrology Manual" and the various detention basin policies, to determine whether the development will significantly increase flood hazards and to show that all new structures will be adequately protected. S 5.1 Program 3 further states that development will be conditioned on

receiving approval of this assessment by the San Bernardino County Surveyor Division of the Public Works Department.

As mandated by the General Plan, all new construction in a Floodplain Overlay area will be required to be flood-proofed, located, and designed to allow unrestricted flow of floodwaters (§ 5.1 Program 4), and the County Land Use Compatibility Chart for 100-Year Flood Plains (Table S-1 of General Plan) will apply to County reviews of all discretionary and ministerial actions in County-designated floodplains (§ 5.1 Program 5).

The San Bernardino County Flood Control District is the responsible agency for the planning, design, operations and maintenance of the current and future stormwater and/or flood control system. According to the General Plan EIR, any type of proposed development within these land areas shall be coordinated with this agency (San Bernardino County 2006, p. IV-85). Such coordination ensures that adequate drainage facilities are provided for all new development.

The General Plan EIR determined that implementation of the General Plan would result in a less than significant impact to drainage and flooding issues (General Plan EIR Impact HWQ-2 and 3). The reduction measures proposed as part of the project does not result in any new development potential or construction of facilities that would trigger additional flooding and drainage hazards beyond what the General Plan EIR considered because implementation of individual reduction measure projects and activities under the GHG Plan would be subject to all of the County development standards regarding drainage and placement of structures within the 100-year floodplain, as described above. **Thus, there is no new or substantially more severe significant impact.**

3.8 NOISE

This section describes terminology used to discuss noise and describes the ambient noise environment of the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). Construction noise, traffic noise, operational noise, and other noise impacts associated with implementation of the proposed Project are analyzed in this section. The existing setting and analysis in this section utilizes the 2007 San Bernardino County General Plan and its associated Environmental Impact Report, as well as the County of San Bernardino Development Code.

3.8.1 EXISTING SETTING

Focusing on unincorporated areas of San Bernardino County, noise-sensitive receptors include convalescent homes, hospitals, day-care centers, residential areas, fire stations, schools, hotels, libraries, and campgrounds. Since hotels and most fire stations contain sleeping quarters, they are classified as noise-sensitive receptors. Potential major noise generators include roadways, airports, industrial plants, railroads, racetracks, off-highway vehicle areas, and public shooting ranges (San Bernardino County 2006, p. IV-109). Noise-sensitive land uses are generally considered to include those uses that would result in noise exposure that could cause health-related risks to individuals. Places where quiet is essential are also considered noise-sensitive uses. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. School classrooms, places of assembly, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The unincorporated portions of the county represent the full range of community noise environments from very quiet rural to moderately noisy suburban to noisy urban. Noise patterns in the county are generally consistent with published data regarding the intensity of development/type of land use and the expected levels of environmental noise (San Bernardino County 2006, p. IV-109).

NOISE SOURCES

Noise issues associated with stationary and transportation sources in the county are discussed below.

Stationary Sources

Stationary noise sources include industrial and commercial land uses. Many industrial processes produce noise, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (i.e., regulations of the Occupational Safety and Health Administration of the U.S. Department of Labor [OSHA] and the California Division of Occupational Safety and Health [Cal/OSHA]). Exterior noise levels that affect neighboring parcels are typically subject to local standards. Commercial, recreational, and public facility activities can also produce noise that may affect adjacent noise-sensitive land uses. These noise sources can be continuous or intermittent and may contain tonal components that are annoying to individuals who live nearby. For instance, emergency-use sirens and backup alarms are often considered nuisance noise sources, but may not occur frequently enough to be considered incompatible with noise-sensitive land uses. In addition, noise generation from fixed noise sources may vary based upon climate conditions, time of day, and existing ambient noise levels.

3.8 NOISE

From a land use planning perspective, fixed-source noise control issues focus on two goals: (1) preventing the introduction of new noise-producing uses in noise-sensitive areas; and (2) preventing encroachment of noise-sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise performance standards to proposed new noise producing uses. The second goal can be met by requiring that new noise-sensitive uses near noise-producing facilities include mitigation measures to ensure compliance with noise performance standards. Each of these goals stresses the importance of avoiding the location of new uses that may be incompatible with adjoining uses.

Transportation Sources

The level of noise associated with roadways will vary with total traffic volume, vehicular speed, the relative numbers of trucks and cars in the traffic volumes, the roadway cross-section and geometric design, and the local topography. Typically, the greater the vehicle speed and truck percentage, the greater the level of noise emission from the transportation facility (San Bernardino County 2006, Appendix I, p. 4-20).

Various types of surface transportation facilities exist within the unincorporated portion of San Bernardino County. These facilities include California and interstate limited-access freeways, state-designated routes and highways, plus local jurisdiction roads.

3.8.2 REGULATORY FRAMEWORK

Federal, state, and local governments have established noise standards and guidelines to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise. Those regulations most applicable to the community are summarized below.

FEDERAL

Noise Control Act of 1972

The Noise Control Act of 1972 directed the United States Environmental Protection Agency (USEPA) to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The act directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations. It also required that USEPA establish criterion for noise level adequate to protect health and welfare with an adequate margin of safety but without regard to cost or feasibility. In addition, USEPA was given the responsibility for coordinating federal research and activities related to noise control and for establishing federal noise emission standards for selected products distributed in interstate commerce. The Noise Control Act was subsequently amended by the Quiet Communities Act of 1978, which encouraged the development of noise control programs at the state and community level (Caltrans 2002a)

U.S. Environmental Protection Agency

A report published in 1974 by USEPA, Office of Noise Abatement and Control, continues to be a source of useful background information. Entitled Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, this report is better known as the levels document. The document is intended to provide state and local governments as well as the federal government and the private sector with an informational point of departure for the purposes of decision-making. The document states that undue

interference with activity and annoyance will not occur if outdoor noise levels in residential areas are below a day-night average (L_{dn}) noise level of 55 dBA (decibel) and indoor levels are below 45 dBA L_{dn} . Allowing for an average 15 dBA reduction in sound level between outdoors and indoors (with windows partially open), the interior noise level of 45 dBA L_{dn} would equate to an exterior noise level of 60 dBA L_{dn} . An exterior noise level of 60 dBA L_{dn} would allow normal conversation at distances up to 2 meters with 95 percent sentence intelligibility. In addition, various correction factors can be applied to account for the intrusiveness of the noise source, as well as site-specific and meteorological conditions (USEPA 1974).

LOCAL

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to reduce noise impacts. For instance, the General Plan promulgates and implements noise policies and requirements for construction projects by requiring construction to provide specific noise analyses and implement any necessary measures to reduce noise to an acceptable level. Specific techniques may include, but are not limited to, restrictions on construction timing, use of sound blankets on construction equipment, and the use of temporary walls and noise barriers to block and deflect noise. The General Plan also enforces the hourly noise-level performance standards for locally regulated sources, such as construction activities and mechanical and electrical equipment. For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address noise impacts in the county. These policies are designed to guide future development in a way that lessens impacts from noise. These provisions are discussed in more detail in the impact discussions below.

San Bernardino County Development Code

Division 2, Land Use Zoning Districts and Allowed Land Uses

Chapter 82.18 of the Development Code establishes noise hazard overlays to provide greater public safety by establishing land use review procedures and requirements for land uses in areas with identified high noise levels. Noise hazard overlays are applied to those areas where the day-night average (L_{dn}) is 65 decibels, 65 dBA or greater. When a land use application or development permit is proposed within a noise hazard overlay, a set of standards is applied to ensure noise impacts do not negatively affect sensitive receptors.

Division 3, Countywide Development Standards

The County regulates noise from sources that are not preempted by state or federal jurisdiction. Such sources include project construction activities, stationary sources such as fans, pumps, compressors, or other mechanical equipment, or mobile sources operating on private property. Section 83.01.080 of Chapter 83.01 of the Development Code sets forth performance standards for affected (receiving) land uses from stationary and mobile sources, during daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) periods. Exemptions from these standards include motor vehicles not under the control of the industrial use, emergency equipment, vehicles and devices, and temporary construction and repair or demolition activities taking place between the hours of 7 AM and 7 PM Monday through Saturday, excluding federal holidays.

Section 83.01.090 of Chapter 83.01 establishes a vibration standard in the county. It provides that no ground vibration is allowed that can be felt without the aid of instruments at or beyond the

3.8 NOISE

lot line, nor is any vibration allowed that produces a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line. Vibration velocity is measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings are to be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial, and industrial land use zoning district.

3.8.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of noise impacts of the General Plan (San Bernardino County 2006, p. IV-110).

- 1) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies.
- 2) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- 3) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- 4) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- 5) Expose people residing or working in the project area to excessive noise levels for a project located within an airport land use plan area or, where such a plan has not been adopted, or within 2 miles of a public airport or a public use airport.
- 6) Expose people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip.

Based on the analysis provided in the Notice of Preparation and Initial Study, the proposed Project would not result in adverse impacts associated with airport noise as these impacts were addressed in the previous environmental documents prepared for the General Plan EIR. The General Plan EIR found that development of the unincorporated county would result in a less than significant impact to sensitive receptors due to airport noise with the implementation of mitigation measures. The GHG Plan would not alter land uses in the vicinity of public or private airports that could expose people to airport noise. This issue will not be addressed further in this Draft SEIR.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant noise impacts or a substantial increase in severity of previously identified noise impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's three previously disclosed noise impacts:

Impacts N-1, 2, and 3 – Development under the updated General Plan will increase ambient noise levels mainly from increased vehicular traffic and new commercial or industrial sources that could cause established noise standards to be exceeded. (San Bernardino County 2007c, p. 16)

As identified in the General Plan CEQA Findings, these impacts were identified as less than significant with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 16).

The analysis of noise impacts considers the effects of temporary construction-related noise, long-term operational noise, and groundborne vibration impacts associated with greenhouse gas (GHG) reduction measures in light of analysis provided in the General Plan EIR. The analysis recognizes the programmatic nature of the proposed Project; therefore, it focuses on the potential implications of the proposed GHG reduction measures and not on the individual project-level effects of specific projects.

The following adopted General Plan policies and programs address noise issues and are designed to guide future development in a way that lessens noise-related impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of the California Environmental Quality Act (CEQA) by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

- | | |
|-----------------|---|
| Policy N 1.1 | Designate areas within San Bernardino County as "noise impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Chapter 83.01 of the Development Code. |
| Policy N 1.3 | When industrial, commercial, or other land uses, including locally regulated noise sources, are proposed for areas containing noise-sensitive land uses, noise levels generated by the proposed use will not exceed the performance standards of Table N-2 within outdoor activity areas. If outdoor activity areas have not yet been determined, noise levels shall not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for residential or other noise-sensitive land uses. |
| N 1.3 Program 1 | Require an acoustical analysis prior to approval of proposed development of new residential or other noise-sensitive land uses in a noise-impacted area or a new noise generating use in an area that could affect existing noise-sensitive land uses. The appropriate time for requiring an acoustical analysis is during the environmental review process so that noise mitigation may be an integral part of the project design. The acoustical analysis shall: <ul style="list-style-type: none"> a. Be the responsibility of the applicant. |

3.8 NOISE

- b. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
 - c. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions;
 - d. Include estimated noise levels in terms of the descriptors shown in Figures II-8 and II-9 of the Noise Background Report for existing and projected future (20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
 - e. Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.
 - f. Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, acoustical information to support a statement of overriding considerations for the project must be provided.
- N 1.3 Program 2 Develop and employ procedures to ensure that requirements imposed pursuant to the finding of an acoustical analysis are implemented as part of the project review and building permit processes.
- Policy N 1.5 Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.
- Policy N 1.6 Enforce the hourly noise-level performance standards for stationary and other locally regulated sources, such as industrial, recreational, and construction activities as well as mechanical and electrical equipment.
- N 1.7 Program 3 Provide sufficient noise exposure information so that existing and potential noise impacts will be identified and addressed in the project review processes.
- N 1.7 Program 4 Compile and publish a list of standardized noise mitigation measures.
- Policy N 2.1 The County will require appropriate and feasible on-site noise attenuating measures that may include noise walls, enclosure of noise-generating equipment, site planning to locate noise sources away from sensitive receptors, and other comparable features.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts N-1, 2, and 3.

Specific subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Therefore, this analysis uses a programmatic approach in evaluating possible noise impacts of implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents). The analysis also considers recently prepared environmental review documents for renewable energy projects in the county to identify potential impacts unique to implementation of the GHG Plan reduction measures.

IMPACTS AND MITIGATION MEASURES

Short-Term Construction Noise

Impact 3.8.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in less than significant impacts from noise (General Plan EIR Impact N-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of construction noise impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Many of the GHG reduction measures, such as public transit expansion measures (R3T1), the expansion of the vanpool program (R2EC1-INT), the installation of solar photovoltaic systems on five County buildings (R2E8-INT), and increased use of combined heat and power systems (R2E3-INT), are not expected to generate significant short-term noise-related impacts because they are minor upgrades to existing infrastructure and/or County programs. There are, however, other GHG reduction measures that would involve grading and paving or the construction of permanent facilities.

The operation of heavy equipment during the construction of infrastructure associated with various GHG reduction measures would result in temporary increases in noise in the immediate vicinity of individual construction sites. During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. **Table 3.8-2** summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects.

3.8 NOISE

**TABLE 3.8-1
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS**

Equipment	Typical Noise Level (dBA) at 50 Feet from Source		Distance to Noise Contours (Feet)		
	L _{max}	L _{eq}	70 dBA	65 dBA	60 dBA
Air Compressor	80	76	105	187	334
Auger/Rock Drill	85	78	133	236	420
Backhoe/Front End Loader	80	76	105	187	334
Blasting	94	74	83	149	265
Boring Hydraulic Jack/Power Unit	80	77	118	210	374
Compactor (Ground)	80	73	74	133	236
Concrete Mixer Truck	85	81	187	334	594
Concrete Mixer (Vibratory)	80	73	74	133	236
Concrete Pump Truck	82	75	94	167	297
Concrete Saw	90	83	236	420	748
Crane	85	77	118	210	374
Dozer/Grader/Excavator/ Scraper	85	81	187	334	594
Drill Rig Truck	84	77	118	210	374
Generator	82	79	149	265	472
Gradall	85	81	187	334	594
Hydraulic Break Ram	90	80	167	297	529
Jack Hammer	85	78	133	236	420
Impact Hammer/Hoe Ram (Mounted)	90	83	236	420	748
Pavement Scarifier/Roller	85	78	133	236	420
Paver	85	82	210	374	667
Pile Driver (Impact/Vibratory)	95	88	420	748	1,330
Pneumatic Tools	85	82	210	374	667
Pumps	77	74	83	149	265
Truck (Dump/Flat Bed)	84	80	167	297	529

Source: FHWA 2006

As shown in **Table 3.8-1**, maximum intermittent noise levels associated with construction equipment typically range from approximately 77 to 95 dBA L_{max} at 50 feet (L_{max} is the maximum A-weighted noise level recorded for a single noise). Pile driving and demolition activities involving the use of pavement breakers and jackhammers are among the noisiest activities associated with construction projects. Depending on equipment usage and duration, average-hourly equipment noise levels typically range from approximately 73 to 88 dBA L_{eq} at 50 feet. (L_{eq} represents the Equivalent Continuous Noise Level) Noise levels from point sources such as construction sites typically attenuate at a rate of about 6 dBA per doubling of distance. Based on this attenuation rate and assuming a maximum noise level of approximately 88 dBA L_{eq} at 50

feet, average construction noise levels would be reduced to approximately 65 dBA L_{eq} at approximately 700 feet from a construction site. Predicted noise levels would vary depending on multiple factors, such as the number and type of equipment used, equipment usage rates, area of activity, and shielding provided by intervening terrain and structures. Delivery vehicles, construction employee vehicle trips, and haul truck trips may also contribute to overall construction noise levels. Although construction-generated noise levels would be short term, significant increases in ambient noise levels at nearby noise-sensitive land uses could potentially occur. For noise-sensitive land uses, such as residential dwellings, activities occurring during the more noise-sensitive evening and nighttime hours are of particular concern. Construction activities occurring during these more noise-sensitive hours may result in increased levels of annoyance and potential sleep disruption to occupants of nearby residential dwellings.

Section 83.01.080 of the Development Code sets forth performance standards for affected (receiving) land uses from noise sources, during daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) periods. Exemptions from these standards include temporary construction and repair or demolition activities taking place between the hours of 7 AM and 7 PM Monday through Saturday, yet for nighttime periods there are no exemptions, thus limiting construction activities to daytime periods.

In addition, the County has promulgated and implemented noise policies and requirements for construction projects by requiring construction to provide specific noise analyses and implement any necessary measures to reduce noise to an acceptable level (N 1.3 Program 1 and N 1.3 Program 2). Specific techniques may include, but are not limited to, restrictions on construction timing, use of sound blankets on construction equipment, the use of temporary walls and noise barriers to block and deflect noise, and as mentioned above, the use of steam blow piping silencers. Policy N 1.6 enforces the hourly noise-level performance standards for locally regulated sources, such as construction activities and mechanical and electrical equipment.

These policy provisions are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document for Renewable Electricity Standard (CARB 2010f), which addresses impacts resulting from future renewable electricity standard projects (i.e., alternative energy generation projects). The Functional Equivalent Document for Renewable Electricity Standard identified limiting noisy construction activities to the least noise-sensitive times of the day, muffling construction equipment, and the consideration of temporary noise barriers as acceptable construction-related noise mitigation.

Due to the short-term nature of construction noise, the intermittent frequency of construction noise, and required compliance with the construction noise standards established as part of the County Code and General Plan policy provisions noted above, construction noise level increases will not result in a substantial temporary or periodic increase in ambient noise levels in the county above existing levels that would result in exposure of persons to or generation of noise levels in excess of standards established. New construction noise from the proposed Project would not result in a new impact that was not addressed in General Plan EIR or increase the severity of a significant impact identified in the General Plan EIR. Therefore, through the implementation of the aforementioned policies, implementation of the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR or a new impact. **Thus, there is no new or substantially more severe significant impact.**

Groundborne Vibration

Impact 3.8.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in less than significant

3.8 NOISE

impacts from noise impacts (General Plan EIR Impacts N-1 and 2). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of vibration impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. The effects of ground vibration are influenced by the duration of the vibration and the distance from the vibration source.

There are no federal, state, or local regulatory standards for vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, the California Department of Transportation (Caltrans) has developed vibration criteria based on human perception and structural damage risks. For most structures, Caltrans considers a peak-particle velocity (ppv) threshold of 0.2 inches per second (in/sec) to be the level at which architectural damage (i.e., minor cracking of plaster walls and ceilings) to normal structures may occur. Below 0.10 in/sec there is virtually no risk of architectural damage to normal buildings. In terms of human annoyance, continuous vibrations in excess of 0.1 in/sec ppv are identified by Caltrans as the minimum level perceptible level for ground vibration. Short periods of ground vibration in excess of 0.2 in/sec ppv can be expected to result in increased levels of annoyance to people in buildings (Caltrans 2002b).

Long-Term Operation

Many of the proposed GHG reduction measures, such as public transit expansion measures (R3T1), the expansion of the vanpool program (R2EC1-INT), the installation of solar photovoltaic systems on five County buildings (R2E8-INT), and increased use of combined heat and power systems (R2E3-INT), are not expected to generate significant noise impacts because they are minor upgrades to existing infrastructure and/or County programs. GHG reduction measures, such as the implementation of vehicle miles traveled reduction strategies (R2T2), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4), could result in increased groundborne vibration and noise levels associated with transportation sources, such as roadway traffic. Groundborne vibration and noise levels associated with transportation sources are considered to pose no threat to buildings, and potential annoyance to people would be minimal. Traffic vibration levels associated with on-road vehicles are typically highest associated with truck passbys. Automobile traffic normally generates vibration peaks of one-fifth to one-tenth that of trucks. Based on measurements conducted by Caltrans, even the highest truck-generated vibrations, which were measured at approximately 16 feet from the centerline of the near travel lane, were not found to exceed 0.08 in/sec (Caltrans 2002b). This level coincides with the maximum recommended "safe level" for ruins and historical structures (Caltrans 2002b). For these reasons, long-term exposure to groundborne vibration resulting from implementation of the proposed Project related to roadway and transit facility improvements would not be anticipated to exceed applicable groundborne vibration criteria.

Construction Activities

With the exception of pavement breaking, blasting, and pile driving, construction activities and related equipment typically generate groundborne vibration levels of less than 0.20 in/sec, which is the architectural damage risk threshold recommended by Caltrans. Based on Caltrans measurement data, use of off-road tractors, dozers, earthmovers, and haul trucks generates groundborne vibration levels of less than 0.10 in/sec or one half of the architectural damage risk level, at 10 feet (Caltrans 2002b). The highest vibration level associated with a pavement breaker was 2.88 in/sec at 10 feet (Caltrans 2002b). During pile driving, vibration levels near the source depend mainly on the soil's penetration resistance as well as the type of pile driver used. Impact pile drivers tend to generate higher vibration levels than vibratory or drilled piles. Groundborne vibration levels of pile drivers can range from approximately 1 to 1.5 in/sec ppv (Caltrans 2002b). As with construction-generated noise levels, pile driving can result in a high potential for human annoyance from vibrations, and pile-driving activities are typically considered as potentially significant if these activities are performed within 200 feet of occupied structures (Caltrans 2002b). Vibration levels associated with blasting are highly variable, site-specific, and dependent on various factors, such as the amount of explosive used, soil conditions between the blast site and the receptor, and the depth where blasting would take place. Blasting that occurs below the surface would typically produce lower vibration levels due to additional attenuation provided by distance to the receptor and transmission through soil and rock.

Section 83.01.080 of the Development Code establishes hourly restrictions and noise standards pertaining to construction-related activities that would address vibration impacts as well. In addition, Development Code Section 83.01.090 establishes a vibration standard in the county. No ground vibration is allowed that can be felt without the aid of instruments at or beyond the lot line, nor is any vibration allowed which produces a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line. Vibration velocity is measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings are to be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial, and industrial land use zoning district.

Furthermore, the County has noise policies and code requirements for construction projects by requiring construction to provide specific noise impact analyses and implement any necessary measures to reduce noise-related impacts to an acceptable level (N 1.3 Program 1 and N 1.3 Program 2). Specific techniques may include, but are not limited to, restrictions on construction timing and/or use of sound blankets on construction equipment. Policy N 1.6 enforces the hourly noise-level performance standards for locally regulated sources, such as construction activities and mechanical and electrical equipment.

Due to the short-term nature of construction vibrations, the intermittent frequency of construction vibrations, and the required compliance with the County Development Code's hourly restrictions for construction-related activities and vibration standards, construction vibration level increases would typically not result in exposure of persons to or generation of excessive groundborne vibration. By restricting the hours of construction to avoid vibrations during times when it could potentially be more of a nuisance and enforcing a vibration standard that prohibits ground vibrations that can be felt beyond the construction site lot line, the impact of new construction vibration would not result in a new impact or an increased severity of identified impacts that were not addressed in the General Plan EIR. In addition, individual development projects will be subject to site-specific environmental review per General Plan

3.8 NOISE

policy provisions, N 1.3 Program 1 and N 1.3 Program 2, which will necessitate identification of site-specific potential impacts as well as mitigation in the event that significant impacts are identified. Therefore, through the implementation of the aforementioned policies, implementation of the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR or a new impact. **Thus, there is no new or substantially more severe significant impact.**

Long-Term Operational Noise

Impact 3.8.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in less than significant impacts from noise impacts (General Plan EIR Impacts N-1, 2, and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of noise impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Various GHG reduction measures proposed under the project would include roadway modification projects, a number of which involve widening of existing facilities for the purpose of increasing their efficiency. For example, GHG reduction measures include implementation of vehicle miles traveled reduction strategies (R2T2), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4). Such measures would not in themselves introduce new traffic, but rather are intended to relieve current or projected future traffic congestion. However, in some cases, traffic efficiency measures would accommodate increased traffic speed and volumes.

Reduction measures R3E9 through R3E14 could result in renewable energy generating facilities. For all projects that use steam turbines, such as wind generating facilities and solar energy projects, typically the loudest noise encountered during construction is created by the steam blows. After erection and assembly of the feed water and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine. In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High pressure steam is then raised in a heat recovery steam generator (HRSG) or a boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation. These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet, which is an exceedingly disturbing level. In order to minimize disturbance from steam blows, the steam blow piping can be equipped with a silencer that will reduce noise levels by 20 to 30 dBA (CEC 2009, p. 4.6-7).

The General Plan noise policies promote the elimination of land use conflicts with respect to noise. Policies and programs include specific numeric noise level standards for new projects, including both transportation and non-transportation noise sources, as well as guidance in evaluating noise impacts and identifying noise mitigation measures. For example, General Plan Policy N 1.3 states that when land uses, including locally regulated noise sources, are proposed for areas containing noise-sensitive land uses, noise levels generated by the proposed use will not exceed the established performance standards in outdoor activity areas. Noise levels must not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for noise-sensitive land uses. Similarly, Policy N 1.6 enforces the hourly noise-level performance standards for stationary and other locally regulated sources, and Chapter 82.18 of the Development Code establishes noise hazard overlays to be applied to those areas where the day-night average (L_{dn}) is 65 decibels, 65 dBA or greater. When a land use application or development permit is proposed within a noise hazard overlay, a set of standards is applied to the project to ensure noise impacts do not negatively affect sensitive receptors.

Policy N 1.5 limits truck traffic in residential and commercial areas to designated truck routes and limits construction, deliveries, and through-truck traffic to designated routes. The County has promulgated and implemented noise policies and requirements for land development projects, which would include GHG reduction measures, by requiring these projects to provide specific noise analyses and implement any necessary measures to reduce noise to an acceptable level (N 1.3 Program 1 and N 1.3 Program 2).

These policy provisions are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document for Renewable Electricity Standard (CARB 2010f), which addresses impacts resulting from future renewable electricity standard projects (i.e., alternative energy generation projects). The Functional Equivalent Document for Renewable Electricity Standard identified the enforcement of ordinances regarding acceptable noise levels and the implementation of identified noise-reducing mitigation of acoustical analysis as acceptable noise mitigation.

Implementation of the General Plan policies and continued enforcement of County Development Code standards would ensure that future development meets applicable noise criteria for land use compatibility and/or includes noise attenuation features to meet applicable noise standards. This impact would not result in a new impact that was not addressed in the General Plan EIR or increase the severity of a significant impact that was addressed. Therefore, through the implementation of the aforementioned policies, implementation of the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR or a new impact. **Thus, there is no new or substantially more severe significant impact.**

3.9 PUBLIC SERVICES AND UTILITIES

3.9 PUBLIC SERVICES AND UTILITIES

This section describes public services and utilities for the unincorporated portions of San Bernardino County. Specifically, this section includes an examination of fire protection and services, water services (supply and infrastructure), wastewater services and stormwater drainage facilities. Each subsection includes a description of existing facilities and infrastructure, applicable service goals, potential environmental impacts resulting from implementation of the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). The existing setting and analysis utilizes the 2007 San Bernardino County General Plan and its associated Environmental Impact Report, as well as the County of San Bernardino Development Code.

3.9.1 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

3.9.1.1 EXISTING CONDITIONS

Fire protection services are collaboratively provided through various agencies in San Bernardino County, as briefly discussed below.

County of San Bernardino Fire Department. The Fire Department provides services through 68 fire stations located throughout the five divisions of the department (see **Table 3.9.1-1**): Mountain, North Desert, Victorville, South Desert, and Valley.

**TABLE 3.9.1-1
SAN BERNARDINO COUNTY FIRE DEPARTMENT DIVISIONS**

Mountain Division	
Square Mileage	616
Population Served	70,000
Fire Stations	8
Communities Served	Angelus Oaks, Barton Flats, Cedar Glen, Deer Lodge Park, Crest Park, Fawnskin, Forest Falls, Green Valley Lake, Lake Arrowhead, , Mountain Home village, Sky Forest,
North Desert Division	
Square Mileage	10,884
Population Served	150,000
Fire Stations	20
Communities Served	Baker, El Mirage, Harvard, Helendale, Hinkley, Lucerne Valley, Mt. View Acres, Oak Hills, Oro Grande, Phelan, Pinon Hills, Red Mountain, Searles Valley, , Summit Valley, Trona, Windy Acres, Wrightwood
Cities Served	Adelanto, Hesperia
Victorville	
Square Mileage	74
Population Served	117,000
Fire Stations	8
Communities Served	Baldy Mesa, Spring Valley Lake
Cities Served	Victorville

3.9 PUBLIC SERVICES AND UTILITIES

South Desert Division	
Square Mileage	7,968
Population Served	49,648
Fire Stations	17
Communities Served	Big River, Earp, Havasu Landing, Johnson Valley, Joshua Tree, Landers, Pioneer Town, Wonder Valley
Cities Served	Needles, Yucca Valley
Valley Division	
Square Mileage	585
Population Served	210,800
Fire Stations	15
Communities Served	Bloomington, Devore, Lytle Creek, Mentone, Mt. Baldy, Muscoy, San Antonio Heights
Cities Served	Fontana, Grand Terrace

Source: San Bernardino County 2010

Fire Districts and County Service Areas (CSAs). There are six County-governed fire protection districts and 23 CSAs with fire protection authority. These districts and CSAs help make up the overall county fire districts.

**TABLE 3.9.1-2
FIRE PROTECTION DISTRICTS**

Fire Protection Districts	
1	Central Valley fire Protection District
2	Forest Falls Fire Protection District
3	Lake Arrowhead Fire Protection District
4	Monte Vista Fire Protection District
5	San Bernardino County Consolidated Fire District 70
6	Yucca Valley Fire Protection District

Source: San Bernardino County 2006, Appendix D, p. 2-293

**TABLE 3.9.1-3
COUNTY SERVICE AREAS**

County Service Areas	
1	CSA 20 (Joshua Tree)
2	CSA 29 (Lucerne Valley)
3	CSA 30 (Red Mountain) (Contract with Kern County)
4	CSA 38 (Consolidated Fire Service)
5	CSA 38-D (Victorville)
6	CSA 38-H (Colton)
7	CSA 38-J (Big River)

County Service Areas	
8	CSA 38-K (Spring Valley Lake)
9	CSA 38-L (Highland – Paramedic)
10	CSA 38-M (Yucaipa – Paramedic)
11	CSA 38-N (El Mirage)
12	CSA 53 (Big Bear)
13	CSA 53-B (Fawnskin)
14	CSA 56 (Wrightwood)
15	CSA 56 F-1 (Pinon Hills)
16	CSA 70 (Countywide)
17	CSA 70 FP-1 (Windy Acres)
18	CSA 70 – HI (Havasu Lake)
19	CSA 70 – M (Wonder Valley)
20	CSA 70 – PM1 (Lake Arrowhead – Paramedics)
21	CSA 70 – W (Hinkley)
22	CSA 79 (Green Valley Lake)
23	CSA 82 (Searles Valley)

Source: San Bernardino County 2006, Appendix D, p. 2-293

3.9.1.2 REGULATORY FRAMEWORK

STATE

California Fire Code

The 2007 California Fire Code (Title 24, Part 9 of the California Code of Regulations) establishes regulations to safeguard against hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety and assistance to firefighters and emergency responders during emergency operations. The provisions of the Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout the State of California (CBSC 2007). The Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas.

California Health and Safety Code

Additional state fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which include regulations for building standards, fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, high-rise building and child-care facility standards, and fire suppression training.

3.9 PUBLIC SERVICES AND UTILITIES

California Occupational Safety and Health Administration

In accordance with the California Code of Regulations, Title 8, Sections 1270, Fire Prevention, and 6773, Fire Protection and Fire Fighting Equipment, the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

LOCAL

San Bernardino County General Plan

The General Plan Safety Element addresses the issue of fire hazard risks in the county, especially in the areas with wildland and urban development interface, such as in the foothill and mountain areas. The General Plan requires new development to prepare a site-specific fire protection plan, with special emphasis in areas of high and very high fire risk. The primary purpose of a fire protection plan is actually to prevent a fire from occurring. A fire protection plan should identify the fuel sources (hazardous or other materials) on site that could initiate or contribute to the spread of a fire as well as plan for the implementation of fire protection building systems, such as fixed fire extinguishing systems and alarm systems to control the ignition or spread of a fire. For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address fire protection and emergency medical services in the county. The policies are designed to guide future development in a way that lessens impacts to these features. These provisions are discussed in more detail within the impact discussion below.

San Bernardino Development Code

Division 3, Countywide Development Standards

Section 83.01.060 of the Development Code was developed to address the potential for wildland fire hazards to occur. The County has established a program to condition development in some of these areas through the adoption of a Fire Safety Overlay in the Development Code (County Code Chapter 82.13). The Fire Safety Overlay Map is accompanied by policies and standards for adequate services, facilities, mapping, and development regulations. Included in the development regulations are requirements for minimum road widths to provide adequate access, for both firefighting equipment and evacuating residents, and clearance around structures to prevent the rapid spread of fire from one structure to another.

3.9.1.3 IMPACTS AND MITIGATION MEASURES

STANDARD OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of fire protection and emergency medical service impacts of the General Plan (San Bernardino County 2006, p. IV-123).

- 1) Create substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities or services (or other public facilities, e.g.,

safety), the construction and/or provision of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection and emergency services.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant impacts or a substantial increase in severity of previously identified impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's two previously disclosed fire protection and emergency medical service impacts:

Impacts PS-2 and 3 – Development as a result of the General Plan Update could substantially increase the need for public services such as police and fire, and require additional medical facilities, libraries and schools. (San Bernardino County 2007c, p. 17)

As identified in the General Plan CEQA Findings, these impacts were identified as less than significant with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 18). The following adopted General Plan policies and programs address fire protection and emergency medical services and are designed to guide future development in a way that lessens impacts to these services. The County of San Bernardino elected to implement the mitigation monitoring requirements of the California Environmental Quality Act (CEQA) by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

Policy S 3.1 Continue the Fire Department's consolidation efforts to develop an integrated approach to coordinate the County's present and future needs in fire protection services in response to fire hazards and risks and to serve as a basis for program budgeting, identification, and implementation of optimum cost-effective solutions with the goal of providing necessary Service Levels and achieve Deployment Goals. These Service Levels and Deployment Goals are as follows:

The deployment of fire companies with appropriate levels of staffing and apparatus within the service area plays an important role in effective community fire protection and provision of a higher standard of care for life threatening health emergencies and thereby increasing the quality of life for our citizens. Consolidation provides the most effective option for streamlining the delivery of service and simplifying budget, fiscal, operational, and asset management and creates a single countywide Fire Protection District. It also provides the longest projection of financial solvency for the County Fire Department based on a special district deliver system. A tiered response, including staffing levels, response times and performance goals seems the only reasonable conclusion for the near future as the Department works towards establishing service planning goals for all areas of the County. Matching service levels with the various characteristics of a

3.9 PUBLIC SERVICES AND UTILITIES

geographic area will provide several things including: base line service, knowledge of when the area will move to the next level of service, reasonable stabilization of current service, allow for community identity and choice, allow for the projection of future service levels, and lay the basic foundation for strategic planning and future growth of the Department.

- S 3.1 Program 4 Develop, adopt and implement a recommended schedule of fees to finance the fire protection infrastructure that is tied to land use categories and specific community needs as prescribed by the countywide Fire Protection Master Plan.
- S 3.1 Program 5 Develop, adopt and implement a recommended schedule of fees for Fire Department's Fire Protection Planning Section within the Office of the Fire Marshall that is adequate to meet the staffing and operation needs of the program.
- S 3.1 Program 6 Continue to coordinate fire protection services countywide, with all city fire departments, self-governed special districts providing fire protection services, the California Department of Forestry and Fire Protection, the United States Forest Service, Bureau of Land Management.
- S 3.1 Program 7 Require applicants for new land developments to prepare a site specific fire protection plan, with special emphasis in areas of high and very high fire risk.
- S 3.1 Program 8 Require applicants to fund incremental improvements for the improvement of local fire protection services commensurate with the impacts of large developments (e.g., planned developments) in excess of 50 units.
- S 3.1 Program 10 The following Peak load Water Supply System guidelines (Figure II-5) shall be met for all new development or be adequately served by water supplies for domestic use and community fire protection in accordance with standards as determined by the County Fire Department.
 - a. Limit or prohibit development or activities in areas lacking water and fire fighting facilities.
 - b. Approve high intensity uses such as theaters, motels, restaurants and schools, and uses requiring the handling or storage of large amounts of highly flammable materials only in areas with year round fire protection and adequate water systems with hydrants.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new fire protection and emergency medical service impacts not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts PS-2 and 3.

The exact subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible impacts of implementation of the GHG Plan reduction measures.

IMPACTS AND MITIGATION MEASURES

Increased Demand for Fire Protection

Impact 3.9.1.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to fire protection and emergency medical services (General Plan EIR Impacts PS-2 and 3). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of fire protection service impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Construction of certain greenhouse gas (GHG) reduction measure roadway projects, such as the implementation of vehicle miles traveled reduction strategies (R2T2), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4), could temporarily interfere with fire and emergency response times, depending on the location, timing, and duration of construction activities due to temporary lane closures, installation of traffic control barriers, and rerouting of traffic through detours. However, these impacts would be addressed through standard project measures consisting of construction traffic controls and coordination with emergency service providers.

The General Plan includes several policies and programs to ensure that fire protection services will continue to maintain acceptable service levels. Implementation of the proposed Project will not accommodate additional growth beyond what has been anticipated by the General Plan, and all General Plan policies and programs apply to any future development. All individual projects will be subject to these mitigation policies. For instance, S 3.1 Program 7 requires new development to prepare a site-specific fire protection plan, with special emphasis in areas of high and very high fire risk. The primary purpose of a fire protection plan is actually to prevent a fire from occurring. A fire protection plan should identify the fuel sources (hazardous or other materials) on site that could initiate or contribute to the spread of a fire as well as plan for the implementation of fire protection building systems, such as fixed fire extinguishing systems and alarm systems to control the ignition or spread of a fire.

Based on the analysis above, the proposed Project would not increase the severity of fire protection service impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

3.9 PUBLIC SERVICES AND UTILITIES

3.9.2 WATER SUPPLY AND SERVICE

3.9.2.1 EXISTING CONDITIONS

Water Supply

The county's domestic water sources are supplied through both local and imported water. San Bernardino County's geographic challenges impact water sourcing and distribution. For the entire county, it is estimated that, on average, 85 percent of the domestic water is supplied by local sources while the balance is imported purchased water. There are supply percentage differences depending on geographic area (San Bernardino County 2006, p. IV-182).

Imported water is primarily purchased from the Metropolitan Water District of Southern California and the State Water Project (the California Aqueduct) as a supplemental source to local water supplies. While the Metropolitan Water District of Southern California distributes their water through local pipelines, there are also three State Water Project contractors and one subcontractor in the county (San Bernardino County 2006, p. IV-182):

- Crestline – Lake Arrowhead Water Agency
- Mojave Water Agency
- San Bernardino Valley Municipal Water District
- Inland Empire Utilities Agency, which is a member agency or subcontractor of Metropolitan Water District of Southern California

These four agencies are the largest of the water supplier/distribution agencies. There are approximately 400 other small source providers including County Service Areas and Districts, private mutual water companies, and single-use water sources.

According to the General Plan EIR, total water consumption by customers in the county increased approximately 15 percent from 1990 to 2000; during the same period, the county's resident population increased from 1,418,380 to 1,709,434, or 20.5 percent. For the same period, agriculture water use increased by approximately 28 percent and municipal and industrial use increased by 13 percent. The service area is primarily the urban portion of the county.

There are also three other types of water supplier/distributors in the county: the CSAs and Special Districts and the Southern California Water Company (SCWC). Eight SCWC systems in San Bernardino County focus on the Mountain and Desert regions (San Bernardino County 2006, p. IV-182).

Valley Region

The Valley Region is serviced by 35 water purveyors (suppliers and distributors) and approximately 20 small single sources. There are three primary water suppliers for this region: San Bernardino Valley Municipal Water District, Inland Empire Utilities Agency, and Metropolitan Water District (San Bernardino County 2006, p. IV-183).

Mountain Region

In the Mountain Region, there are approximately 20 water purveyors. This number does not include approximately 60 single-use water sources in this region, many of which are resident church and youth camps. The primary water wholesalers include Crestline – Lake Arrowhead Water District and the Big Bear Lake Department of Water and Power. Working in conjunction with these agencies are three large retail supplier/distributors including Crestline Village Water District, Lake Arrowhead Community Services District (CSD), and Running Springs Water District. Each of these agencies has documented a steady growth in water usage and is involved with programs for both water supply and conservation. Many small to moderate-sized water companies provide services for various mountain communities (San Bernardino County 2006, p. IV-183).

Desert Region

The Desert Region comprises 41 water purveyors and approximately 120 privately owned single sources. Most of the single sources in the rural portions of the Desert Region are for commercial businesses or private properties. The Mojave Water Agency is the primary water basin agency, but there are also water districts and CSDs that provide distribution services for water supplies.

3.9.2.2 REGULATORY FRAMEWORK

FEDERAL

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and groundwater wells. The SDWA applies to every public water system in the United States but does not regulate private wells that serve fewer than 25 individuals.

The SDWA authorizes the United States Environmental Protection Agency (USEPA) to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. Originally, the SDWA focused primarily on treatment as the means of providing safe drinking water at the tap. The 1996 amendments changed the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water. This approach is intended to ensure the quality of drinking water by protecting it from source to tap (USEPA 2009a).

STATE

California Water Plan Update 2009

The California Water Plan is the state's blueprint for integrated water management and sustainability. The California Department of Water Resources (DWR) updates the water plan approximately every five years. California Water Plan Update 2009 is the latest edition of the water plan and provides statewide strategic plan for water management to the year 2050. The California Water Plan provides framework and resource management strategies promoting two major initiatives: integrated regional water management that enables regions to implement

3.9 PUBLIC SERVICES AND UTILITIES

strategies appropriate for their own needs and helps them become more self-sufficient, and improved statewide water management systems that provide for upgrades to large physical facilities, such as the State Water Project, and statewide management programs essential to the California economy (DWR 2009a).

Senate Bill 610

Senate Bill (SB) 610 makes changes to the Urban Water Management Planning Act to require additional information in Urban Water Management Plans if groundwater is identified as a source available to the supplier. Required information includes a copy of any groundwater management plan adopted by the supplier, a copy of the adjudication order or decree for adjudicated basins, and if nonadjudicated, whether the basin has been identified as being overdrafted or projected to be overdrafted in the most current California Department of Water Resources publication on that basin. If the basin is in overdraft, the plan must include current efforts to eliminate any long-term overdraft. A key provision in SB 610 requires that any project subject to the California Environmental Quality Act (CEQA) supplied with water from a public water system be provided a specified water supply assessment, except as specified in the law (DWR 2009c).

Assembly Bill 901

Assembly Bill (AB) 901 requires Urban Water Management Plans to include information relating to the quality of existing sources of water available to an urban water supplier over given time periods and the manner in which water quality affects water management strategies and supply (DWR 2009c).

California Urban Water Conservation Council

The California Urban Water Conservation Council (CUWCC) was created in 1991 by numerous urban water agencies, public interest organizations, and private entities throughout California to assist in increasing water conservation in the state. The goal of the CUWCC is to integrate best management practices (BMPs) into the planning and management of California's water resources. A Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California (2007) was signed by these agencies and formalizes an agreement to implement the BMPs and makes a cooperative effort to reduce the consumption of California's water resources (CUWCC 2009). By signing the council's MOU, members agree to implement 14 BMPs to conserve water in urban areas. The council's BMPs were updated in 2008 to include current technology and to credit agencies for innovative water conservation programs. The 14 BMPs are now organized into five categories. Two categories, Utility Operations and Education, are foundational BMPs, because they are considered essential water conservation activities by any utility and are adopted for implementation by all signatories to the MOU as ongoing practices with no time limits. The remaining BMPs are programmatic BMPs and are organized into residential, commercial, industrial, and institutional (CII), and landscape categories. The BMPs are shown in **Table 3.9.2-1**.

**TABLE 3.9.2-1
CUWCC REVISED BMPs**

Old BMP Number and Name	New BMP Category
1. Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers	Programmatic: Residential
2. Residential Plumbing Retrofit	Programmatic: Residential
3. System Water Audits, Leak Detection and Repair	Foundational: Utility Operations – Water Loss Control
4. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	Foundational: Utility Operations – Metering
5. Large Landscape Conservation Programs and Incentives	Programmatic: Landscape
6. High-Efficiency Clothes Washing Machine Financial Incentive Programs	Programmatic: Residential
7. Public Information Programs	Foundational: Education – Public Information Programs
8. School Education Programs	Foundational: Education – School Education Programs
9. Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts	Programmatic: Commercial, Industrial, and Institutional
10. Wholesale Agency Assistance Programs	Foundational: Utility Operations – Operations
11. Retail Conservation Pricing	Foundational: Utility Operations – Pricing
12. Conservation Coordinator	Foundational: Utility Operations – Operations
13. Water Waste Prohibition	Foundational: Utility Operations – Operations
14. Residential ULFT Replacement Programs	Programmatic: Residential

Source: CUWCC 2009

Assembly Bill 1420

Effective January 1, 2009, AB 1420 amended the Urban Water Management Planning Act to require that water management grants or loans made to urban water suppliers and awarded or administered by DWR, the State Water Resources Control Board, or the California Bay-Delta Authority or its successor agency be conditioned on implementation of the water demand management measures. The measures correspond to CUWCC's 14 best management practices shown in **Table 3.9.20-1** above.

LOCAL

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to protect water supply. For instance, the General Plan requires continued monitoring of the county's adjudicated groundwater basins to ensure a balanced hydrological system in terms of withdrawal and replenishment of water from groundwater basins. In addition, prior to approval of new development, the General Plan requires that adequate and reliable water supplies and conveyance systems be available to support the development. For a complete list of the

3.9 PUBLIC SERVICES AND UTILITIES

applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address water supply issues in the county. These policies are designed to guide future development in a way that lessens impacts to this resource. These provisions are discussed in more detail in the impact discussion below.

San Bernardino Development Code

Division 3, Countywide Development Standards

Chapter 83.10 of the Development Code regulates landscape development in the county and requires that at least 75 percent of the plants selected in non-turf areas be well suited to the climate of the region and require minimal water once established in the landscape. Plants that require similar water needs are mandated to be grouped together and irrigated separately. Native plant materials or locally adaptable drought-tolerant plantings capable of surviving the prevailing climatic and soil conditions with a minimum of supplemental water are emphasized under Chapter 83.10, and in order to reduce evaporation and competition for water a minimum of three inches of mulch must be added to the soil surface in non-turf areas after planting and within 18 inches of tree trunks.

3.9.2.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of impacts to water supply issues of the General Plan (San Bernardino County 2006, p. IV-187).

- 1) Result in the need for new entitlements or a substantial expansion or alteration to local or regional water supplies that would result in a physical impact to the environment.

Water quality impacts are discussed in Section 3.7, Hydrology and Water Quality.

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant supply impacts or a substantial increase in severity of previously identified water supply related impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's three previously disclosed water supply impacts:

Impacts UT-1, 2, and 3 – Development anticipated in the updated General Plan could increase the need for additional water, increased sewer capacity, an increase in the amount of waste requiring disposal at landfills and additional natural gas providers, electricity services providers and telecommunications infrastructure. (San Bernardino County 2007c, p. 22)

As identified in the General Plan CEQA Findings, these impacts were identified as less than significant with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 24). The following adopted General Plan policies and programs address water supply and are designed to guide future development in a way that lessens impacts to water supply resources. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

- | | |
|--------------------|---|
| Policy CI 11.7 | Assist in the development of additional conveyance facilities and use of groundwater basins to store surplus surface or imported water. |
| Policy CI 11.8 | Encourage local distribution systems to interconnect with regional and local systems, where feasible, to assist in maximizing use of local ground and surface water during droughts and emergencies. |
| Policy CI 11.9 | Encourage water conservation, replenishment programs, and water sources in areas experiencing difficulty in obtaining timely or economical water service from existing potential suppliers, or water quality or quantity problems. |
| Policy CI 11.10 | Because the recharge of groundwater basins is vital to the supply of water in the County, and because these areas can function only when retained in open space, the County will consider retaining existing groundwater recharge and storm flow retention areas as open space lands. |
| CI 11.11 Program 2 | <p>Upon request by the local responsible authority, and pursuant to state law, assist in the development and implementation of regional water resource management plans incorporating individual district plans that will:</p> <ul style="list-style-type: none">a. Identify needs for recharge of over-drafted groundwater basins and proceed with plans for development and management;b. Prioritize critical areas of basins in overdraft, sole source basins, or quality degradation problems;c. Maintain or enhance natural water recharge characteristics;d. Create recharge areas for over-drafted basins offsetting increased consumption attributable to new development;e. Cooperate with state water contract agencies in the purchase and distribution of State Water Project water; andf. Share information on supply and demand for water and projected service levels and capacities that can be utilized in assessments by water districts and agencies. |

3.9 PUBLIC SERVICES AND UTILITIES

Policy CI 11.12	Prior to approval of new development, ensure that adequate and reliable water supplies and conveyance systems will be available to support the development, consistent with coordination between land use planning and water system planning.
CI 11.12 Program 6	Develop a systematic, ongoing assessment of regional and local water supply needs and capabilities to serve planned land uses as defined in the General Plan.
CI 11.12 Program 7	Monitor future development to ensure that sufficient local water supply or alternative imported water supplies can be provided.
Policy CO 5.2	The County Water Masters will continue to monitor the County's adjudicated groundwater basins to ensure a balanced hydrological system in terms of withdrawal and replenishment of water from groundwater basins.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new water supply related impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts UT-1, 2, and 3.

The exact subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible impacts of implementation of the GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents).

IMPACTS AND MITIGATION MEASURES

Water Supply Demand, Infrastructure, and Environmental Effects

Impact 3.9.2.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact to water supply (General Plan EIR Impacts UT-1, 2, and 3). Implementation of the proposed General Plan Amendment, Greenhouse Gas Reduction Plan, and associated Development Code Amendment would incrementally increase demand for water supply as well as the potential for needed additional water supply infrastructure, both of which could result in significant effects on the physical environment. Implementation of General Plan policy provisions and the continued enforcement of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. This project would not result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

As discussed in Section 3.7, Hydrology and Water Quality, implementation of certain reduction measures proposed under the GHG Plan would result in both short- and long-term impacts to the county's water supply. For example, during grading activities, water would be used to suppress fugitive dust generated by construction equipment. Many GHG reduction measures could potentially involve modification of existing facilities. As such, a substantial increase in landscaped areas is not anticipated for these projects. GHG reduction measures of the proposed Project, particularly roadway improvements including signal synchronization and traffic flow management (R2T4) and new high-occupancy vehicle lanes (R2T8), are not likely to affect groundwater supplies by incrementally reducing groundwater recharge potential, because they would be implemented in areas where development already occurs.

Reduction measures R3E9 through R3E14 could result in renewable energy generating facilities that may require water for solar power plant cooling (or cleaning of solar panels) or wind turbine operational needs. Water supply needs for wind and solar projects generally tend to be minor and are often less than the agricultural use of the land (San Bernardino County 2010a, p. 55) (BLM/County 2010, p. 3-237). In addition, these renewable energy generating facilities do not involve substantial land coverage that would alter the infiltration capability of the land (San Bernardino County 2010a, pp. 40-41)(BLM/County 2010, p. 3-181).

Based on review of the California Energy Commission's California Wind Resource Potential Map as well as the Draft Staff Report California Solar Resources (see page 18), large portions of the county have potential for renewable energy generating facilities. Although these facilities could result in substantial groundwater demand, Article X, Section 2 of the California Constitution declares, "the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented..." In order to better define what "unreasonable use" means in terms of power plant cooling, SWRCB issued Resolution 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (Resolution 75-58). It sets forth, in priority order, a list of preferable water sources for power plant cooling as follows: (1) wastewater being discharged to the ocean, (2) ocean, (3) brackish water from natural sources or irrigation return flow, (4) inland wastewaters of low TDS, and (5) other inland waters. The resolution also states that fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. Therefore, it is unlikely that the development of large renewable energy generating projects (subject to CEC licensing) located in San Bernardino County would extract potable groundwater for cooling purposes. Additionally, the California Energy Commission's 2003 Integrated Energy Policy Report states that "the Energy Commission would approve the use of fresh water for cooling purposes by power plants which it licenses only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound.' "

Chapter 83.10 of the Development Code regulates landscape development in the county and requires that at least 75 percent of the plants selected in non-turf areas be well suited to the climate of the region and require minimal water once established in the landscape. Plants that require similar water needs are mandated to be grouped together and irrigated separately. Native plant materials or locally adaptable drought-tolerant plantings capable of surviving the prevailing climatic and soil conditions with a minimum of supplemental water are emphasized under Chapter 83.10, and in order to reduce evaporation and competition for water a minimum of 3 inches of mulch must be added to the soil surface in non-turf areas after planting and within 18 inches of tree trunks. The requirements of Chapter 83.10 will ensure that GHG reduction measures implemented under the proposed Project ensure that low-water-use landscaping is installed.

3.9 PUBLIC SERVICES AND UTILITIES

General Plan Policy CO 5.2 requires continued monitoring of the county's adjudicated groundwater basins to ensure a balanced hydrological system in terms of withdrawal and replenishment of water from groundwater basins. Policy CI 11.12 states that prior to approval of new development, the County will ensure that adequate and reliable water supplies and conveyance systems will be available to support the development. Project-level CEQA review of future water supply infrastructure would identify and mitigate significant environmental impacts.

Based on the analysis above, the proposed Project would not increase the severity of water supply impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

3.9.3 WASTEWATER SERVICE AND STORMWATER DRAINAGE FACILITIES

3.9.3.1 EXISTING CONDITIONS

WASTEWATER SERVICE

Valley Region

The Valley Region is the location for most of the public wastewater collection/treatment facilities. These facilities are all within the jurisdiction of the Santa Ana Regional Water Board and include Inland Empire Utilities Agency (various locations), Rialto, Colton, San Bernardino, Redlands, Yucaipa Valley Water District facilities, and Lytle Creek (San Bernardino County 2006, p. IV-183).

Mountain Region

In the Mountain Region, regional treatment facilities include Crestline Sanitation District, Running Springs County Water District, Lake Arrowhead County Service Area (CSA), Lytle Creek CSA, and Big Bear Area Regional Wastewater Agency. The agencies that provide the infrastructure to these treatment facilities include Big Bear Regional Wastewater Agency, Crestline Sanitation District, Lake Arrowhead CSD, Lytle Creek CSA, and CSA 79 (Green Valley Lake) (San Bernardino County 2006, p. IV-184).

Desert Region

Most residential properties in the Desert Region are on private sewage treatment systems (septic tanks). However, there are limited service sewerage agencies in the region including Victor Valley Regional Wastewater Agency, the City of Adelanto, and the City of Barstow (San Bernardino County 2006, p. IV-184).

Drainage

Several drainage plans have been prepared for the different cities in the county. Master Drainage Plans are used as guidelines for future flood control facility improvements, for future planning and coordinating with the San Bernardino County Flood Control District, local cities, and future development activities, and as a basis for developing funding mechanisms.

3.9.3.2 REGULATORY FRAMEWORK

FEDERAL

Clean Water Act

The Clean Water Act (CWA) is the primary federal legislation governing surface water quality protection. The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water. Pollutants regulated under the CWA include "priority" pollutants, including various toxic pollutants; "conventional" pollutants, such as biochemical oxygen demand (BOD), total suspended solids (TSS), fecal coliform, oil and grease, and pH; and "non-conventional" pollutants, including any pollutant not identified as either conventional or priority. The CWA regulates both direct and indirect discharges (USEPA 2009a).

General Pretreatment Regulations

Another type of discharge that is regulated by the CWA is discharge that goes to a publicly owned treatment works (POTW). POTWs collect wastewater from homes, commercial buildings, and industrial facilities and transport it via a collection system to the treatment plant. Here, the POTW removes harmful organisms and other contaminants from the sewage so it can be discharged safely into the receiving stream. Generally, POTWs are designed to treat domestic sewage only. However, POTWs also receive wastewater from industrial (nondomestic) users. The General Pretreatment Regulations establish responsibilities of federal, state, and local government, industry, and the public to implement pretreatment standards to protect municipal wastewater treatment plants from damage that may occur when hazardous, toxic, or other wastes are discharged into a sewer system and to protect the quality of sludge generated by these plants. Discharges to a POTW are regulated primarily by the POTW itself, rather than the state/tribe or USEPA (USEPA 2009a).

STATE

Porter-Cologne Water Quality Act

In 1969, the California Legislature enacted the Porter-Cologne Water Quality Control Act to preserve, enhance, and restore the quality of the state's water resources. The act established the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards as the principal state agencies with the responsibility for controlling water quality in California. Under the act, water quality policy is established, water quality standards are enforced for both surface water and groundwater, and the discharges of pollutants from point and nonpoint sources are regulated. The act authorizes the SWRCB to establish water quality principles and guidelines for long-range resource planning including groundwater and surface water management programs and control and use of recycled water (SWRCB 2009).

State Water Resources Control Board

Created by the California legislature in 1967, the five-member State Water Resources Control Board allocates water rights, adjudicates water right disputes, develops statewide water

3.9 PUBLIC SERVICES AND UTILITIES

protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards located in the major watersheds of the state. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters (SWRCB 2009).

SWRCB is responsible for implementing the CWA and issues National Pollutant Discharge Elimination System permits to cities and counties through Regional Water Quality Control Boards (RWQCBs). San Bernardino County is located in a portion of the state that is regulated by the RWQCB South Coast Region, South Lahontan Region, and Colorado River Region.

Waste Discharge Requirements Program

In general, the Waste Discharge Requirements (WDRs) program (sometimes referred to as the Non Chapter 15 (Non 15) Program) regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the program also includes the discharge of wastes classified as inert, pursuant to Section 20230 of Title 27. Several SWRCB programs are administered under the program, including the Sanitary Sewer Order and recycled water programs (SWRCB 2009).

Sanitary Sewer Overflow Program

A sanitary sewer overflow (SSO) is any overflow, spill, release, discharge, or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oil, and grease and can pollute surface and ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters. To provide a consistent, statewide regulatory approach to address SSOs, the State Water Resources Control Board adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003 (Sanitary Sewer Order) on May 2, 2006. The Sanitary Sewer Order requires public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans and report all SSOs to the State Water Resources Control Board's online SSO database. All public agencies that own or operate a sanitary sewer system that comprises more than 1 mile of pipes or sewer lines which convey wastewater to a publicly owned treatment facility must apply for coverage under the Sanitary Sewer Order (SWRCB 2009).

Recycled Water Policy

To establish uniform requirements for the use of recycled water, SWRCB adopted a statewide Recycled Water Policy on February 3, 2009. The policy's purpose is to increase the use of recycled water from municipal wastewater sources that meets the definition in Water Code Section 13050(n), in a manner that implements state and federal water quality laws. The policy describes permitting criteria that are intended to streamline the permitting of the vast majority of recycled water projects. The intent of this streamlined permit process is to expedite the implementation of recycled water projects in a manner that implements state and federal water quality laws while allowing the Regional Water Boards to focus on projects that require substantial regulatory review due to unique site-specific conditions (SWRCB 2009).

LOCAL

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to address wastewater and drainage facilities. For instance, the General Plan requires the County to work with local responsible wastewater authorities and verify that suitable arrangements have been made to safely dispose of sewage, septage, or sludge for all new development (subdivisions and conditional use permits). In addition, the General Plan states that prior to approval of new development, the County will ensure that adequate and reliable wastewater systems will be available to support the development. The General Plan requires new development to use site-design, source-control, and treatment control best management practices (BMPs) on applicable projects, to achieve compliance with the County Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) Permit. The NPDES Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Please refer to Section 3.7 for an expanded discussion on the NPDES.

For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address wastewater and drainage facilities in the county. These policies are designed to guide future development in a way that lessens impacts to these facilities. These provisions are discussed in more detail in the impact discussions below.

San Bernardino Development Code

Division 9, Public Facilities Financing

Chapter 89.01 of the Development Code requires the payment of drainage fees for most new construction that is within an adopted Local Area Drainage Plan. The fees are paid prior to the issuance of building permits for the purposes of defraying the actual or estimated costs of constructing planned drainage facilities.

3.9.3.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of impacts to wastewater service and stormwater drainage facilities in the General Plan (San Bernardino County 2006, p. IV-187).

- 1) Require or result in the construction of wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- 2) Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- 3) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

3.9 PUBLIC SERVICES AND UTILITIES

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant impacts or a substantial increase in severity of previously identified impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's three previously disclosed impacts:

Impacts UT-4, 5, and 6 – Development anticipated in the updated General Plan could increase the need for additional water, increased sewer capacity, an increase in the amount of waste requiring disposal at landfills and additional natural gas providers, electricity services providers and telecommunications infrastructure. (San Bernardino County 2007c, p. 22)

As identified in the General Plan CEQA Findings, these impacts were identified as less than significant with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 24). The following adopted General Plan policies and programs address wastewater and are designed to guide future development in a way that lessens impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in the General Plan EIR directly into the General Plan as policies.

Policy CI 12.3	Continue to work with local responsible wastewater authorities and verify that suitable arrangements have been made to safely dispose of sewage, septage, or sludge for all new development (subdivisions and conditional use permits).
Policy CI 12.11	Prior to approval of new development, ensure that adequate and reliable wastewater systems will be available to support the development, consistent with coordination between land use planning and wastewater system planning.
CI 12.11 Program 2	Cooperate with the local wastewater/sewering authority to consider the effect of development proposals and whether they should include the phased construction of wastewater treatment facilities.
CI 12.11 Program 3	Work with wastewater agencies to ensure planned capacity increases in locations where sewage facilities are approaching capacity.
Policy CI 12.12	Cooperate with local wastewater/sewering authorities to monitor future development to ensure that development will proceed only when sufficient capacity or approved alternative wastewater treatment systems can be provided.

- Policy CI 13.1 Utilize site-design, source-control, and treatment control best management practices (BMPs) on applicable projects, to achieve compliance with the County Municipal Stormwater NPDES Permit.
- Policy CI 13.2 Promote the implementation of low impact design principles to help control the quantity and improve the quality of urban runoff. These principles include:
- a. Minimize changes in hydrology and pollutant loading; ensure that post development runoff rates and velocities from a site do not adversely impact downstream erosion, and stream habitat; minimize the quantity of stormwater directed to impermeable surfaces; and maximize percolation of stormwater into the ground where appropriate.
 - b. Limit disturbance of natural water bodies and drainage systems; conserve natural areas; protect slopes and channels;
 - c. Preserve wetlands, riparian corridors, and buffer zones; establish reasonable limits on the clearing of vegetation from the project site;
 - d. Establish development guidelines for areas particularly susceptible to erosion and sediment loss;
 - e. Require incorporation of structural and non-structural BMPs to mitigate projected increases in pollutant loads and flows.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts UT-4, 5, and 6.

The exact subsequent activities or projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. The analysis relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents). In addition, the analysis also considers recently prepared environmental review documents for renewable energy projects in the county to identify potential impacts unique to implementation of the GHG Plan reduction measures.

IMPACTS AND MITIGATION MEASURES

Wastewater Conveyance and Treatment

Impact 3.9.3.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding wastewater conveyance and treatment (General Plan EIR Impacts UT-4, 5, and 6). Subsequent development under the proposed Project could incrementally increase wastewater flows and require additional

3.9 PUBLIC SERVICES AND UTILITIES

infrastructure and treatment capacity to accommodate anticipated demands. However, implementation of General Plan policy provisions and the continued enforcement of the County Development Code would generally ensure that implementation of the proposed Project would not result in an increased severity of these impacts. This project would not result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

The proposed Project involves implementation of several reduction measures that reduce GHG emissions in the County. Examples of proposed GHG reduction measures include, but are not limited to, residential renewable energy incentives (R2E3), a warehouse renewable incentive program (R2E4), the installation of solar photovoltaic systems on two County buildings (R2E8-INT), public transit strategies (R3T1), the expansion of the vanpool program (R2EC1-INT), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and increased use of combined heat and power systems (R1E6). GHG reduction measure projects are not anticipated to significantly affect wastewater facilities or create a significant impact on wastewater services as most of them involve modification of existing structures and facilities that already have wastewater service. However, should a future GHG reduction measure involve the construction of new restrooms, bicycle kiosks, and facilities for recreation trails, there may be additional demand for wastewater services.

Policy CI 12.3 requires the County to work with local responsible wastewater authorities and verify that suitable arrangements have been made to safely dispose of sewage, septage, or sludge for all new development (subdivisions and conditional use permits). In addition, Policy CI 12.11 states that prior to approval of new development, the County will ensure that adequate and reliable wastewater systems will be available to support the development, and CI 12.11 Program 2 mandates the consideration of the effects of development proposals on wastewater treatment facilities. Additionally, Chapter 89.01 of the Development Code requires the payment of drainage fees for most new construction that is within an adopted Local Area Drainage Plan.

Based on the analysis above, the proposed Project would not increase the severity of wastewater service impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Stormwater Drainage

Impact 3.9.3.2 The General Plan EIR and General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding stormwater drainage (General Plan EIR Impact HWQ-2). Subsequent development under the proposed Project could increase stormwater flows and require additional infrastructure to accommodate anticipated demands. However, continued implementation of General Plan policy provisions would ensure that no adverse impacts resulting from stormwater drainage issues would occur. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Examples of proposed GHG reduction measures include, but are not limited to, residential renewable energy incentives (R2E3), a warehouse solar incentive program (R2E4), the installation of solar photovoltaic systems on two County buildings (R2E8-INT), public transit expansion measures (R3T1), the expansion of the vanpool program (R2EC1-INT), the construction of vehicle lanes for high occupancy vehicles (R2T8), and increased use of combined heat and power systems (R1E6). GHG reduction measures implemented under the proposed Project would not be anticipated to significantly affect stormwater facilities. However, planned GHG reduction measure improvements will result in construction of impervious surfaces, which may alter existing drainage patterns and increase stormwater runoff. Expanded infrastructure would then be needed in order to accommodate resultant stormwater runoff increases.

The General Plan contains policy provisions designed to minimize impacts associated with the need for drainage infrastructure. Policy CI 13.1 requires new development to utilize site-design, source-control, and treatment control best management practices (BMPs) on applicable projects, to achieve compliance with the County Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) Permit. The stipulations of Policy CI 13.1 require site-specific, case-by-case analysis for all needed stormwater drainage infrastructure, which will result in the most efficient infrastructure placement. Policy CI 13.2 promotes the implementation of low impact design principles to help control urban runoff. Examples of these principles include the minimization of changes in hydrology and pollutant loading in order to ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion and also to minimize the quantity of stormwater directed to impermeable surfaces. Additionally, Chapter 89.01 of the Development Code requires the payment of drainage fees for most new construction that is within an adopted Local Area Drainage Plan.

Based on the analysis above, the proposed Project would not increase the severity of drainage impacts or result in a new impact that was not addressed in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

3.10 TRANSPORTATION AND CIRCULATION

3.10 TRANSPORTATION AND CIRCULATION

This section describes the existing transportation systems in San Bernardino County, characterizes different modes of transportation, and analyzes potential transportation-related impacts associated with the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). The existing setting and analysis in this section utilizes the 2007 San Bernardino County General Plan (General Plan) and its associated Environmental Impact Report, as well as recently prepared environmental review documents for renewable energy projects in the county and the County of San Bernardino Development Code.

3.10.1 EXISTING SETTING

San Bernardino County extends from the eastern edge of the Los Angeles metropolitan region to the Arizona border. Because of its location, the County acts as the gateway between southern California and the continental United States. The vast majority of travel trips in the County are made by automobile, using the existing network of freeways and arterial highways. Transit (i.e., bus and commuter rail) service is also an increasingly important mode of transportation in the more urbanized parts of the County. A small fraction of the trips are made utilizing other modes of transportation such as air, intercity rail, bicycling and walking.

San Bernardino County has major freeway and railroad corridors that provide access to cargo and products between the Ports of Los Angeles and Long Beach and the rest of the country. Currently, these ports are two of the busiest ports in the world, and, as a result, a large portion of the goods traveling into and out of the United States pass from these ports through the County either by truck or rail (San Bernardino County 2006, p. IV-141). Cargo operations are aided by two large-scale railroad classification yards and a state-of-the-art intermodal transfer facility located within the County.

Other rail infrastructure includes portions of three commuter rail lines, connecting the County to Los Angeles and Orange Counties, and two transcontinental routes operated by Amtrak. The County has also been identified as one of the prime locations for the development of magnetic levitation high-speed rail, Maglev, in the near future (San Bernardino County 2006, p. IV-141). The aviation industry also has a strong presence in San Bernardino County, with a total of 44 public and private airports and 25 heliports. Included in these are Ontario International Airport, one of the fastest growing commercial airports in the United States; Southern California Logistics Airport (SCLA) and San Bernardino International Airport (SBDIA), new intermodal gateways for air freight beginning to develop; and Cable Airport, the largest privately-owned airport in the United States. (San Bernardino County 2006, p. IV-141.)

ROADWAY SYSTEM

There are currently over 10,000 miles of roadways located within San Bernardino County (San Bernardino County 2006, p. IV-141). These facilities fall under the jurisdiction of one of three levels of governmental agencies responsible for construction and maintenance of roadway infrastructure. Caltrans is responsible for maintaining approximately 1,240 miles of roadway throughout the County (San Bernardino County 2006, p. IV-141). This total includes six federal (Interstate) freeways, two federal (U.S.) highways and eighteen state highways, also known as state routes. The San Bernardino County Department of Public Works is responsible for maintaining approximately 2,830 miles of both paved and unpaved roadways primarily located in unincorporated areas of the County (San Bernardino County 2006, p. IV-141). These facilities range in classification from major arterial highways to local streets. The remaining 5,930 miles of roadways within San Bernardino County fall under the jurisdiction of the numerous incorporated

3.10 TRANSPORTATION AND CIRCULATION

municipalities located across the County. These facilities also range in classification from major arterials to local streets. (Refer to the Circulation Background Report of the adopted County General Plan (San Bernardino County, 2007b) to see the extensive roadway network that currently exists within the County as well as the roadway network that is currently under County jurisdiction.)

PUBLIC TRANSPORTATION

There are seven public transit agencies that operate within San Bernardino County. These provide approximately 17.5 million passengers per year with access to a vast majority of the Valley and Mountain Regions of the County and to the more developed areas of the Desert Region (San Bernardino County 2006, p. IV-161). Of the seven transit operators, six are located almost entirely within the County and are provided funds and received oversight from San Bernardino Associated Governments (SANBAG), the County's transportation planning agency. SANBAG does not provide funding or have oversight over Foothill Transit Agency (San Bernardino County 2006, p. IV-161).

San Bernardino County also maintains a service directory for organizations and agencies that provide specialized transportation for seniors and persons with disabilities. This directory, created and maintained by the Public and Specialized Transportation Advisory and Coordination Council, currently lists approximately 200 public transit operators and social service transportation providers that have been registered by the County to provide access to seniors, disabled persons and persons of limited means (San Bernardino County 2006, p. IV-161).

Greyhound offers regional and nationwide bus service to San Bernardino County residents through seven stations located in these communities – Baker, Barstow, Fontana, Needles, a limited station in Redlands, San Bernardino and Victorville. From these stations, Greyhound offers connections to locations such as Los Angeles, Las Vegas, Phoenix, Tucson and points beyond (San Bernardino County 2006, p. IV-161).

RAILROADS

Commuter Service

Commuter rail service in San Bernardino County is currently provided by Metrolink. Metrolink is the regional commuter rail system operated by the Southern California Regional Rail Authority (SCRRA), a joint powers authority created by the transportation commissions of the counties of Los Angeles, Orange, Riverside and San Bernardino, as mandated by the California Legislature through Senate Bill 1402, Chapter Four of Division 12 of the Public Utilities Code. Metrolink operates seven lines throughout the Los Angeles Metropolitan Area, three of which provide direct service to San Bernardino County; the San Bernardino Line, the Riverside Line and the Inland Empire Orange County Line (San Bernardino County 2006, p. IV-162).

Amtrak

Amtrak has two routes that travel through San Bernardino County. The Southwest Chief operates daily between Los Angeles and Chicago and stops in four cities in San Bernardino County - San Bernardino, Victorville, Barstow and Needles. The Sunset Limited operates three times per week between Los Angeles and Orlando, Florida, and makes one stop in San Bernardino County, in the City of Ontario (San Bernardino County 2006, p. IV-162).

Aviation

Currently, there are 44 public and private airports operating throughout the County (San Bernardino County 2006, p. IV-162). The County manages, operates and maintains six of these facilities. San Bernardino County also has a total of 25 heliports; 4 are publicly operated, 11 for private medical use and 10 for private general use (San Bernardino County 2006, p. IV-162).

Ontario International Airport (ONT) is operated by Los Angeles World Airports, a branch of the City of Los Angeles. It is currently equipped to accommodate international flights. ONT is one of the fastest growing commercial airports in Southern California and is one of the top 100 busiest airports in the United States for both commercial and cargo services (San Bernardino County 2006, p. IV-162).

San Bernardino International Airport (SBD) is operated by the San Bernardino International Airport Authority (SBIAA), a joint powers authority comprised of the County of San Bernardino and the Cities of San Bernardino, Colton, Loma Linda and Highland. San Bernardino International has been converted to a commercial airport from its previous use as Norton Air Force Base and is seeking to establish itself as an alternative destination for both passenger and cargo carriers.

The former George Air Force Base, located in Victorville, is one of the five federally-owned airports in the County and is also being converted to civilian use and has been renamed as the

SCLA (San Bernardino County 2006, p. IV-163). This facility is currently operating as a staging area for military personnel stationed at National Training Center in Fort Irwin. The final proposed use of this facility is to act as an intermodal gateway to southern California through which a large portion of the freight being carried along the I-15 corridor can be distributed. The remaining four facilities are being maintained and operated by the respective government agencies by which they are owned (San Bernardino County 2006, p. IV-163).

Four municipal airports are located within San Bernardino County and are widely utilized for recreational and educational purposes with the number of annual operations at these facilities ranging from 12,500 to 125,000 (San Bernardino County 2006, p. IV-163).

The remaining 27 airports are privately owned and can be found throughout the County. Cable Airport is considered to be the largest privately-owned airport in the United States and conducts 88,000 operations per year. The Hesperia and the Roy Williams (formerly Hi- Desert) Airports are also greatly utilized. (San Bernardino County 2006, p. IV-163.)

GOODS MOVEMENT

Due to the County's location at the eastern edge of the Los Angeles Metropolitan Area, the transportation and distribution of goods is a very important industry in San Bernardino County. Millions of tons of freight are distributed to destinations across the United States utilizing County roadways, rail lines and airports. Below are descriptions of each mode of transportation as it relates to goods movement.

Trucking

There are around 4,000 trucking entities operating in San Bernardino County (San Bernardino County 2006, p. IV-163). These entities engage in both local delivery routes and another long-distance deliveries. A local trip generally occurs in the same metropolitan area and only requires

3.10 TRANSPORTATION AND CIRCULATION

a single day to complete. Long-distance trips are those trips that occur between metropolitan areas and require greater periods of time to complete.

Rail Freight

Class I Railroads: There are two Class I freight railroads that operate lines in San Bernardino County: the BNSF Railway (owned by the Burlington Northern Santa Fe Corporation) and the Union Pacific (UP) Railroad.

Class II Railroads: There are currently no Class II railroads in San Bernardino County.

Class III Railroads: Two Class III railroads are currently operating in San Bernardino County. Traffic along the Trona Railway, operating near the Town of Trona in the northwestern portion of the County, only consists of railcars loaded with borax destined for overseas markets. This railroad's activity level is near 5 million gross ton-miles and occurs over 31 total miles of track. The Arizona & California Railroad operates along a branch line from the main BNSF Railway line and carries cargo to the Phoenix metropolitan area. This railroad operates 134 miles of track and carries approximately 5 million gross ton-miles of cargo per year (San Bernardino County 2006, p. IV-164).

Air Freight

Ontario International Airport (ONT) is currently served by nine major U.S. airfreight carriers. These carriers processed 575,369 tons of cargo through the facility in 2005 (San Bernardino County 2006, p. IV-166). The freight movement system surrounding ONT also includes two Class I railroads, four major freeways and an expanding network of freight forwarders (San Bernardino County 2006, p. IV-166).

The airfreight carriers operating from ONT include Airborne Express, Ameriflight, DHL, Empire Airways, Express Net, Federal Express, West Air, Union Flights and United Parcel Service (UPS). UPS is the largest airfreight carrier operating at ONT, consisting of approximately 70 percent of the airport's cargo, and began four weekly flights to China using Boeing 747 cargo aircraft, creating a direct link to the Pacific Rim's largest and fastest growing market (San Bernardino County 2006, p. IV-166).

TRANSPORTATION DEMAND MEASURES

Park and Ride Facilities

Within San Bernardino County, there are 11 Park & Ride facilities located across the southwestern portion of the County. Currently, there are five facilities located in the Valley Region, four in the Desert Region and two in the Mountain Region (San Bernardino County 2006, p. IV-166). Each Park & Ride lot is free of charge and open for public use 24 hours a day, seven days a week.

High Occupancy Vehicle Carpool Lanes

San Bernardino County has approximately 43 miles of carpool lanes along four separate freeways (i.e., I-10, SR-60, SR-210 and SR-71) (San Bernardino County 2006, p. IV-166). All of the existing facilities are located in the western portion of the Valley Region. Construction of an additional 18 miles is scheduled to occur in the next several years and will be located in the eastern portion (San Bernardino County 2006, p. IV-166).

Ridesharing

SANBAG operates two programs for individuals and one for employers through which commuters can receive financial incentives by participating in a rideshare program. Option Rideshare is a program that offers commuters financial incentives of up to \$2.00 per day when they use a rideshare mode for three consecutive months (San Bernardino County 2006, p. IV-167). Team Ride is an extension of the initial program that provides discounts and special offers to participants at restaurants and events in both San Bernardino and Riverside Counties. The final program is the Inland Empire Commuter Services Program. This program is designed to help employers develop and maintain a rideshare program through continuing education and assistance from SANBAG free of charge.

Non-Motorized Facilities

San Bernardino County has a Non-Motorized Transportation Plan that deals primarily with bicycle and pedestrian use by residents for recreational and commuting purposes. This plan was most updated in 2001 and is an attempt to develop a more comprehensive approach toward future planning and construction activities in regards to bicycle and pedestrian infrastructure.

Intelligent Transportation Systems Applications

Intelligent Transportation Systems constitute a wide spectrum of techniques and applications that are currently being applied to existing roadways, highways and transit systems to increase their efficiency, safety and ability to relieve congestion. San Bernardino County is currently employing several types of Intelligent Transportation Systems applications.

- 1-800-COMMUTE telephone line, which provides travel information for highways, transit, rideshare and other commuting alternatives;
- Closed-circuit television cameras to help in identifying and responding to accidents more quickly;
- Electronic sensors placed in freeways that transmit vehicle counts to a traffic management center and can be used for real-time traffic conditions;
- Traffic signal control systems that are synchronized through computer software specifically designed to better monitor and respond to local traffic congestion;
- Changeable message signs that alert drivers to possible delays due to accident or congestion and allow for route diversion;
- Traffic signals, or ramp meters, placed at freeway entrance ramps to provide a more consistent flow of entering traffic onto the freeway, resulting in less congestion and potential accidents due to crowded conditions; and
- Smart call boxes that gather traffic count data and transmit this information to traffic management centers and the CHP.

MEASURE I/NEXUS STUDY

Measure I is the half-cent sales tax collected throughout San Bernardino County for transportation improvements. San Bernardino County voters approved the measure in

3.10 TRANSPORTATION AND CIRCULATION

November 1989 to ensure that needed transportation projects were implemented countywide. The San Bernardino Association of Governments (SANBAG) administers Measure I revenue and is responsible for determining which projects receive Measure I funding, and ensuring that transportation projects are implemented. In 2004, Measure I was extended by a vote of the people from 2010 to 2040. It is expected to generate an additional \$6 billion in revenue for transportation improvements.

3.10.2 REGULATORY FRAMEWORK

FEDERAL

The Safe, Accountable, Flexible, Efficient Transportation Equity Act, or SAFETEA, was approved by Congress in July 2005 then signed into law by President Bush in August 2005. This law provides \$244 billion in guaranteed funding for federal surface transportation programs until December 2010, an average annual increase of 35 percent from previous years. This law replaces the Transportation Equity Act for the 21st Century (TEA-21), which expired in September 2003.

STATE

State guidelines generally set the framework for regional and local planning efforts. State law requires the regional and local planning agencies to develop and submit a Regional Transportation Plan (RTP) every three years to the California Transportation Commission (CTC) and the California Department of Transportation (Caltrans).

LOCAL

San Bernardino Associated Governments (SANBAG)

The need for the County to maintain a comprehensive and functional circulation system over such an enormous geographical area required a coordinated effort from all of the local municipalities located within San Bernardino County. This was one of the main objectives in the creation of the San Bernardino Associated Governments (SANBAG). SANBAG is the council of governments and acts as the transportation planning agency for San Bernardino County. There are currently 25 member jurisdictions that, through appointed representatives, are responsible for the cooperative regional planning of local and regional roadway improvements, train and bus transportation, deployment of intelligent transportation systems and long-term planning studies (San Bernardino 2007b, p. III-4).

As designated by statute, SANBAG serves in the capacity of County Transportation Committee, which is responsible for allocating and programming state and federal funds for regional transportation projects throughout the County. SANBAG also serves as the County Transportation Authority and is responsible for administering Measure I, the half-cent transportation sales tax originally approved by voters in 1989 and extended for an additional 30 years in November 2004. SANBAG also has been designated to serve as the Service Authority for Freeway Emergencies and as the Congestion Management Agency responsible for establishing, maintaining, and enforcing San Bernardino County's Congestion Management Program.

A large portion of the funding allotted to SANBAG to conduct the activities is generated through the Measure I half-cent transportation tax (San Bernardino 2007b, p. III-4). A smaller portion of the necessary revenue is obtained through federal grant activity.

San Bernardino County Congestion Management Plan

The Congestion Management Program (CMP) in San Bernardino County was created in June 1990 as a provision of Proposition 111. Under this proposition, urbanized areas with populations of more than 50,000 would be required to undertake a congestion management program that was adopted by a designated Congestion Management Agency (CMA). SANBAG was designated as the CMA by the County Board of Supervisors. The CMP's level of service (LOS) standard requires all CMP segments to operate at LOS E or better (LOS A being the most efficient level of service, LOS F being the least efficient) with the exception of several facilities identified in the adopted County General Plan (San Bernardino County 2006b, p. III-5).

The procedures in the 2000 Highway Capacity Manual (HCM) were adopted as the LOS procedures to be utilized in analyzing CMP facilities. Through the use of traffic impact analysis (TIA) reports and Comprehensive Transportation Plan (CTP) model forecasts, the CMP evaluates proposed land use decisions to ensure adequate transportation network improvements are developed to accommodate future growth in population. If a CMP facility is found to fall below the level of service standard, either under existing or future conditions, a deficiency plan must be prepared, adopted, and implemented by local jurisdictions that contribute to such situations (San Bernardino County 2006b, p. III-6). Annual monitoring activities provide a method of accountability for those local jurisdictions required to mitigate a network facility with substandard LOS.

Southern California Association of Governments

SANBAG actively participates in the regional planning activities of the Southern California Association of Governments (SCAG). SCAG's planning area covers the counties of San Bernardino, Imperial, Los Angeles, Orange, Riverside, and Ventura. Members of the SANBAG Board of Directors serve on various SCAG committees and on the Regional Council, the governing board of SCAG. Two of the principal activities of SCAG are the development of the Regional Transportation Plan (every three years), and the Regional Transportation Improvement Program (every two years). SANBAG coordinates the input of local jurisdictions within San Bernardino County for inclusion of projects in the Regional Transportation Plan (RTP), and the Regional Transportation Improvement Program (RTIP).

Each of the six counties in the SCAG Region has a transportation commission or authority, with the exception of Imperial County, where the Imperial Valley Association of Governments (IVAG) serves as the countywide transportation agency. These agencies are charged with implementing countywide transportation planning activities, allocating locally generated transportation revenues and, in some cases, operating transit services.

Additionally, there are 14 subregions within the SCAG Region. These subregional councils of governments (COGs) are groups of neighboring cities and communities (sometimes an entire county) that work together to identify, prioritize and seek transportation funding for needed investments in their respective areas.

The RTP is a 20-year transportation blueprint which outlines a long-range strategy to meet mobility, financial, and air quality requirements. This plan must show how the region will meet federal air quality standards and other needs based on realistic estimates of transportation funding. Programs and projects outlined in the final document are eligible for state and federal funding. On May 8, 2008, SCAG adopted the 2008 Regional Transportation Plan (RTP): Making the Connections. The RTP is the culmination of a multi-year effort involving stakeholders from

3.10 TRANSPORTATION AND CIRCULATION

across the SCAG Region. The 2008 RTP emphasizes the importance of tracking the Plan's performance through specific indicators.

The RTIP is prepared to implement projects and programs listed in the RTP. This document is developed in compliance with state and federal requirements. County Transportation Commissions have the responsibility under state law of proposing county projects, using the current RTP's policies, programs and projects as a guide, from among submittals by cities and local agencies. The locally prioritized lists of projects are forwarded to SCAG for review. From this list, SCAG develops the RTIP based on consistency with the current RTP, inter-county connectivity, financial constraint and conformity satisfaction.

San Bernardino County General Plan

The General Plan includes policies and programs that are intended to reduce impacts to transportation. For instance, the General Plan requires the review and monitoring of development proposals that have an impact on the County unincorporated transportation system and ensures that applicants, subdividers and developers dedicate and improve right-of-way per County standards and contribute to their fair share of off-site transportation-related mitigation. Similarly, the General Plan requires that development reviews and approvals for proposals affecting state and/or federal roadways to reflect input from Caltrans and other local and regional transportation agencies to ensure transportation system improvements are implemented in locations where facilities are approaching or exceed capacity. For a complete list of the applicable policies, please refer to the Methodology subsection below that provides all of the General Plan policies and programs which address traffic and transportation in the county. These policies are designed to guide future development in a way that lessens impacts to these features. These provisions are discussed in more detail in the impact discussions below.

San Bernardino Development Code

Division 3, Countywide Development Standards

Chapter 83.05 (Dedications and Installations of Street and Trail Improvement) of the Development Code regulates and controls dedications and the installation of street improvements. The regulations are intended to ensure the provision of adequate traffic circulation. In addition, Chapter 83.12 provides standards for the various types of roads within the County maintained road system.

The purpose of Chapter 83.14 (Transportation Control Measures) is to reduce vehicle trips thereby reducing traffic congestion, improving air quality and promoting an improved quality of life. This Chapter is intended to satisfy the legal requirements of the San Bernardino County Congestion Management Program (CMP). Chapter 83.14 applies to all non-residential projects within the unincorporated portions of San Bernardino County that are greater than 10,000 square feet in area. For such development proposals, the requirement of vehicle trip reducing standards like mass transit improvements (i.e., bus pullouts, bus pads, and bus shelters), which shall be provided for all new residential and non-residential development along existing or planned transit routes, as well as the requirement for all new non-residential and multi-family (of ten or more units) development to incorporate on-site pedestrian walkways and bicycle facilities connecting each structure of the proposed development to public streets, are mandated by Chapter 83.14. Chapter 83.14 also requires that bicycle parking facilities or secured bicycle lockers be provided for all non-residential and multi-family (of ten or more units) developments when discretionary review is required. In addition, a minimum of one shower facility accessible to

both men and women shall be provided for persons bicycling or walking to work for all new non-residential development generating 250 or more peak hour trips.

3.10.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The following significance criteria were utilized in the General Plan EIR for the evaluation of transportation impacts of the General Plan (San Bernardino County 2006, p. IV-169).

- 1) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).
- 2) Exceed, either individually or cumulatively, a level of service standard established by the County congestion management agency for designated roads or highways.
- 3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- 4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- 5) Result in inadequate emergency access
- 6) Result in inadequate parking capacity
- 7) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

The analysis provided in this section utilizes these significance criteria as well as the impact analysis provided in the General Plan EIR and the impact conclusions set forth in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) (March 13, 2007). As described further below, the determination of significance of the impacts is based on whether the proposed Project would result in new significant transportation-related impacts or a substantial increase in severity of previously identified transportation impacts by the General Plan EIR.

METHODOLOGY

The basis of the impact analysis for the proposed Project is the General Plan EIR's eight previously disclosed transportation impacts:

Impacts TR-1, 4, 5, 6, 7, and 8 – The General Plan may result in an unacceptable level of service on roadways, generate additional demand for air travel and air freight services to and from San Bernardino County and result in inadequate parking capacity. Implementation of the General Plan will not result in inadequate emergency access. All development under the Plan will be subject to review by the County Department of Public Works and by emergency services agencies to ensure that adequate emergency access is provided. (San Bernardino County 2007c, p. 20)

3.10 TRANSPORTATION AND CIRCULATION

As identified in the General Plan CEQA Findings, mitigation measures have been incorporated to reduce potential impacts to traffic and transportation from Impacts TR-1, 4, 5, 6, 7, and 8 to less than significant (San Bernardino County 2007c, p. 21).

Impacts TR-2 and 3 – Implementation of the General Plan Update will result in increased traffic and reduced levels of service on roads and at intersections within the County. (San Bernardino County 2007c, p. 20)

As identified in the General Plan CEQA Findings, these impacts were identified as significant and unavoidable even with the adoption of identified mitigation measures (San Bernardino County 2007c, p. 21).

The following adopted General Plan policies and programs address traffic and transportation and are designed to guide future development in a way that lessens impacts. The County of San Bernardino elected to implement the mitigation monitoring requirements of CEQA by incorporating all mitigation measures presented in General Plan EIR directly into the General Plan as policies.

- | | |
|------------------|---|
| Policy CI 1.1 | The County's comprehensive transportation system will be developed according to the Circulation Policy Map (the Circulation Element Map), which outlines the ultimate multi-modal (non-motorized, highway, and transit) system to accommodate the County's mobility needs and provides the County's objectives to be achieved through coordination and cooperation between the County and the local municipalities in the County, adjacent counties and cities within those counties, Caltrans, and SANBAG. |
| Policy CI 2.1 | Work with adjacent jurisdictions to minimize inconsistencies in existing and ultimate right-of-way and roadway capacity across jurisdictional boundaries. |
| Policy CI 2.4 | Work with the California Department of Transportation (Caltrans) and the San Bernardino Associated Governments (SANBAG) on appropriate fair-share mitigation for impacts of development on state highways. |
| Policy CI 2.7 | Coordinate with Caltrans, SANBAG, the Southern California Association of Governments (SCAG) and other agencies regarding transportation system improvements in the County's Measure I and other adopted Capital Improvement Programs. |
| Policy CI 3.1 | Encourage the reduction of automobile usage through various incentive programs. |
| CI 3.1 Program 1 | Promote and institute incentive programs for the use of alternative transportation modes, such as County sponsored vanpools, flexible working hours and alternate (e.g. 4-day) workweeks. |
| CI 3.1 Program 2 | Provide a pattern of land use designations, along with appropriate development standards that facilitates development of local retail uses near residential uses, consistent with Smart Growth and New Urbanism Concepts in new development to reduce the number of |

3.10 TRANSPORTATION AND CIRCULATION

- automobile trips by providing neighborhood shopping facilities and connectivity through pedestrian and bicycle paths.
- CI 3.1 Program 3 Promote and encourage the design and implementation of land uses, development standards, and capital improvement programs that maximize the use of public transit facilities and programs, and the availability of local retail uses accessible to local residents by walking or biking to reduce dependence on the automobile.
- CI 3.1 Program 4 Work with regional agencies (SCAG, Caltrans, SANBAG) to develop ridesharing programs, facilities, and various modes of public transit (local and rapid bus, Metrolink, and high-speed trains).
- CI 3.1 Program 5 Designate existing Park-and-Ride facilities on the General Plan Circulation Maps, work with Caltrans to identify appropriate future Park-and-Ride facilities, and develop a program to acquire and develop sites for such facilities in areas where there is an identified need.
- Policy CI 3.2 Assist Omnitrans, Metrolink, and other transit agencies in coordinating the location and scheduling of public transit routes, services, and facilities for better coordination with bus and rail transit systems.
- Policy CI 3.3 Extend public transit between residential areas and industrial/urban employment centers.
- Policy CI 3.4 Continue and expand transportation services and public transit between Ontario Airport, Orange County Airport and Los Angeles International Airport and consider promotion of future high-speed train and magnetic levitation (Mag-Lev) systems for better long-range airport connectivity.
- Policy CI 4.2 To reduce the dependence on the automobile for local trips, integrate transportation and land use planning at the community and regional levels by promoting transit-oriented development (TOD), where appropriate and feasible.
- CI 4.2 Program 1 Encourage mixed-use and transit oriented design, where applicable. The integration of mixed-use and transit design may reduce the use of the automobile, but the extent of the benefits and remaining impacts may nonetheless require independent traffic impact analysis and environmental impact assessment.
- Policy CI 4.3 Development reviews and approvals for proposals affecting state and/or federal roadways shall reflect input from Caltrans and other local and regional transportation agencies to ensure transportation system improvements are implemented in locations where facilities are approaching or exceed capacity.
- CI 4.3 Program 1 Monitor, on a continuing basis, and compile annual reports on the capacity and level of service of the County-maintained road system.

3.10 TRANSPORTATION AND CIRCULATION

- CI 4.3 Program 2 Continue monitoring and reporting of capacity and levels of service on the countywide Congestion Management Program (CMP) network.
- CI 4.3 Program 3 Continue the review and monitoring of development proposals in local jurisdictions that have an impact on the County unincorporated transportation system.
- Policy CI 4.6 Ensure that applicants, subdividers and developers dedicate and improve right-of-way per County standards and contribute to their fair share of off-site mitigation.
- Policy CI 6.1 Require safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips. Install bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available.
- Policy CI 6.2 Utilize right-of-way and easement dedication and acquisition as tools to implement a County trail system.
- CI 8.1 Program 1 The County will prepare a long-range general aviation plan for County airports and, in cooperation with the airports' jurisdictions and affected cities, develop land use plans for areas surrounding all airports to, (a) Permit development only in accordance with approved airport land use plans and (b) Review new developments in terms of conflicts between the proposed use and the airport needs.
- Policy V/CI 1.1 The County shall ensure that all new development proposals do not degrade Levels of Service (LOS) on Major Arterials below LOS C during non-peak hours or below LOS D during peak-hours in the Valley Region.
- Policy M/CI 1.1 The County shall ensure that all new development proposals do not degrade Levels of Service (LOS) on State Routes and Major Arterials below LOS C during non-peak hours or below LOS D during peak-hours in the Mountain Region.
- Policy D/CI 1.1 The County shall ensure that all new development proposals do not degrade Levels of Service (LOS) on Major Arterials below LOS C in the Desert Region.

The impact analysis below utilizes these General Plan policies and development standard provisions of the Development Code to determine whether implementation of the proposed Project (i.e., GHG Plan reduction measures under the County's jurisdiction to implement) would result in a new impact to transportation not previously addressed in the General Plan EIR or increased severity of previously identified General Plan EIR Impacts TR-1 through 8.

Specific subsequent projects, their associated locations, and physical effects on the environment from the implementation of the GHG Plan reduction measures under the County's jurisdiction are not known at this time. Thus, this analysis uses a programmatic approach to evaluating possible impacts related to traffic and transportation from implementation of the

GHG Plan reduction measures. The analysis also relies on environmental documents prepared by the California Air Resources Board for implementation of state programs for GHG emission reduction (functional equivalent documents – see Section 3.0 for a description of these documents).

IMPACTS AND MITIGATION MEASURES

Traffic on County Transportation Facilities

Impact 3.10.1 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding standards for facility operations within the County (General Plan EIR Impact TR-1). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of transportation-related impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

Implementation of the proposed Project would involve implementation of several GHG reduction measures in order to aggressively reduce GHG emissions in the county. Examples of proposed GHG reduction measures include, but are not limited to, residential energy efficiency retrofits (R2E1), commercial energy efficiency retrofits (R2E2), the installation of solar photovoltaic systems on two County buildings (R2E8-INT), and increased use of combined heat and power systems (R2E3-INT). Other examples of GHG reduction measures include measures R2E3 and R2E4, R2E6 through R2E10, and R3E9 through R3E14 which involve installation of solar photovoltaic panels and related facilities, wind generators, and other renewable energy facilities. During construction, temporary minor traffic increases would occur as a result of construction equipment vehicles and employee vehicle trips to and from the area. These impacts, however, would be temporary in nature and would end upon project construction.

Other GHG reduction measures proposed under the project would include roadway modification projects, a number of which involve widening of existing facilities for the purpose of increasing their efficiency. For example, GHG reduction measures include implementation of vehicle miles traveled reduction strategies (R2T2), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4). Such measures would not in themselves introduce new traffic, but rather are intended to relieve current or projected future traffic congestion. However, in some cases, traffic efficiency measures would accommodate increased traffic volumes.

Lastly, GHG reduction measures such as R3T4, Regional Land Use and Transportation Coordination, are intended to reduce greenhouse gas emissions by reducing passenger vehicle travel. R3T4 could require consideration of alternative land use and transportation patterns through pre-existing state and federal planning processes. In other words, in attempting to more efficiently coordinate regional land use and transportation in order to achieve a reduction of vehicle miles traveled and thus GHG emissions, traffic congestion could actually increase due to

3.10 TRANSPORTATION AND CIRCULATION

increased development density (i.e., residents living in highly dense New York City average 9 vehicle miles travelled per day which is 16 miles less than the average U.S. resident (CFCs, 2010)).

The General Plan includes several policies and programs to ensure that transportation facilities will continue to maintain acceptable service levels. Implementation of the proposed Project will not accommodate additional growth beyond what has been anticipated by the General Plan, and all General Plan policies and programs apply to any future development. All individual projects will be subject to these mitigation policies. For instance, CI 4.2 Program 1 encourages transit oriented development design where applicable. While this program recognizes that the integration of transit design into new development may reduce the use of the automobile, the extent of the benefits and remaining impacts may nonetheless require independent traffic impact analysis and environmental impact assessment. Similarly, Policy CI 4.6 ensures that applicants, subdividers and developers dedicate and improve transport facilities per County standards and contribute to their fair share of off-site mitigation.

County policies V/CI 1.1; D/CI 1.1; and M/CI 1.1 attempt to achieve Level of Service "D" on all County roadways in the Valley and Mountain Regions and LOS "C" on all County roadways in the Desert region through the mandated review of new development proposals for traffic impacts, and the requirement that new development be mitigated to maintain these Level of Service standards on the County's circulation system. These policy provisions are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document for Renewable Electricity Standard (CARB 2010f), which addresses impacts resulting from future renewable electricity standard projects (i.e., alternative energy generation projects). The Functional Equivalent Document for Renewable Electricity Standard identified project-level review and the implementation of identified mitigation of said project-level review.

In addition to General Plan policy provisions, Chapter 83.14 of the Development Code is intended to reduce vehicle trips and satisfy the legal requirements of the San Bernardino County Congestion Management Program (CMP). Chapter 83.14 applies to all non-residential projects within the unincorporated portions of San Bernardino County that are greater than 10,000 square feet in area. For such development proposals, it is mandated that vehicle trip reducing standards such as mass transit improvements (i.e., bus pullouts, bus pads, and bus shelters) and on-site pedestrian walkways and bicycle facilities connecting to public streets be incorporated when constructed. Chapter 83.14 also requires that bicycle parking facilities or secured bicycle lockers be provided for all non-residential developments when discretionary review is required. In addition, a minimum of one shower facility accessible to both men and women shall be provided for persons bicycling or walking to work for all new non-residential development generating 250 or more peak hour trips.

Subsequent GHG reduction measures implemented as a result of the proposed Project would still be required to be considered pursuant to CEQA on a case-by-case basis following submittal of a specific development proposal. As specific reduction measure projects are proposed, the significance of potential impacts would need to be addressed on a case-by-case basis through site-specific traffic impact studies as the individual projects are developed. In the Valley and Mountain Regions, the County shall approve development proposals only when they are consistent with the County's objective of achieving Level of Service "D" or better on County roadways segments and intersections affected by the development. Future development proposals under the proposed Project will strive to achieve the minimum LOS "D" objective through incorporating design measures and roadway improvements in the proposed development and/or mitigation fees to the County to offset capital improvements to achieve the LOS "D" objective (Policies M/CI 1.1 and V/CI 1.1). In the Desert Region, the County shall approve development proposals only when they are consistent with the County's objective of

achieving Level of Service “C” or better on County roadway segments and intersections affected by the development. Development proposals will strive to achieve the minimum LOS “C” objective through incorporating design measures and roadway improvements in the proposed development and/or mitigation fees to the County to offset capital improvements to achieve the LOS “C” objective (Policy D/CI 1.1). Therefore, through the implementation of the aforementioned policies, implementation of the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Traffic on Transportation Facilities Outside County Jurisdiction

Impact 3.10.2 The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, impacts to facility operations not under the County’s jurisdiction, such as freeways and State highways, as well as arterials in incorporated cities within the county and in areas to the County, resulting from implementation of the 2007 General Plan cannot be fully mitigated to a level below significance (General Plan EIR Impacts TR-2 and 3). Implementation of General Plan policy provisions would generally ensure that implementation of the proposed Project would not result in increased severity of these impacts. The proposed Project would not result in a new impact that was not addressed in the General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. There is no new or substantially more severe significant impact.**

As stated under Impact 3.10.1, implementation of the proposed Project would involve temporary minor traffic increases occurring as a result of construction equipment vehicles and employee vehicle trips to and from the area. These impacts, however, would be temporary in nature and would end upon project construction. Other GHG reduction measures proposed under the project would include roadway modification projects, a number of which involve widening of existing facilities for the purpose of increasing their efficiency. Lastly, GHG reduction measure R3T4, which is intended to reduce greenhouse gas emissions by reducing passenger vehicle travel, could achieve a reduction of vehicle miles traveled and thus GHG emissions, yet in doing so could actually increase traffic congestion due to increased development density.

While County policies V/CI 1.1; D/CI 1.1; and M/CI 1.1 would require future development proposals under the proposed Project to achieve minimum LOS objectives through incorporating design measures and roadway improvements and/or mitigation fees to the County to offset capital improvements to achieve the LOS objective, implementation of these standards and future improvements is uncertain for facilities not under the County’s jurisdiction, such as freeways and State highways, as well as arterials in incorporated cities within the county and in areas adjacent, which do not fall under the jurisdiction (or control) of the County. Thus, the application of County standards and future improvements cannot be guaranteed.

Implementation of the proposed Project would not contribute to additional growth beyond what has been anticipated by the General Plan, and all General Plan policies and programs apply to any future development. The General Plan includes several policies and programs to ensure that transportation facilities affected by County actions, yet not under the jurisdiction of the County, will continue to maintain acceptable service levels. Policy CI 2.1 states that the County will work with adjacent jurisdictions to minimize inconsistencies in existing and ultimate right-of-way and roadway capacity across jurisdictional boundaries. Similarly, Policy CI 2.4 ensures County

3.10 TRANSPORTATION AND CIRCULATION

cooperation with the Caltrans and SANBAG on appropriate fair-share mitigation for impacts of development on state highways. In addition, Policy CI 4.3 requires development reviews and approvals for proposals affecting state and/or federal roadways to reflect input from Caltrans and other local and regional transportation agencies to ensure transportation system improvements are implemented in locations where facilities are approaching or exceed capacity. All individual projects will be subject to these mitigation policies.

Thus, while the application of County standards and future improvements cannot be guaranteed, the policy provisions mentioned above ensure County coordination with Caltrans, SANBAG, and adjacent jurisdictions with transportation facilities affected by future GHG reduction measures. This active coordination seeks to maintain acceptable service levels on transportation facilities affected by County actions, yet not under the jurisdiction of the County. **Thus, there is no new or substantially more severe significant impact.**

Air Traffic Patterns

Impact 3.10.3 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding a change in air traffic patterns including either an increase in traffic levels or a change in location that results in substantial safety risks (General Plan EIR Impacts TR- 4). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of air traffic-related impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

In general, the GHG reduction measures envisioned as part of the proposed Project involve expansion of existing facilities in urbanized or already developed areas, and/or within existing rights-of-way and their implementation is not anticipated to result in a change in air traffic patterns including either an increase in traffic levels or a change in location that results in substantial safety risks. However, reduction measures R2E3 and R2E4, R2E6 through R2E10, and R3E9 through R3E14 could involve installation of solar photovoltaic panels and related facilities, wind generators, and other renewable energy facilities that have the potential to result in a change in air traffic patterns due to interference from tall structures and/or glare concerns.

General Plan provision CI 8.1 Program 1 requires the County to develop, in cooperation with the airports' jurisdictions and affected cities, and use plans for areas surrounding all airports to, (a) permit development only in accordance with approved airport land use plans and (b) review new developments in terms of conflicts between the proposed use and the airport needs. More specifically, Chapters 84.26 and 84.29 of the Development Code regulates the height and siting of wind generators as well as wind generator spacing, and special standards to address land use compatibility. In addition, mitigation measure MM 3.1.2 of this SEIR (refer to Section 3.1) would amend the County Development Code to include the standard that solar energy facilities shall be designed to preclude daytime glare on any right-of-way, which would include air traffic patterns.

Implementation of mitigation measure MM 3.1.2 and continued compliance with the General Plan and Development Code would ensure that the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

Roadway or Traffic Hazards

Impact 3.10.4 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding hazards resulting due to a design feature or incompatible uses (General Plan EIR Impacts TR- 5). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would not increase the severity of roadway or traffic hazard impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

The GHG reduction measures of the project would not result in any new development potential or construction of facilities that would propose land use changes that are expected to alter roadway designs that would increase hazards. Conversely, GHG reduction measures such as the construction of vehicle lanes for high-occupancy vehicles (R2T8) and roadway improvements including signal synchronization and traffic flow management provisions (R2T4) promote traffic efficiency. All future GHG reduction measures related to roadway improvements implemented under the proposed Project would still be subject to County roadway design standards. These standards regulate features such as right-of-way widths, the number of lanes necessary, curb to curb separation distances, and facility-type classification and require roadway designs consistent with Caltrans' Highway Design Manual. The Highway Design Manual establishes uniform policies and procedures to carry out the highway design functions of Caltrans.

Reduction measures, such as but not limited to, R2T7, R3T1, R3T2, R3T4, R3T10, R2W1 through R2W7, R3W1, R3W2, R3W4, and R3W5 could involve the construction of new facilities and improvements. Subsequent GHG reduction measures implemented as a result of the proposed Project would still be required to be considered pursuant to CEQA on a case-by-case basis following submittal of a specific development proposal. As specific reduction measures are proposed, the significance of potential impacts would need to be addressed on a case-by-case basis through site-specific traffic impact studies as the individual projects are developed. According to the County General Plan EIR, all proposals affecting roadways will be reviewed by the County Department of Public Works to ensure that there are no unsafe design features (San Bernardino County 2006, p. IV-177).

These policy provisions are consistent with recognized measures highlighted in the California Air Resources Board's Functional Equivalent Document for Renewable Electricity Standard (CARB 2010f), which addresses impacts resulting from future renewable electricity standard projects (i.e., alternative energy generation projects). The Functional Equivalent Document for Renewable Electricity Standard identified project-level review and the implementation of identified the provision of safe ingress and egress to/from proposed Project sites and the identification of road design requirements for any proposed roads, and related road

3.10 TRANSPORTATION AND CIRCULATION

improvements, in coordination with applicable federal, state, and local transportation agencies such as Caltrans. **Thus, there is no new or substantially more severe significant impact.**

Emergency Access

Impact 3.10.5 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding emergency access (General Plan EIR Impacts TR- 6). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of emergency access-related impacts or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.**

The proposed Project would not result in any new development potential or construction of facilities that would negatively affect emergency access beyond what the General Plan EIR considered. As mentioned above, GHG reduction measures such as roadway improvements including signal synchronization and traffic flow management provisions (R2T4) promote traffic efficiency and thus response times of emergency responders. All future GHG reduction measures related to roadway improvements implemented under the proposed Project would still be subject to County roadway design standards. These standards regulate features such as right-of-way widths, the number of lanes necessary, curb to curb separation distances, and facility-type classification and require roadway designs consistent with Caltrans' Highway Design Manual. The Highway Design Manual establishes uniform policies and procedures addressing emergency access.

Subsequent GHG reduction measures implemented as a result of the proposed Project would still be required to be considered pursuant to CEQA on a case-by-case basis following submittal of a specific development proposal. As specific reduction measure projects are proposed, the significance of potential impacts would need to be addressed on a case-by-case basis through site-specific traffic impact studies as the individual projects are developed. According to the County General Plan EIR, all future development is be subject to review by the County Department of Public Works and by the applicable emergency service agencies to ensure that adequate emergency access is provided (San Bernardino County 2006, p. IV-177). **Thus, there is no new or substantially more severe significant impact.**

Public Transit, Bicycle, and Pedestrian Facilities

Impact 3.10.6 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in a less than significant impact regarding public transit, bicycle, and pedestrian facilities (General Plan EIR Impacts TR- 8). Implementation of General Plan policy provisions and the continued implementation of the County Development Code would ensure that implementation of the proposed Project would not increase the severity of impacts to public transit systems, or bicycle and pedestrian facilities or result in a new impact that was not addressed in General Plan EIR. **Thus, the proposed Project would not result in a substantial increase in the severity of this impact, which was previously identified in the General Plan EIR as an**

impact that was reduced to a less than significant level. There is no new or substantially more severe significant impact.

The proposed Project would not result in any new development potential or construction of facilities that would propose land use changes beyond what the General Plan EIR considered that would conflict with transit, bicycle or pedestrian facilities. The purpose of the GHG Plan is to reduce GHG emissions within the county. Implementation of GHG Plan reduction measures will promote transit, pedestrian and bicycle uses, which is a beneficial impact. For example, GHG reduction measure R2T8 proposes the construction of vehicle lanes for high-occupancy vehicles and reduction measure R2T4 proposes roadway improvements including signal synchronization and traffic flow management provisions. Additionally, R2T7 promotes bicycle and pedestrian infrastructure.

Furthermore, the General Plan supports alternative transportation as demonstrated by existing policy provisions. CI 3.1 Program 1 institutes incentive programs for the use of alternative transportation modes and CI 3.1 Program 2 requires the provision of a pattern of land use designations that provides connectivity through pedestrian and bicycle paths. In addition, Policy CI 3.2 states that the County shall assist Omnitrans, Metrolink, and other transit agencies in coordinating the location and scheduling of public transit routes, services, and facilities for better coordination with bus and rail transit systems and Policy CI 3.3 mandates the extension public transit between residential areas and industrial/urban employment centers. Policy CI 6.1 requires safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial and institutional developments as well as the installation of bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available.

Since implementation of GHG Plan reduction measures will actually promote transit, pedestrian and bicycle uses and such proposals are reinforced with alternative transportation-related General Plan policies, the proposed Project would not cause a substantial increase in the severity of a significant impact identified in the General Plan EIR. **Thus, there is no new or substantially more severe significant impact.**

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

This section provides a discussion on the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project) and its ability to address greenhouse gas emissions under the jurisdiction of the County.

3.11.1 ENVIRONMENTAL SETTING

EXISTING CLIMATE SETTING

To fully understand global climate change it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases (GHGs) that contribute to this phenomenon. Various gases in the Earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF₃), and sulfur hexafluoride (SF₆).

For most non-industrial development projects, motor vehicles make up the bulk of GHG emissions produced on an operational basis. The primary greenhouse gases emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (CARB, 2004). Following are descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

Carbon Dioxide

Carbon dioxide (CO₂) is a colorless, odorless gas. CO₂ is emitted in a number of ways, both naturally and through human activities. The largest source of CO₂ emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO₂ emissions. The atmospheric lifetime of CO₂ is variable because it is so readily exchanged in the atmosphere (EPA, 2008).

Methane

Methane (CH₄) is a colorless, odorless gas that is not flammable under most circumstances. CH₄ is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (EPA, 2006a).

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

Nitrous Oxide

Nitrous oxide (N₂O) is a clear, colorless gas with a slightly sweet odor. N₂O is produced by both natural and human-related sources. Primary human-related sources of N₂O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N₂O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N₂O is approximately 120 years (EPA, 2006b).

Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, which has an atmospheric life of 14 years) (EPA, 2006c).

Perfluorocarbons

Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF₄), perfluoroethane (C₂F₆), perfluoropropane (C₃F₈), perfluorobutane (C₄F₁₀), perfluorocyclobutane (C₄F₈), perfluoropentane (C₅F₁₂), perfluorohexane (C₆F₁₄). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF₄ and C₂F₆ as by-products. The estimated atmospheric lifetimes for CF₄ and C₂F₆ are 50,000 and 10,000 years, respectively (EFCTC, 2003; EPA, 2006a).

Nitrogen Trifluoride

Nitrogen trifluoride (NF₃) is an inorganic, colorless, odorless, toxic, non-flammable gas used as an etchant in micro-electronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition (PECVD) chambers in the production of liquid crystal displays and silicon-based thin film solar cells. It has a global warming potential of 17,200 CO₂e. While NF₃ may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF₃ was listed by California as a High Global Warming Potential GHG to be listed and regulated under AB 32 (Section 38505 Health and Safety Code).

Sulfur Hexafluoride

Sulfur hexafluoride (SF₆) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF₆ is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF₆ produced worldwide. Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF₆ has an atmospheric life of 3,200 years (EPA, 2008).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global warming potential, such as HFCs, PFCs, NF₃, and SF₆, are the most heat-absorbent. Methane traps over 21 times

more heat per molecule than CO₂, and N₂O absorbs 310 times more heat per molecule than CO₂. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO₂e), which weight each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted. **Table 3.11-1** shows the GWPs for different GHGs for a 100-year time horizon.

**TABLE 3.11-1
GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES
(100-YEAR GIVEN TIME HORIZON)**

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous Dioxide (N ₂ O)	310
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)	6,500
Nitrogen Trifluoride (NF ₃)	17,200
Sulfur Hexafluoride (SF ₆)	23,900

Sources: USEPA, 2010a; IPCC, 2007

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO₂ in the world and produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (CEC, 2006). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (CEC, 2006). This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (CEC, 2006).

EFFECTS OF GLOBAL CLIMATE CHANGE

With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state – as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea-level rise, and ecological shifts.

Many scientists believe that these changes are accelerating – locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California is anticipated to face intensifying climate changes in coming decades (CNRA, 2009). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures, and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA, 2009).

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA, 2009):

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4 °F; (an increase one to three times as large as that which occurred over the entire 20th century).
- By 2100, the models project temperature increases between 3.6 to 9 °F.

Precipitation levels are expected to change over the 21st century, though models differ in determining where and how much rain and snowfall patterns will change (CNRA, 2009). 11 out of 12 precipitation models run by the Scripps Institution of Oceanography suggest a small to significant (12-35 percent) overall decrease in precipitation levels by mid-century (CNRA, 2009). In addition, higher temperatures increase evaporation and make for a generally drier climate, as higher temperatures hasten snowmelt and increase evaporation and make for a generally drier climate. Moreover, the 2009 California Climate Adaptation Strategy concludes that more precipitation will fall as rain rather than as snow, with important implications for water management in the state. California communities have largely depended on runoff from yearly established snowpack to provide the water supplies during the warmer, drier months of late spring, summer, and early autumn. With rainfall and meltwater running off earlier in the year, the state will face increasing challenges of storing the water for the dry season while protecting Californians downstream from floodwaters during the wet season.

There may be dramatic changes in average temperature and precipitation. In the next few decades, it is likely that the state will face a growing number of climate change-related extreme events such as heat waves, wildfires, droughts, and floods. Because communities, infrastructure, and other assets are at risk, such events can cause significant damages and are already responsible for a large fraction of near-term climate-related impacts every year (CNRA, 2009).

Most climate projections developed to date, produce gradual changes for a given climate variable. In the past, rapid climate changes have been observed and scientists are increasingly concerned about additional abrupt changes that could push natural systems past thresholds beyond which they could not recover. Such events have been recorded in paleoclimatological records but current global climate models cannot predict when they may occur again (CNRA, 2009). Such abrupt changes have been shown to occur over very short periods of time (a few years to decades) and thus represent the most challenging situations to which society and ecosystems would need to adapt (CNRA, 2009). Short of being able to predict such abrupt changes, scientists are focusing their attention on aspects of the climate and Earth system called "tipping elements" that can rapidly bring about abrupt changes.

Tipping elements refer to thresholds where increases in temperature cause a chain reaction of mutually reinforcing physical processes in the Earth's dynamic cycles. The most dangerous of these include the following: (CNRA, 2009)

- A reduction in Arctic sea ice, which allows the (darker) polar oceans to absorb more sunlight, thereby increasing regional warming, accelerating sea ice melting even further, and enhancing Arctic warming over neighboring (currently frozen) land areas.
- The release of methane (a potent GHG), which is currently trapped in frozen ground (permafrost) in the Arctic tundra, will increase with regional warming and melting of the ground, leading to further and more rapid warming and resulting in increased permafrost melting.
- Continued warming in the Amazon could cause significant rainfall loss and large scale dying of forest vegetation, which will further release CO₂.
- The accelerated melting of Greenland and West Antarctic Ice Sheets observed in recent times, together with regional warming over land and in the oceans, involves mechanisms that can reinforce the loss of ice and increase the rate of global sea-level rise.

According to the 2009 California Climate Adaptation Strategy, the impacts of global warming in California have the potential to include, but are not limited to, the following areas:

Public Health

Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially-isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves. (CNRA, 2009).

Floods and Droughts

The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease (CNRA, 2009). Additionally, impacts can include a loss of personal belongings, and the emotional ramifications from such loss, to direct injury and/or mortality.

Drinking water contamination outbreaks in the U.S. are associated with extreme precipitation events (CNRA, 2009). Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness. Flood waters may contain household, industrial and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water supplies (CNRA, 2009). Flooding may also overload storm and wastewater systems, or flood septic systems, also leading to possible contamination of drinking water systems (CNRA, 2009).

Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

agricultural and commercial fisheries), and risks of waterborne illness. As the amount of surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence (CNRA, 2009). Communities that utilize well water will be adversely effected both by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies (CNRA, 2009).

Water Resources

The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century – especially increases in hydrologic variability – will likely intensify in this century. California is anticipated to experience more frequent and larger floods and deeper droughts (CNRA, 2009). Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies (CNRA, 2009).

The County's domestic water sources are supplied through both local and imported water. For the entire County it is estimated that, on average, 85 percent of the domestic water is supplied by local sources with the balance of 15 percent is imported purchased water. Imported water is primarily purchased from the Metropolitan Water District of Southern California and the State Water Project (the California Aqueduct) (San Bernardino County 2006, p. IV-182).

To better understand how the future reliability of the State Water Project (SWP) and Central Valley Project (CVP) may be affected by climate change, the California Department of Water Resources (DWR) examined possible effects for 12 future climate scenarios in a report titled *Using Future Climate Projections to Support Water Resources Decision Making in California* (CEC, CALEPA, DWR, 2009). The 12 scenarios represent projections from six Global Climate Models for a higher and a lower future greenhouse gas emissions scenario. The studies also took into account Delta salinity intrusion due to sea level rise and resulting changes in reservoir operations to maintain Delta water quality (DWR 2010, p. 30). Shifts in both water supply and water demands were considered. Several factors related to water supply reliability were examined: annual Delta exports, reservoir carryover storage, Sacramento Valley groundwater pumping, and additional water supplies needed to reduce the frequency and extent of system vulnerability to operational interruption (DWR 2010, p. 30). For the range of future climate projections studied, the reliability of the SWP and CVP water supply systems is expected to be reduced (DWR 2010, p. 30).

One indicator of the amount of water that the SWP can supply south of the Delta is annual Delta exports, which is the total amount of water transferred (exported) south of the Delta through the SWP's Banks Pumping Plant and the CVP's Jones Pumping Plant over the course of one year. At midcentury, median Delta exports are reduced by 7 percent for the lower greenhouse gas emissions scenario and by 10 percent for the higher emissions scenario (DWR 2010, p. 30). It is important to note that the full range of mid-century changes in Delta exports for the 12 future climate scenarios spans an increase of 2 percent to a decrease of 19 percent (DWR 2010, p. 30). These decreases in annual Delta exports would reduce water deliveries south of the Delta (DWR 2010, p. 30).

Agriculture

Increased GHG emissions could cause widespread changes to the agriculture industry, reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply they need. California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less than optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits, and nuts. In addition, continued global climate change could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued global climate change could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085 (CNRA, 2009). However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Over the 20th century, sea level has risen by about seven inches along the California coast (CNRA, 2009). It is projected that sea-level rise of up to 55 inches (1.4 meters) could occur by the end of this century (CNRA, 2009). This projection accounts for the global growth of dams and reservoirs and how they can affect surface runoff into the oceans, but it does not account for the possibility of substantial ice melting from Greenland or the West Antarctic Ice Sheet, which would drive sea levels along the California coast even higher (CNRA, 2009).

3.11.2 REGULATORY FRAMEWORK

FEDERAL

Federal Regulation and the Clean Air Act

In the past, the U.S. Environmental Protection Agency (EPA) has not regulated GHGs under the Clean Air Act because it asserted that the act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the U.S. Supreme Court held that the EPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, twelve states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007)). The Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. In 2009 EPA responded to this ruling and made an endangerment finding that GHGs pose a threat to the public health and welfare. That was the first step necessary for the establishment of federal GHG regulations under the Clean Air Act.

In April 2010, EPA issued the final rule on new standards for GHG emissions and fuel economy for light-duty vehicles in model years (MY) 2017-2025. In November 2010, EPA published the "Prevention of Significant Deterioration (PSD) and Title V Permitting Guidance for Greenhouse Gases," which provides the basic information that permit writers and applicants need to address GHG emissions regulated under the Clean Air Act. In that document EPA described the "Tailoring Rule" in the regulation of GHG emissions. With the Tailoring Rule, EPA established a phased schedule in the regulation of stationary sources. The first phase of the "Tailoring Rule" began January 2, 2011 and focuses the GHG permitting programs on the largest sources with the most Clean Air Act permitting experience. Then, in step two beginning June 1, 2011, the rule expands to cover large sources of GHGs that may not have been previously covered by the Clean Air Act for other pollutants. The rule also describes EPA's commitment to future rulemaking that will describe subsequent steps of the "Tailoring Rule" for GHG permitting (USEPA 2010b).

STATE

Assembly Bill 1493

Assembly Bill (AB) 1493 (Pavley) of 2002, (Health and Safety Code Sections 42823 and 43018.5), requires the California Air Resources Board (CARB) to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as "Pavley I." The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the CAA, to allow the State to require reduced tailpipe emissions of CO₂. In late 2007, the U.S. Environmental Protection Agency (USEPA) denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the USEPA related to this denial.

In January 2009, President Obama instructed the USEPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the USEPA granted California's waiver request enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the United States. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon (mpg) by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order S-3-05

Executive Order S-3-05 (state of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of CalEPA created a Climate Action Team (CAT) made up of members from various state agencies and commissions. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

Assembly Bill 32 (AB 32), (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561-38565, 38570, 38571, 38574, 38580, 38590, 38592-38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO₂, CH₄, N₂O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32, directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

Senate Bill 1368

Senate Bill 1368 (SB 1368) (codified at Public Utilities Code Chapter 3), is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a greenhouse gas emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Climate Change Scoping Plan

In October of 2008, CARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32. The scoping plan contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO₂e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO₂e under a business-as-usual scenario (this is a reduction of 42 MMT CO₂e, or almost 10 percent, from 2002–2004 average emissions). The scoping plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations are from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO₂e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO₂e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO₂e), and a renewable portfolio standard for electricity production (21.3 MMT CO₂e). CARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the proposed scoping plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. (Meanwhile, CARB is also developing an additional protocol for community emissions.) CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The proposed scoping plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the proposed scoping plan expects approximately 5.0 MMT CO₂e will be achieved associated with implementation of SB 375, which is discussed further below. The Climate Change Scoping Plan was approved by CARB on December 11, 2008.

The status of the Climate Change Scoping Plan is currently uncertain as a result of a tentative court decision in the case of Association of Irrigated Residents v California Air Resources Board (San Francisco Superior Court Case No. CPF-09-509562). In a January 24 tentative statement of decision, the court found that the CARB, in its CEQA review, had not adequately explained why it selected a scoping plan that included a cap and trade program rather than an alternative plan. This decision has not been finalized, but CARB may be required to revise the CEQA review (a functional equivalent document) before proceeding further with the AB 32 scoping plan. The decision did not reject any of the substantive aspects of the scoping plan included in the formulation of the R1 measures listed in the GHG plan, and based upon that, the court decision when finalized, and possible CARB action in response to the decision, is not expected to affect the substantive content of the Scoping Plan measures.

California Climate Action Registry

The California Climate Action Registry (CCAR) was established in 2000 by Senate Bill 1771 (codified at Health and Safety Code Article 6 and Public Resources Code Chapter 8.5) and modified in 2001 by Senate Bill 527 (codified at Health and Safety Code Sections 42400.4, 42801, 42810, 42821-42824, 42840-42843, 42860, 42870, 43021, 42410, 42801.1, 43023) as a nonprofit voluntary registry for GHG emissions. The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry. The California Climate Action Registry has now merged its GHG emissions registry with the climate registry and is primarily focused on offset projects and research.

Senate Bill 1078 and Governor's Order S-14-08 (California Renewables Portfolio Standards)

Senate Bill 1078 (SB 1078) (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. SB 1078 changed the target date of this bill's implementation to 2010. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewable Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target.

Senate Bill 375

Senate Bill 375 (SB 375) (codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.01, 65584.04, 65584.04, 65587, 65588, 14522.1, 14522.2, 65080.01 and Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

Executive Order S-13-08: The Climate Adaptation and Sea Level Rise Planning Directive

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08 in order to reduce and assess California's vulnerability to climate change and sea level rise. The Executive Order initiated four major actions:

- Initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009;

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

- Request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts;
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and
- Initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise. This report was released in 2009 as the California Adaptation Strategy (CNRA, 2009).

The Executive Order will provide consistency and clarify to state agencies on how to address sea level rise and other climate change related impacts in current planning efforts.

Senate Bill 104 (Updating the list of GHGs regulated under AB 32)

Senate Bill 104 (SB 104), adopted in October 2009, authorizes the California Air Resources Board to regulate nitrogen trifluoride, as a GHG. Nitrogen trifluoride is a gas emitted during the etching process during the manufacturing of various electronic products including televisions, computer monitors, solar panels and microprocessors. SB 104 adds nitrogen trifluoride to the list of GHGs regulated by the California Air Resources Board under AB 32. The California Air Resources Board has developed and adopted a variety of rules to reduce fluorinated gas emissions (HFC, PFC, and SF₆) in semiconductor and related electronic device manufacturing. Passage of this bill adds nitrogen trifluoride to the list of fluorinated gases regulated under the California Air Resources Board rules on semiconductor and related electronic manufacturing (CARB, 2009).

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. On January 12, 2010, the California Building Standards Commission adopted CALGREEN and became the first state in the United States to adopt a statewide green building standards code. CALGREEN will require new buildings to reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low pollutant-emitting materials.

LOCAL

South Coast Air Quality Management District

As the regulatory agency responsible for establishing air quality analysis methodologies and comprehensive efforts to establish regional and localized significance thresholds for criteria pollutants, local public agencies have asked the South Coast Air Quality Management District (SCAQMD) for guidance in quantifying GHG impacts and recommending GHG significance thresholds to assist them with determining whether or not GHG impacts in their CEQA documents are significant. To date, SCAQMD has only proposed a GHG significance threshold that applies to industrial (stationary source) projects where SCAQMD is the lead agency. In that threshold, SCAQMD has defined industrial projects as those requiring Title V permitting. Most land uses defined as industrial in the County's General Plan Update, SCAQMD considers as commercial projects, and are therefore, not covered under the Title V permitting process.

At the writing of this document, SCAQMD staff is recommending consideration of an interim GHG significance threshold that would apply to stationary source/industrial projects where the AQMD is the lead agency under CEQA. The types of projects that the staff proposal would apply to include: AQMD rules, rule amendments, and plans, e.g., Air Quality Management Plans. In addition, the AQMD may be the lead agency under CEQA for projects that require discretion approval, i.e., projects that require discretionary air quality permits from the AQMD.

Mojave Desert Air Quality Management District

The Mojave Desert Air Quality Management District (MDAQMD) is the air quality regulating authority with jurisdiction over the desert portion of San Bernardino County, known as the Mojave Desert Air Basin (MDAB). The MDAB includes a portion of Kern County, Los Angeles County, Riverside County, and San Bernardino County. MDAQMD does not offer guidance for addressing the GHG emissions associated with plan updates and does not currently have an adopted threshold of significance for GHG emissions.

Green County San Bernardino

In August 2007, the Board of Supervisors launched Green County San Bernardino to spur the use of "green" technologies and building practices among residents, business owners and developers in the County. For example, developers doing business in the county are encouraged to participate in San Bernardino County's Green Building Program, which emphasizes sustainable building practices in order to reduce environmental impacts during construction and throughout the life of both residential and commercial buildings. Developers participating in this program can earn a "green building designation" by following any of the green rating systems of either California Green Builder (CGB), Leadership in Energy and Environmental Design (LEED), any County-approved green rating program or the County's Green Building Basics Checklist. In return, builders receive accelerated plan review, priority inspections, design assistance and recognition for all qualified projects.

San Bernardino County requires new buildings, proposed for development in the County to meet a stringent building rating standard established by the United States Green Building Council. The rating standard, known as LEED, is the nationally accepted benchmark for the design, construction and operation of high performance "green" buildings. By adopting LEED building standards, the County is reducing its energy consumption, construction waste, water usage, and thus carbon dioxide emissions. Adhering to LEED standards drives up the one-time cost of construction, but, in the long run, significantly reduces utility expenses. The County's 1st LEED certified building is the Crestline Library, located at 24105 Lake Drive in Crestline.

Additionally, Green County San Bernardino includes a public awareness component aimed at educating residents about steps they can take in their daily lives to conserve resources and protect the environment.

3.11.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Per Appendix G of the California Environmental Quality Act (CEQA) Guidelines, impacts related to climate change are normally considered significant if implementation of the proposed Project would result in any of the following:

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

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

The project proposes to amend the General Plan to include a policy addressing the County's intention to reduce GHG emissions that are reasonably attributable to: (1) the County's internal activities, services, and facilities; and (2) private industry and development that is located within the area subject to the County's land use and building permit authority.

For the purposes of this analysis, the General Plan Amendment, GHG Plan and Development Code Amendment will be compared for consistency with AB 32 reduction targets to determine significance. The AB 32 reduction target has been determined as the reduction of statewide GHG emissions to 1990 levels by 2020, or as outlined in the AB 32 Scoping Plan, the functional equivalent of 15 percent below "current" (2005-2008) levels by 2020.

The General Plan Amendment, GHG Plan and Development Code Amendment (the GHG Plan is provided in **Appendix B**) will have to decrease both county Internal and External¹ emissions to a level at least 15 percent below current emissions by the year 2020 in order to be considered less than significant.

The County General Plan Final EIR included a discussion of climate change, greenhouse gas and AB 32. This discussion includes identification of the goals of AB 32 as well as the regulatory evolution of addressing greenhouse gases in California. In this discussion the County acknowledges that the County and businesses within the County will be subject to AB 32 and the regulations that will be implemented by CARB to achieve the emissions reductions goals of AB 32. The County General Plan Final Program EIR includes a general disclosure of the General Plan's air quality impacts, and in this disclosure includes emissions of greenhouse gases. Based upon the absence of regulatory guidance and other factors, the General Plan EIR provided a general disclosure of greenhouse gas emissions and climate change impacts, and did not make a specific finding of significance regarding those impacts. Given the adoption of the CEQA Guidelines provisions governing greenhouse gas emissions and related developments, it is now possible for the County to evaluate the impacts of the proposed General Plan Amendment, the GHG Reduction Plan, and the associated Development Code amendments pursuant to the provisions.

Methodology

The County has determined that the project's potential for creating an impact on global climate change should be based on a comparative analysis of the GHG Plan against AB 32 targets in the year 2020 and progress towards Executive Order S-3-05 targets in the year 2030. In order for California to meet the goals of AB 32, emissions will need to be reduced by 15 percent below current levels by 2020. San Bernardino County would also need to achieve the same GHG targets in order to be consistent with AB 32. CARB states, "... ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction

¹ External emissions include GHG emissions produced by private industry and development that is located within the area subject to the County's discretionary land use authority and its ministerial building permit authority (the "External Emissions Inventory"). Internal emissions include GHG emissions associated with the County's services and internal operations (the "Internal Inventory").

target.” For the purpose of defining “existing” emission levels, the County chose the emissions in the year 2007 as a benchmark for existing emissions conditions.

As previously stated, two separate emission inventories were prepared for the County's GHG Inventory and Reduction Plan (GHG Plan): an External Inventory and an Internal Inventory. The External Inventory includes GHG emissions produced by the unincorporated communities, private industry, and development that is located within the area subject to the County's discretionary land use authority and its ministerial building permit authority (the “External Inventory”). The Internal Inventory includes GHG emissions associated with the County's governmental activities, services, and internal operations (the “Internal Inventory”). The unit of measure used is the metric ton of carbon dioxide (CO₂) equivalent (MTCO_{2e}). MTCO_{2e} is the international unit that combines the differing impacts of all GHGs into a single unit, by multiplying each emitted gas by its global warming potential (see **Table 3.11-1**).

A number of widely accepted protocols for estimating GHG emissions were used to prepare the County's Internal and External inventories. These include:

- California Air Resources Board (CARB) Local Governments Operations Protocol (LGOP) (2008). This protocol is the standard for estimating emissions resulting from government buildings and facilities, government fleet vehicles, wastewater treatment and potable water treatment facilities, landfill and composting facilities, and other operations.
- California Climate Action Registry (CCAR) and General Reporting Protocol (2009). This protocol provides guidance for preparing GHG inventories in California.
- CARB California Greenhouse Gas Inventory Data 1990–2006 (2009). CARB's documentation provides background methodology, activity data, protocols, and calculations used for California's statewide inventory.
- California Energy Commission (CEC) Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (2006). This inventory provides useful methodology and emission factors for statewide GHG emissions inventorying.
- U.S. Environmental Protection Agency (USEPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007 (2009). This inventory provides useful methodology and emission factors for nationwide GHG emissions inventorying.
- Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006). This document is the international standard for inventories and provides much of the baseline methodology used in the national and statewide emission inventories.

The GHG emissions reduction measures identified in the GHG Plan include existing and proposed state, regional, county, and other local measures that would reduce GHG emission in the internal and external categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures, i.e., state, regional, or local, and also whether the measure is quantifiable in terms of calculating a volume of emission reduction. Emission reductions for the R1 measures were based on CARB methodology, as presented in the AB 32 Scoping Plan. R2 measures were calculated using County-specific assumptions, where available, and custom methodologies for each sector of emission reductions presented. The reduction methodologies for each emissions sector are based on a combination of widely accepted protocols established by USEPA, CCAR, CARB, and other relevant protocols, as

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

appropriate, or on scientific studies. While emission reductions are expected for R3 measures, they were not used to demonstrate achievement of the proposed County 2020 GHG emission reduction target because either there was a lack of available data or protocols required for quantification and/or uncertainty regarding the County's jurisdictional control over relevant emission sources related to the measure.

Consistency with AB 32 and the AB 32 Scoping Plan

Impact 3.11.1 Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would implement a number of activities to reduce greenhouse gas emissions that are under the County's jurisdiction to implement. The proposed Project's GHG reducing activities are consistent with the early emission reduction targets contained in AB 32 the AB 32 Scoping Plan Report. **Thus, the proposed Project would not result in a new significant impact relating to GHG emissions, which was evaluated in the General Plan EIR without a finding of significance. There is no new or substantially more severe significant impact.**

According to the GHG Plan, the External Inventory of unmitigated emissions at 2020 from County operations and growth would be 7,586,908 metric tons (MT) of carbon dioxide equivalent (CO₂e) and the Internal Inventory of unmitigated emissions at 2020 would be 517,221 MTCO₂e (San Bernardino County 2010b, Chapter 3).

EXTERNAL EMISSIONS

The County's 2007 emissions and 2020 unmitigated emissions for External Inventories are presented in **Table 3.11-2** by major sector. The largest source of GHG emissions in 2007 is stationary source emissions, followed by on-road transportation. Unmitigated year 2020 emissions are based on current emissions, scaled by sector specific growth rates. The primary source of stationary source emissions is cement plants. The County has very limited jurisdictional control over the operations of existing plants. The two air quality management districts that regulate air quality in San Bernardino County, South Coast Air Quality Management District (SCAQMD) and Mojave Desert Air Quality Management District (MDAQMD), have primary regulatory authority with regards to cement plant air emissions. Of the eleven cement plants located in California, four are located in the County. Three are located in the unincorporated area of the County and one is located in the City of Victorville. The three (3) cement plants that are located in the unincorporated portion of the County represent approximately 30 percent of GHG emissions from cement production in California (San Bernardino County 2010b, Chapter 3).

**TABLE 3.11-2
EXTERNAL EMISSIONS INVENTORY SUMMARY FOR 2007 (BASELINE)
AND UNMITIGATED YEAR 2020 (MTCO₂E)**

External Inventory Existing and Unmitigated Emissions Projections (MTCO ₂ e)				
Sector	Existing		2020	
	Emissions	Percentage	Emissions	Percentage
Stationary Sources	2,866,435	45.8	3,173,592	41.8
Transportation: On-road	1,631,666	26.1	2,176,132	28.7
Off-road	157,185	2.5	235,054	3.1
Building Energy Use: Industrial	593,716	9.5	760,834	10.0
Residential	440,851	7.1	467,217	6.2
Commercial	246,364	3.9	314,603	4.1
Solid Waste/Landfills	213,191	3.4	359,318	4.7
Agriculture	64,619	1.0	50,991	0.7
Water-Related: Wastewater	27,994	0.4	35,525	0.5
Water Conveyance	10,696	0.2	13,211	0.2
Miscellaneous (residential fires and cooking)	346	0.01	431	0.01
Total	6,253,063	100	7,586,908	100

Source: San Bernardino County 2011b, Appendix A of the GHG Plan

INTERNAL EMISSIONS

The County's 2007 and unmitigated year 2020 Internal Inventories are presented in **Table 3.11-3** by major sector. The largest source of GHG emissions is methane from waste management (approximately 61 percent). The next largest sector after waste is electricity and natural gas consumption by County-owned and leased facilities (approximately 19 percent). In order of decreasing magnitude, the remaining sectors are County vehicle fleet emissions (approximately ten [10] percent), employee commute emissions (approximately ten [10] percent), water pumping and treatment facilities (approximately one [1] percent) under County jurisdiction, and streetlights (approximately one-tenth of a percent (San Bernardino County 2010b, Appendix B of the GHG Plan).

The waste emissions from County-owned landfills are under the direct control of the County and, therefore, included in the Internal Inventory. Unlike most of the energy-related emissions (which are associated with the activities of the County government's operations), the landfill emissions are a result of waste that has been generated by the entire San Bernardino population (incorporated and unincorporated areas) since the landfills were first opened. As a result, the waste emissions are significant and dominate other sectors in the internal inventory (San Bernardino County 2010b, Appendix B of the GHG Plan).

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

**TABLE 3.11-3
INTERNAL EMISSIONS INVENTORY SUMMARY FOR 2007 (BASELINE)
AND UNMITIGATED YEAR 2020 (MTCO₂E)**

Internal Inventory Existing and 2020 Unmitigated Emissions Projections (MTCO ₂ e)				
Sector	Existing		2020	
	Emissions	Percentage	Emissions	Percentage
Solid Waste/Landfills	206,817	60.9	342,480	66.2
County Facilities	62,981	18.5	84,915	16.4
County Vehicle Fleet	34,958	10.3	42,526	8.2
Employee Commute	32,490	9.6	42,869	8.3
Water Pumping and Wastewater Treatment	2,192	0.7	4,114	0.8
Outdoor Lighting	276	0.1	317	0.1
Total	339,714	100	517,221	100

Source: San Bernardino County 2010b, Appendix B of the GHG Plan

GHG Emissions Reduction Measures

As previously mentioned, in order for the County to achieve consistency with AB 32, baseline emissions will need to be reduced by 15 percent by 2020 (to 5,296,034 MTCO₂e for External Emissions and to 256,712 MTCO₂e for Internal Emissions).

The GHG Plan describes the reduction strategies currently being employed by the County, as well as those that will be employed by the County, through implementation of the GHG Plan, and by the State, through a variety of legislation and regulations. The combination of existing reduction strategies and proposed new strategies identified in the GHG Plan will be assembled into an integrated plan to reduce the countywide GHG emissions level. In addition, proposed new private developments will also contribute to GHG emissions reduction through the County's GHG development review process, AB 32 requirements, and other state initiatives.

The reduction strategies discussed in the GHG Plan correspond to the reduction measures described in GHG Plan Appendix A for the External Inventory and Appendix B for the Internal Inventory (reduction measures). For purposes of this section, the term "reduction strategy" and "reduction measure" have the same meaning. Following the description of each County implemented GHG Plan reduction strategy, is a specific reference to the corresponding reduction measure found in the Appendices. Where the reduction strategy is quantified, the amount of emissions reduction and methodology is set forth in the Appendices A and B of the GHG Plan.

The GHG emissions reduction measures identified in the GHG Plan include existing and proposed state, regional, county, and other local measures that would reduce GHG emission in the internal and external categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures, i.e., state, regional, or local, and also whether the measure is quantifiable in terms of calculating a volume of emission reduction. The emissions reduction measures are organized as follows, for each sector:

- Reduction Class 1 (R1) includes adopted, implemented, and proposed state and regional measures that do not require additional County action and that will result in

GHG reductions for the County's land use authority area and internal operations. These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.

- Reduction Class 2 (R2) includes all quantifiable measures that have been implemented or will be implemented by the County, as well as any additional quantifiable measures that require County action and will further reduce the GHG emissions for the County's LUA area and internal operations. R2 also includes any state and regional measures that require substantial action by the County to achieve the expected GHG reductions.

The R2 measures include specific quantifiable measures as well as reductions achieved through the development review process.

Measurable reductions of GHG emissions will be achieved through the County's GHG Development Review Process (DRP) by applying appropriate reduction requirements as part of the discretionary approval of new development projects. Through its development review process, the County will implement CEQA by requiring new development projects to quantify project GHG emissions and adopt feasible mitigation to reduce project emissions below a level of significance.

Mitigation of GHG emissions impacts through the DRP provides one of the most substantial reduction strategies for reducing external emissions. The DRP procedures for evaluating GHG impacts and determining significance for CEQA purposes will be streamlined by (1) applying a uniform set of performance standards to all development projects, and (2) utilizing Screening Tables to mitigate project GHG emissions. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions. A review standard of 3,000 metric tons per years (MTY) will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions. The review standard of 3,000 MTY and the Screening Tables are described in Appendix F.

As part of the implementation of the County GHG Plan, a uniform set of performance standards will be applied to development projects. These performance standards will be added to the County Development Code to ensure consistent application during development review. The complete Development Review Process, including the use of performance standards, for assessing and mitigating GHG emissions is outlined below.

- a) **County Performance Standards.** All development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 MTCO_{2e} per year will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Performance Standards and the methodology relating to the 3,000 MTCO_{2e} per year level.)
- b) **Regulatory Agency Performance Standards.** When, and if, South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

- c) **Projects Using Screening Table.** For projects exceeding 3,000 MTCO₂e per year of GHG emissions, the County will use Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. Projects that garner a 100 or greater points would not require quantification of project specific GHG emissions. The point system was devised to ensure project compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those from existing development, will allow the County to meet its 2020 target and support longer-term reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Screening Tables and methodology.)
- d) **Projects Not Using Screening Tables.** Projects exceeding 3,000 MTY of GHG emissions that do not use the Screening Tables, will be required to quantify project-specific GHG emissions or otherwise demonstrate that project specific GHG emissions achieve the equivalent level of GHG emissions reduction as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of this alternative GHG mitigation analysis and methodology.)
- e) **Residential Projects Located Outside City Sphere of Influence.** Residential Projects (or mixed use projects with a residential component) in excess of 250 dwelling units that are located in unincorporated area not within a City Sphere of Influence (SOI) will not be eligible to use the Screening Tables or rely on the Plan for a determination of less than significant on individual or cumulative impact for GHG emissions. These projects must perform an independent project-specific evaluation of GHG emissions and present project-specific conclusions regarding significance of GHG emissions impacts. (See Appendix F for a full description of the mitigation analysis and methodology for these projects)
- f) **Projects Requiring EIR.** This process shall not be construed as limiting the County's authority to require an EIR and if needed to adopt a statement of overriding consideration for projects with significant GHG Impacts.

The County will monitor the emissions reductions from new development, calculate those emissions and make any needed modifications to the County's reduction strategies to enable the County to reach its 2020 target.

- Reduction Class 3 (R3) includes additional measures that were not used to demonstrate achievement of the proposed County 2020 GHG emissions reduction target. For these measures, emissions reductions have either not been quantified due to a lack of available data or protocols required for quantification or because of uncertainty regarding the County's jurisdictional control over relevant emissions sources. Some of these measures are quantifiable but require additional refinement and are therefore not included in R1 or R2.

No federal measures were relied upon to achieve the reduction targets included in the GHG Plan because of the uncertainty surrounding federal action at this time. These measures are listed in Tables 2-5 through 2-13 in Chapter 2, Project Description.

The GHG reduction measures of the GHG Plan would substantially reduce projected unmitigated year 2020 emissions. The GHG Plan includes both External and Internal reduction measures to address the resultant emissions of buildings (associated with energy use), transportation and land use emissions, solid waste emissions, industrial fuel combustion and process emissions, agriculture emissions, emissions generated for the energy used to pump water, County fleet emissions, County operated landfills, and the emissions from County workers commuting to their jobs.

For instance, measure R2E1, Residential Energy Efficiency Retrofit, is a Countywide program for energy efficient retrofits (emissions reduction of 1.2 percent from 2020 unmitigated levels). Retrofits would include various energy efficiency upgrades, including improvements to HVAC systems, water heating systems, or the building envelope (windows/insulation). This measure would be implemented through a combination of County permitting for major renovations and incentives for homeowners to retrofit their properties. Similarly, reduction measure R2E10, Commercial and Industrial Rehabilitation/Expansion Renewable Energy, concerns installation of solar (or other renewable) energy in commercial and industrial projects requiring discretionary permits for major rehabilitations or expansions (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) of commercial, office, or industrial development greater than or equal to 25,000 square feet in size (emissions reduction of 1.4 percent from 2020 unmitigated levels).

As another example, reduction measure R2T1, Anti-Idling Enforcement (emissions reduction of 0.5 percent from 2020 unmitigated levels), would be adopted by the County with implementation of the GHG Plan. This measure would consist of an anti idling ordinance requiring all discretionary land use projects approved by the County and all business establishments that use diesel vehicles or off-road equipment as part of their normal business operations to be required to limit vehicles/off-road equipment idling on site for periods in excess of five minutes. Measure R2T2, Employment Based Trip and VMT Reduction Policy would require creating County commuter-choice programs, employer transportation management, guaranteed ride-home programs, and commuter assistance and outreach (emissions reduction of 0.1 percent from 2020 unmitigated levels). This measure expands upon SCAQMD Rule 2202 (Employee Commute Reduction Program).

GHG reduction measures would result in GHG reductions for the municipal solid waste management sector. The County proposes the implementation of a methane recovery system at Barstow Landfill (R2W2). In 2020, the reductions associated with the Barstow site are estimated at 10,970 MTCO₂e from waste already in place at the landfill. The County can further reduce emissions by installing a methane recovery system at Landers as proposed in the GHG Plan (R2W3) (emissions reduction of 2.4 percent from 2020 unmitigated levels). There are many more examples of GHG internal reduction measures proposed under the GHG Plan (see **Appendix B**).

External Reduction Quantification

External emission reductions are classified into the following six sectors: Building Energy Use (including both Energy Efficiency and Alternative Energy), Transportation and Land Use, Solid Waste/Landfills, Stationary Sources, Agriculture and Resources Conservation and Water Conservation. Internal emission reductions are classified into the following four sectors: Solid Waste/Landfills, Building Energy Use, Vehicle Fleet, Employee Commute. For each sector, reduction strategies have been developed that achieve the County's 2020 emissions reduction target.

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

As summarized in **Table 3.11-4**, the sum of the External reduction measures meets the emissions reduction necessary to attain the 2020 emissions target.

**TABLE 3.11-4
EXTERNAL GHG EMISSIONS REDUCTIONS FROM
GHG PLAN REDUCTION MEASURES (MTCO₂E)**

External Emissions Inventory	
2007 Baseline Emissions Inventory	6,253,063
2020 Unmitigated Emissions Inventory	7,586,908
Reductions from 2020 Inventory	
Building / Energy Reductions	-494,698
Transportation and Land Use Reductions	-528,423
Municipal Solid Waste Management Reductions	-206,960
Industrial Fuel Combustion and Process Emission Reductions	-1,049,068
Agricultural Emission Reductions	-1,531
Water Conveyance	-10,193
Total Emissions Reductions (External Inventory)	-2,290,873
GHG Plan	
AB 32 Emissions Target (15% below 2007 Baseline Inventory)	5,315,104
2020 GHG Plan Inventory	5,296,035
Target Achieved?	Yes

The County would have to achieve an External GHG emissions inventory of 5,315,104 MTCO₂e or less by the year 2020 in order to be compliance with AB 32. This target represents a 15 percent reduction of GHG emissions from the 2007 Baseline inventory (a reduction of 937,959 MTCO₂e), and a reduction of 2,271,804 MTCO₂e from the project 2020 BAU scenario. As shown in **Table 3.11-4**, the County would meet the emissions reduction necessary for External emissions under the proposed Project.

Internal Reduction Quantification

As summarized in **Table 3.11-5**, the sum of the internal reduction measures exceeds the emissions reduction necessary to attain the 2020 emissions target.

The County would have to achieve an Internal GHG emissions inventory of 288,758 MTCO₂e or less by the year 2020 in order to be compliance with AB 32. This target represents a 15 percent reduction of GHG emissions from the 2007 Baseline inventory (a reduction of 50,958 MTCO₂e), and a reduction of 228,463 MTCO₂e from the project 2020 BAU scenario. As shown in **Table 3.11-5**, the County would meet the emissions reduction necessary for Internal emissions under the proposed Project.

**TABLE 3.11-5
INTERNAL GHG EMISSIONS REDUCTIONS FROM
GHG PLAN REDUCTION MEASURES (MTCO₂E)**

Internal Emissions Inventory	
2007 Baseline Emissions Inventory	339,714
2020 Unmitigated Emissions Inventory	517,221
Reductions from 2020 Inventory	
Building / Energy Reductions	-32,872
County Fleet & Fuel Reductions	-15,646
Solid Waste / Landfill Reductions	-206,960
County Employee Commute Reductions	-4,651
Total Emissions Reductions (Internal Inventory)	-260,129
GHG Plan	
AB 32 Emissions Target (15% below 2007 Baseline Inventory)	288,758
2020 GHG Plan Inventory	257,092
Target Achieved?	Yes

The GHG Plan quantifies the GHG equivalent of state, regional, and local reduction policies and efforts. State reduction measures are quantified using the methodology included in the Assembly Bill (AB) 32 Scoping Plan and Technical Appendices (CARB 2008). Regional and local reductions are quantified with the best available methodology from agencies and associations such as the California Environmental Protection Agency (CalEPA), California Climate Action Registry (CCAR), and California Energy Commission (CEC). The GHG reduction potential is clearly and comprehensively documented and is sound. The implementation of the proposed Project would be consistent with state measures to reduce greenhouse gas emissions. The proposed Project will be consistent with AB 32. **Thus, there is no new or substantially more severe significant impact.**

Climate Change Environmental Effects on the County

Impact 3.11.2 Subsequent implementation of the General Plan in combination with reduction measures under the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment could be exposed to environmental effects associated with climate change. While the exact extent of the environmental effects of climate change on San Bernardino County is not known at this time, current General Plan policies and other state and local provisions address these effects. Amending the General Plan to add the GHG reduction policy and adopting the proposed GHG Plan would not increase impacts of climate. **Thus the proposed Project would not result in a new significant impact relating to the effect of GHG emissions on the County, which was evaluated in the General Plan EIR without a finding of significance. There is no new substantially more severe significant impact.**

As identified above, there are several technical studies regarding the environmental effects of climate change on the Earth as well as California. Several adverse environmental effects have

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

been identified that are projected to impact California over the next century. However, the extent of these environmental effects are still being defined as climate modeling tools become more refined. Potential environmental effects of climate change that could significantly impact San Bernardino County could include the following (which were previously noted above):

- Adverse impacts on water supply availability;
- Increased severity of flooding events;
- Increased wildland fire hazards;
- Alteration of natural habitats and impacts to biological resources;
- Adverse impacts on agricultural resources; and
- Adverse impact to public health.

Impacts on Water Supply

The County General Plan contains several policies and programs that address environmental effects on these resources. For instance, General Plan Policy CI 11.7 calls for the County to assist in the development of additional conveyance facilities and use of groundwater basins to store surplus surface or imported water. This strategy is important because as described above, the reliability of the SWP and CVP water supply systems is expected to be reduced (DWR 2010, p. 30). Furthermore, Policy CI 11.9 encourages water conservation, replenishment programs, and water sources in areas experiencing difficulty in obtaining timely or economical water service from existing potential suppliers, and Policy CI 11.12 states that prior to approval of new development, the County will ensure that adequate and reliable water supplies and conveyance systems are available to support the development, consistent with coordination between land use planning and water system planning.

Furthermore, the California DWR, in collaboration with the State Water Resources Control Board, other state agencies, and numerous stakeholders, has initiated a number of projects to begin climate change adaptation planning for the water sector including the development of an adaptation strategy entitled, *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. This report details how climate change is already affecting the state's water supplies and sets forth ten adaptation strategies to help avoid or reduce climate change impacts to water resources, such as water conservation strategies, the enhancing wetland ecosystems, and the expansion of water storage and conjunctive management of surface and groundwater resources to name three of the ten strategies. Other strategies include fixing the Sacramento- San Joaquin Delta water supply system, water quality, and ecosystem conditions, the practice of integrated flood management, and the provision for sustainable funding for statewide and integrated regional water management (DWR, 2008).

According to the adaptation strategies of state water report (DWR, 2008); all Urban Water Management Plans must include provisions to fund and implement all economic, feasible, and legal urban best management practices established by the California Urban Water Conservation Council. Best management practices include residential ultra-low flush toilet replacement programs, conservation pricing, large landscape conservation, and high efficiency clothes washer rebates (DWR 2008, p. 13). In addition, the Water Conservation in Landscaping Act of 2006 (AB 1881) required DWR to update the existing Model Water Efficient Landscape Ordinance (model ordinance) (DWR 2008, p. 13). Under this ordinance, local agencies in the

state are required to adopt either the updated model ordinance or its own local landscape ordinance that is at least as effective. The updated model ordinance reflects new technology and advances in landscape water management and seeks to increase outdoor water conservation through improved landscape design, management and maintenance. In addition the ordinance provides guidance to local agencies in developing and adopting landscape ordinances leading to water savings, which will reduce water demand, waste and water-related energy use (DWR 2008, p. 13).

The ultimate goal of the water conservation measures highlighted in the report is to achieve a statewide 20 percent reduction in per capita water use in 2020 (DWR 2008, p. 12).

The state is currently involved in four major planning efforts to evaluate Sacramento- San Joaquin Delta water supply issues and to recommend strategies and actions for their improvement — the Delta Vision, Bay-Delta Conservation Plan (BDCP), Delta Risk Management Strategy (DRMS), and Delta Regional Ecosystem Restoration Implementation Plan (DRERIP). These efforts are complementary but each process has a specific focus. All are considering the impacts of climate change on the Delta as well as a number of response strategies. Together, they will provide a set of adaptive strategies and actions that are comprehensive, consistent and build upon each other to improve the Delta ecosystem and water supply reliability. This is important as the entire county is estimated to receive, on average, 15 percent of its domestic water from imported purchased water. Imported water is primarily purchased from the State Water Project, which pumps water from the Sacramento- San Joaquin Delta.

Increased Severity of Flooding Events

Regarding the increased threat from flooding, General Plan Policy § 5.1 mandates that the County participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains. In addition, General Plan provision § 5.1 Program 1 designates Floodway and Floodplain areas, as identified by the FEMA on flood insurance rate maps and flood boundary maps. These two provisions ensure that flood prone areas are identified and recognized ahead of any development. When no mapped data exist, existing topographical, watershed, and drainage course data will be evaluated for a determination of potential flood hazard for every discretionary and ministerial action (§ 5.1 Program 8). In addition, General Plan provision § 5.1 Program 2 states that designated floodway areas will be preserved for non-structural uses through restrictions of the Flood Way Land Use Zoning District. § 5.1 Program 3 states that all new development, including filling, grading, and construction, proposed within designated floodplains, will require submission of a written assessment prepared by a qualified hydrologist or engineer, in accordance with the latest “San Bernardino County Hydrology Manual” and the various detention basin policies, to determine whether the development will significantly increase flood hazards and to show that all new structures will be adequately protected. § 5.1 Program 3 further states that development will be conditioned on receiving approval of this assessment by the San Bernardino County Surveyor Division of the Public Works Department.

Chapter 82.14 of the Development Code also establishes regulations for development and construction within flood prone areas. The Overlays described in Chapter 82.14 are applied to areas of special flood hazard identified by FEMA on flood insurance rate maps and flood boundary maps or the Federal Insurance Administration. Any project proposed in one of these areas is subject to a Flood Hazard Development Review. This review ensures that the proposed Project complies with this Development Code regarding flood protection measures.

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

In addition, the state is in the process of establishing a System Reoperation Task Force comprised of state personnel, federal agency representatives and appropriate stakeholders that will support the update of flood frequency analyses on major rivers and streams and evaluate the need to amend flow objectives (DWR 2008, p. 17-18). Furthermore, in order to coordinate California's water supply and flood management operations, state and federal agencies collaboratively established the Joint Operations Center (JOC) (DWR 2008, p. 18). Year-round the JOC is the focal point for the gathering, analysis, and dissemination of flood and water-related information to stakeholders.

Increase Wildland Fire Hazards

Development in all county areas at risk for wildland fire hazards are required to comply with the 2007 California Fire Code (Title 24, Part 9 of the California Code of Regulations), which requires construction methods that mitigate wildfire exposure be applied in geographical areas where wildfire burning in vegetative fuels may readily transmit fire to buildings and threaten to destroy life, overwhelm fire suppression capabilities, or result in large property losses. The Fire Code establishes minimum standards for materials and material assemblies to provide a reasonable level of exterior wildfire exposure protection for buildings in wildland-urban interface areas and requires the use of ignition-resistant materials and design to resist the intrusion of flame or burning embers projected by a vegetation fire.

General Plan provision S 3.1 Program 7 requires applicants for new land developments, which would include future GHG reduction measures, to prepare a site-specific fire protection plan, with special emphasis in areas of high and very high fire risk. Furthermore, S 3.1 Program 8 requires applicants to fund incremental improvements for the enhancement of local fire protection services.

In addition, General Plan provision S 3.1 Program 9 mandates the implementation fire-prevention measures (such as fuels reduction) to prevent damage to biological habitats in high fire hazard areas such as chaparral areas and similarly, Policy M/S 1.2 encourages the development of fuel breaks adjacent to residential populated areas within the Mountain Region.

CAL FIRE has several programs that support vegetation management and fuel hazard reduction activities (mechanical treatments and prescribed burning). These can be used to increase forest health and resilience to climate impacts (CNRA 2009, p. 114). In recent years, both state and federal fuel reduction priorities have focused on the wildland urban interface (WUI), the area where at-risk forests and rangelands meet structure and human development. In 2001, federal agencies and the Western Governors' Association approved "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment," a 10-year strategy to improve fire suppression, prevention, fuels reduction and recovery, and to restore fire adapted ecosystems through collaboration among states, federal agencies and stakeholders. The plan includes the use of prescribed fire, mechanical treatments and wildland fire use, and seeks to reduce barriers to treatments through policies and incentives (CNRA 2009, p. 115).

As a result CAL FIRE has increased fire suppression readiness to meet changing climate conditions (CNRA 2009, p 115). A year round fire season was established and staffed in southern California, and recommendations from the Governor's Blue Ribbon Commission are being implemented to replace aging fire engines and to provide a higher level of firefighter safety (CNRA 2009, p. 115). Emerging remote sensing technologies are being tested on major fires to provide real time planning tools to incident commanders and fire managers, and new air tanker platforms, including the DC-10, are being evaluated for large and remote fires (CNRA 2009, p. 115). Recent Governor Executive Orders have also provided increased staffing, additional

aircraft availability and other support for periods of critical fuel and weather conditions (CNRA 2009, p. 115).

Alteration of Natural Habitats/Impacts to Biological Resources

The County General Plan and Development Code provisions seek to reduce potential impacts to special-status species and habitats such as forest lands and wetlands. For instance, Chapter 88.01 of the Development Code requires the issuance of a permit prior to the removal of regulated trees and plants, which includes native species, thereby reducing the threat to sensitive plant species or areas of biologically valuable vegetation. Sensitive habitats in the county are able to be protected through stipulations of Chapter 82.11 (Biotic Resources Overlay) of the Development Code, which implements General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats. Biotic Resources Overlays are applied to areas that have been identified by a county, state, or federal agency as habitat for species of unique, rare, threatened, or endangered plants or animals or their habitats as listed in the General Plan.

General Plan Policy M/CO 1.7 encourages conservation and sound management of natural resources in the Mountain Region of the county, including water, streams, and vegetation. CO 2.4 Program 3 states that the County will not permit land conversion until adequate mitigation is provided to reduce biological impacts to less than significant in cases where a Mitigated Negative Declaration is used for CEQA compliance. Additionally, a number of regulatory mechanisms address various types of construction-related impacts to biological habitat. Disturbance within any water of the U.S. would require a Section 404 permit from the U.S. Army Corps of Engineers, which would place certain requirements for avoidance or replacement of lost wetland habitat. When a project would alter the natural flow or bed, channel, or bank of any river, stream, or lake, a Section 1601 streambed alteration agreement would need to be obtained from the California Department of Fish and Game. Like the 404 permit, this agreement would be expected to include measures that alleviate impacts to riparian habitats.

Beginning in 2009, the Department of Fish and Game and California State Parks have made climate change a priority in addressing the complex and large scale challenges needed for conserving biodiversity and habitat (CNRA 2009, p. 56). Both of these Departments are an important part of the climate change solution and are working collaboratively with stakeholders to create strategies for addressing climate change impacts while responding to public needs. Some of these strategies include the development of a system of sustainable habitat reserves. The intent of this strategy is to identify and improve a statewide landscape reserve system to protect the maximum number of representative plant and animal species in California. Another identified strategy proposes the appointment of a permanent team of researchers and land managers to ensure that the best available science is used in management, restoration, and species protection (CNRA 2009, p. 62).

Adaptive approaches to forest regeneration can increase resilience in the short and long-term by adjusting silvicultural practices to establish forests that are more tolerant of future climate conditions. This includes planting genetically appropriate species that will be better adapted to changed climate conditions than the genotypes currently on site. CAL FIRE's L.A. Moran Reforestation Center seedbank catalogues and stores approximately 42,000 pounds of primarily native conifer seeds which are available for replanting forest stands after fires, insect or disease outbreaks, or other catastrophic events (CNRA 2009, p. 115). Its greenhouse facilities have capacity for up to 400,000 container seedlings per year, but have gone unused for seven years due to inadequate funding (CNRA 2009, p. 115). CAL FIRE's Magalia Reforestation Center has the capacity to produce up to 2.5 million bare-root seedlings and 40-50,000 container seedlings

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

per year (CNRA 2009, p. 115). These facilities could be brought back on line relatively quickly and inexpensively if funds for operating and staffing were provided.

Urban forestry has a significant role in adaptation to rising temperature and precipitation runoff events. Increased street tree cover provides shade relief to pedestrians and other residents, absorbs pollutants including ozone and CO₂ which may increase with climate change, and reduces stormwater pollution and flooding. A ten percent increase in vegetation cover can reduce ambient temperatures by 1 to 2 degrees (CNRA 2009, p. 115). Urban forests also provide significant co-benefits, reducing habitat fragmentation and mitigating GHG emissions through sequestration and by reducing energy use for buildings (CNRA 2009, p. 115). CAL FIRE urban forestry activities, funded through state bonds authorized under Propositions 40 and 84, help plant trees and support local agencies and non-profits in planning, implementing and monitoring urban forestry programs (CNRA 2009, p. 115). CAL FIRE helped develop urban forestry carbon protocols to provide incentives for increased urban forest development, and will continue to work with local and federal agencies, private and non-profit sector to expand and enhance urban forests.

Adverse Impacts on Agricultural Resources

The County General Plan includes policies and programs that address potential impacts to agricultural lands. For instance, Policy CO 6.3 states that preservation of prime and statewide important soils types, as well as areas exhibiting viable agricultural operations, will be considered an integral portion of the Open Space Element when reviewing development proposals. Associated CO 6.3 Program 2 states that in the case of commercially viable agricultural areas, land uses that are compatible with agriculture and maintain a list of compatible uses allowed within agricultural preserves are preferable. In addition, Chapter 82.08 of the Development Code provides for the creation of agricultural preserves in certain areas of the county as defined in the California Land Conservation Act of 1965 (Williamson Act).

Furthermore, the California Department of Food and Agriculture (CDFA) and California Department of Conservation (DOC) are developing strategies to address impacts to state agricultural resources resulting from climate change. Some of these strategies include the support of research and development for more drought-tolerant cultivars, crop rotations, and crop mixtures, increased vigilance and development of a long-term funding strategy at the state's port-of-entry inspection stations to prevent entry of new diseases, pests and weeds, and the encouragement of crop diversification among farming operations (CNRA 2009, p. 101-105).

Adverse Impact to Public Health

As mentioned above, public health could be adversely affected by a shifting climate. The Public Health Climate Change Adaptation Work Group (PHCCAWG), in concert with the Department of Public Health (CDPH), has identified several priorities for public health adaptation for climate change (CNRA 2009, p. 40). One of these identified priorities include the increase ground cover and shading by expanding urban forests, community gardens, parks, and native vegetation-covered, as well as open spaces in order to reduce urban heat islands, which are prone to develop when high ratios of paving material exist compared with natural ground cover. Another priority involves the improvement of disease reporting, management and surveillance by replacing the current paper based system with a secure electronic system, The Center for Disease Control (CDC) is exploring ways to develop rapid surveillance by coordinating with larger entities such as the Regional Health information Organizations (RHIOs) and Health Information Exchanges (HIE) (CNRA 2009, p. 42).

3.11 CLIMATE CHANGE AND GREENHOUSE GASES

Based on consideration of the cited General Plan policy provisions, as well as the extensive state-wide strategies and efforts cited above which address and seek to address the environmental effects of climate change such as impacts, it is reasonably expected that the environmental effects of global climate change on the County would not result in a substantial increase in severity of a significant impact identified in the General Plan EIR or cause a new impact. **Thus, there is no new or substantially more severe significant impact.**

4.0 ALTERNATIVES

4.1 INTRODUCTION TO THE ALTERNATIVES ANALYSIS

California Environmental Quality Act (CEQA) Guidelines Section 15126.6(a) states that an environmental impact report (EIR) shall describe and analyze a range of reasonable alternatives to a project. These alternatives should feasibly attain most of the basic objectives of the project, while avoiding or substantially lessening one or more of the significant environmental impacts of the project. An EIR need not consider every conceivable alternative to a project, nor is it required to consider alternatives that are infeasible. The discussion of alternatives shall focus on those which are capable of avoiding or substantially lessening any significant effects of the project, even if they impede the attainment of the project objectives to some degree or would be more costly [CEQA Guidelines Section 15126.6(b)].

When addressing feasibility, CEQA Guidelines Section 15126.6 states that “among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, jurisdictional boundaries, and whether the applicant can reasonably acquire, control or otherwise have access to alternative sites.” The CEQA Guidelines also specify that the alternatives discussion should not be remote or speculative; however, they need not be presented in the same level of detail as the assessment of the proposed project.

CEQA Guidelines indicate that several factors need to be considered in determining the range of alternatives to be analyzed in an EIR and the level of analytical detail that should be provided for each alternative. These factors include (1) the nature of the significant impacts of the proposed project; (2) the ability of alternatives to avoid or lessen the significant impacts associated with the project; (3) the ability of the alternatives to meet the objectives of the project; and (4) the feasibility of the alternatives. These factors would be unique for each project.

Given that the proposed General Plan Amendment is a modification to the County General Plan, this EIR is being prepared pursuant to CEQA Guidelines 15162 and 15163 governing subsequent and supplemental EIRs that are prepared when there is a change to a project for which an EIR has already been prepared. CEQA Guideline 15163 sets forth the requirements for a Supplemental EIR such as this EIR. Generally, a supplemental EIR is only required to contain the information necessary to make the original EIR adequate for the project as revised. Based on these provisions, the supplemental alternatives analysis in this SEIR has been prepared with the following approach.

ALTERNATIVES ANALYSIS APPROACH PROVIDED IN THIS DRAFT SEIR

The alternatives analysis provided below is divided into separate analyses.

- Section 4.2 (Overview of the Alternatives Analysis in the General Plan EIR) evaluates whether changes to the General Plan and its implementation (associated with the proposed project) would alter the conclusions of the previous General Plan EIR alternatives analysis.
- Section 4.3 (Supplemental EIR Alternatives Addressing Project Impacts) evaluates alternatives specifically associated with the implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment in order to avoid or substantially lessen the increased severity of significant and unavoidable environmental effects identified.

4.0 ALTERNATIVES

4.2 OVERVIEW OF THE ALTERNATIVES ANALYSIS IN THE GENERAL PLAN EIR

INTRODUCTION

The San Bernardino County General Plan Program EIR (General Plan EIR) evaluated three alternatives to the General Plan Update consisting of the No Project Alternative, Reduced Development Alternative, and Future Growth in Cities Sphere-of-Influence Alternative [(see San Bernardino County General Plan Program Draft EIR pages V-1 through V-6 (San Bernardino County 2006)]. The Facts, Findings, and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (March 13, 2007) identified that none of the alternatives evaluated in the General Plan EIR were infeasible due to economic, social, and other considerations (San Bernardino County 2007c, pp. 27 and 28). Since the County made these alternative findings in 2007, the following conditions have changed in the county that has some association with these alternatives:

- Economic and development conditions in the county as well as the state have substantially slowed from the recession in 2008 and 2009. While this condition could support the notion that the Reduced Development Alternative may be more appropriate than the 2007 General Plan, the growth projected associated with the General Plan is still expected to eventually occur and does not warrant the reconsideration of this alternative associated with the proposed project.
- Senate Bill (SB) 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). This legislation and the associated implementation of smart growth associated with a future SCS (to be developed by the Southern California Association of Governments) has some similarity to the Future Growth in Cities Sphere-of-Influence Alternative. However, implementation of SB 375 has been factored in GHG Plan reduction measures R3T4 and R3T4-INT (Regional Land Use/Transportation Coordination).

ALTERNATIVES

General Plan EIR Alternative No.1 – No Project Alternative

Overview of Alternative

This alternative would retain the 1989 General Plan, as amended, but would not include the community plans developed as part of the proposed project, nor would the County Development Code be updated. This alternative would allow for a population of about 415,000 in County unincorporated territory.

While the 1989 County General Plan was not projected to 2030, as was the 2007 General Plan, the assumption was made that the Southern California Association of Governments (SCAG) trend projection represents the local general plans, including San Bernardino County's General Plan. The overall San Bernardino County projections have been provided by Meyer Mohaddes Associates at a traffic analysis zone (TAZ) level that includes both the incorporated and unincorporated areas of the county. While it makes only a small difference in the overall projections, it should be noted that the SCAG TAZ projections do not include the outlying Desert Planning Area that encompasses the City of Needles. Further, the projections based on the city

general plans were provided by the San Bernardino Associated Governments (SANBAG) and these projections were used to guide the development of the Congestion Management Program (CMP) for the region.

In summary, the No Project Alternative would delay the significant physical environmental effect of the proposed update to the County General Plan [see General Plan EIR (San Bernardino County 2006, pp. V-3 through V-6)], but the anticipated significant effect on air quality, noise, and circulation and traffic would likely occur at a greater pace with about the same magnitude as the county continues to grow under the 1989 General Plan. For this reason, the No Project Alternative is not superior to the 2007 General Plan from an environmental perspective and was determined infeasible in the Facts, Findings, and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update.

Effect of Proposed Project on Alternative Impact Conclusions

If the proposed project were a component of Alternative 1, it would result in increased severity of previously identified significant environmental effects associated with aesthetics, agricultural resources, and biological resources associated with the further promotion of renewable energy generating facilities (GHG Plan reduction measures R3E9 through R3E14). As identified in the General Plan Final EIR Table V-1, the No Project Alternative was identified as having more adverse impacts to aesthetics, agricultural resources, and biological resources than the 2007 General Plan. The inclusion of the proposed project would not alter the alternative feasibility determination made by the County (San Bernardino County 2007c, p. 28).

General Plan EIR Alternative No.2 – Reduced Development Alternative

Overview of Alternative

Under Alternative 2, the County General Plan would only be updated to provide for the growth of the county by 200,000 people, not the approximately 415,000 people that would be accommodated by the 2007 General Plan. General Plan goals and policies would also be updated as they would under the 2007 General Plan. For example, the land use intensities (densities and floor area ratios) of the land use/zoning districts would be reduced, with a corresponding reduction in the maximum population density averages. This alternative would also include the adoption of the 13 community plans prepared as part of the update to the General Plan. The County's Development Code would also be updated as part of this alternative to implement the updated General Plan.

Generally, the impacts created by this alternative would be less than the proposed update of the 2007 General Plan since only half the future population would be accommodated in the county through this alternative.

In summary, when comparing the significant effects of the 2007 General Plan to Alternative 2, impacts to agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use, mineral resources, noise, population and housing, public services and utilities, recreation, and traffic and circulation are expected to be reduced given the overall reduction in the scale of the growth provided by the 2007 General Plan. Traffic and related impacts would be approximately half of those under the 2007 General Plan. Although these impacts would be less than the impacts from the 2007 General Plan, the traffic increase that would occur with this alternative would still require the installation of traffic improvements throughout the county. Also, the vehicle emissions

4.0 ALTERNATIVES

would still surpass the threshold set by the South Coast Air Quality Management District (SCAQMD) and would still be considered a significant air quality impact, although to a lesser degree than the 2007 General Plan. For the above reasons, the Reduced Development Alternative was identified superior to the 2007 General Plan from an environmental perspective. However, this alternative was determined infeasible in the Facts, Findings, and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update.

Effect of Proposed Project on Alternative Impact Conclusions

If the proposed project were a component of Alternative 2, it would result in an increased severity of previously identified significant environmental effects associated with aesthetics, agricultural resources, and biological resources associated with the further promotion of renewable energy generating facilities (GHG Plan reduction measures R3E9 through R3E14). As identified in the General Plan Final EIR Table V-1, the Reduced Development Alternative was identified as having less adverse impacts to aesthetics, agricultural resources, and biological resources than the 2007 General Plan. However, the inclusion of the proposed project would not alter the feasibility determination made by the County, as this alternative would still be inconsistent with the County's goals and policies set forth in the Economic Development Element and Housing Element (San Bernardino County 2010c, p. 28).

General Plan EIR Alternative No.3 – Future Growth in Cities Sphere-of-Influence Alternative

Overview of Alternative

Under Alternative 3, the County General Plan would be updated to accommodate the growth in the county by approximately 409,000 people. However, all the new growth in the county would only occur within the adopted spheres of influence of the cities in the county. This alternative includes the revision of General Plan goals and policies, although the goals and policies would be somewhat different from the goals and policies included as part of the 2007 General Plan since all new growth in the county would only occur within city spheres of influence. For example, Goals LU-6 and LU-9 and their implementing policies would probably be strengthened to direct virtually all new urban growth into the spheres of influence of existing cities. Similarly, many of the land use goals and policies would need to be rewritten to discourage most, if not all, new urban growth from occurring in the Mountain and Desert regions, unless growth were located within existing spheres of influence. This alternative would also include the community plans developed as part of the 2007 County General Plan. This alternative also includes the update of the County Development Code, as would the 2007 General Plan.

Generally, the impacts created by this alternative would be different from all the other proposed alternatives to the General Plan, since accommodating an additional 409,000 people in the county would only occur within the spheres of influence in the cities in the county, which would greatly increase the building densities in these areas with attendant impacts that would be created by increasing density in an area. This alternative would create greater aesthetic, biological resource, land use, noise, public services and utility, recreation, and transportation and traffic impacts than the 2007 General Plan. For these reasons, the Future Growth in Cities Sphere-of-Influence Alternative was not determined superior to the 2007 General Plan and was determined infeasible in the Facts, Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update.

Effect of Proposed Project on Alternative Impact Conclusions

If the proposed project were a component of Alternative 3, it would result in an increased severity of previously identified significant environmental effects associated with aesthetics, agricultural resources, and biological resources related to the further promotion of renewable energy generating facilities (GHG Plan reduction measures R3E9 through R3E14). As identified in the General Plan Final EIR Table V-1, the Future Growth in Cities Sphere-of-Influence Alternative was identified as having more adverse impacts to aesthetics and biological resources than the 2007 General Plan. The inclusion of the proposed project would not alter the feasibility determination made by the County, as this alternative would still create substantially more environmental impacts than the 2007 General Plan (San Bernardino County 2010c, p. 28).

4.3 SUPPLEMENTAL EIR ALTERNATIVES ADDRESSING PROJECT IMPACTS

INTRODUCTION

As discussed in Section 2.0, to fulfill the purposes of the proposed project, the County has identified the following objectives:

- Adopt a GHG emissions reduction goal to reduce emissions from activities over which the county has jurisdictional and operational control, consistent with the target reductions of Assembly Bill (AB) 32 and the AB 32 scoping plan;
- Provide estimated GHG reductions associated with the county's existing sustainability efforts and integrate the county's sustainability efforts into the discrete actions of the GHG plan;
- Provide a list of discrete actions that will aggressively reduce GHG emissions; and,
- Approve a GHG plan that satisfies the requirements of section 15183.5 of the CEQA guidelines, so that compliance with the GHG plan can be used in appropriate situations to determine the significance of a project's effects relating to greenhouse gas emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG plan.

The impact analysis provided in Sections 3.1 through 3.11 has identified determined the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment would have substantial increase in the following significant and unavoidable impacts that were not anticipated in the General Plan EIR:

- Impacts 3.1.1 – Impacts to Scenic Vista, Scenic Resources, and Routes or Existing Scenic Character
- Impact 3.2.1 – Impacts to Agricultural Resources
- Impact 3.4.1 – Impacts to Native Habitats, Sensitive Species and Wildlife Corridors

As identified in Sections 3.1 (Aesthetics and Visual Resources), 3.2 (Agricultural and Forestry Resources), and 3.4 (Biological Resources), implementation of reduction measures R3E9, R3E10, R3E12, REE13 and R3E14 under the GHG Plan would promote the development of renewable energy generating facilities in the county that would substantially increase the severity of significant aesthetic, agricultural and biological resource impacts identified in the General Plan

4.0 ALTERNATIVES

EIR and the Facts, Findings, and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings).

The following two alternatives were identified to address the above identified impacts.

- SEIR Alternative No. 1 - No Project Alternative
- SEIR Alternative No. 2 - Renewable Energy Generating Facility Restriction Alternative

SEIR ALTERNATIVE NO. 1 - NO PROJECT ALTERNATIVE

Under this alternative, the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code is not adopted and the General Plan and Development Code would remain as they are currently adopted. This alternative is consistent with CEQA Guidelines 15126.6(e) (3) (A).

Environmental Analysis

Aesthetics and Visual Resources

As identified in Section 3.1 (Aesthetics and Visual Resources), the proposed project would result in a substantial increase in the severity of impact associated with scenic vista, scenic resources, and routes or existing scenic character, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase by the proposed project is a significant and unavoidable impact of the proposed project. Alternative 1 would retain the existing General Plan and Development Code and would not result in an increase in severity of this impact beyond what was identified in the General Plan EIR and General Plan CEQA Findings.

Agricultural and Forestry Resources

As identified in Section 3.2 (Agricultural and Forestry Resources) the proposed project would substantially increase the severity of impacts to agricultural resources, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed project. Alternative 1 would retain the existing General Plan and Development Code and would not result in an increase in severity of this impact beyond what was identified in the General Plan EIR and General Plan CEQA Findings.

Biological Resources

As identified in Section 3.4 (Biological Resources) the proposed project would result in a substantial increase of the severity of impact associated with sensitive species and wildlife corridors, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed project. Alternative 1 would retain the existing General Plan and Development Code and would not result in an increase in severity of this impact beyond what was identified in the General Plan EIR and General Plan CEQA Findings.

Climate Change and Greenhouse Gases

As identified in Section 3.11 (Climate Change), implementation of the proposed project would implement a number of County activities that are consistent with reduction target of AB 32 and reduction strategies which are consistent with the early emission reduction strategies contained in the AB 32 Scoping Plan Report. No significant greenhouse gas or climate change impacts were identified for the proposed project. Alternative 1 would not include the GHG Plan and the associated greenhouse gas reduction measures and would hinder the county's ability in attaining consistency with AB 32 for all activities under the County's jurisdiction. Thus, Alternative would result in a more severe impact to climate change and greenhouse gas emission reductions as compared to the proposed project.

SEIR ALTERNATIVE NO. 2 – RENEWABLE ENERGY GENERATING FACILITY RESTRICTION ALTERNATIVE

Alternative 2 is similar to the proposed project and would implement the reduction measures that are proposed in the General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment. In order to address the impacts associated with the proposed project, Alternative 2 would include additional Development Code amendments by adding the following standards for the development of renewable energy generating facilities to Chapter 84.29 (Renewable Energy Generating Facilities) of the Development Code:

- Prohibit the placement of wind and solar facilities and associated supporting facilities (including transmission lines) on or within County designated scenic routes or state scenic highways, County open space areas and regional parks or other scenic resources recognized by federal, state and local jurisdictions that could be adversely impacted by facilities located on land under County jurisdiction.
- Prohibit the placement of facilities and supporting facilities on farmland designated as important farmland (prime, statewide, unique), by the California Department of Conservation, Farmland Mapping and Monitoring Program (FMMP).
- Avoid siting large scale renewable energy facilities in important wildlife movement corridors, breeding areas or migration routes of any listed state or federal species or state species of concern.

These development restrictions would occur only on property that is under County jurisdiction, and would not apply to property that is under State or Federal jurisdiction.

Environmental Analysis

Aesthetics and Visual Resources

As identified in Section 3.1 (Aesthetics and Visual Resources), the proposed project would result in a substantial increase in the severity of impact associated with scenic vista, scenic resources, and routes or existing scenic character, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed project. Alternative 2 would reduce these impacts by providing additional development standards in the Development Code that would restrict renewable energy generating facilities in areas that are considered a scenic vista, a scenic resource, and routes or existing scenic character. Thus, this alternative would substantially reduce the increase severity of this impact as compared to the proposed project,

4.0 ALTERNATIVES

Agricultural and Forestry Resources

As identified in Section 3.2 (Agricultural Resources) the proposed project would substantially increase the severity of impacts to agricultural resources, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed project. Alternative 2 would avoid this impact by prohibiting the placement of facilities and supporting facilities designated important farmland (prime, statewide, unique), by the California Department of Conservation, Farmland Mapping and Monitoring Program (FMMP). Thus, this alternative would substantially reduce the increase severity of this impact as compared to the proposed project.

Biological Resources

As identified in Section 3.4 (Biological Resources) the proposed project would result in a substantial increase of the severity of impact associated with sensitive species and wildlife corridors, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed project. Alternative 2 would include development standards that would require demonstration of no adverse impact to listed state or federal species or species of concern. This alternative would substantially reduce the increase severity of this impact as compared to the proposed project.

Climate Change and Greenhouse Gases

As identified in Section 3.11 (Climate Change), implementation of the proposed project would implement a number of County activities that are consistent with reduction target of AB 32 and reduction strategies which are consistent with the early emission reduction strategies contained in the AB 32 Scoping Plan Report. No significant greenhouse gas or climate change impacts were identified for the proposed project. Alternative 2 would implement the same types of reduction measures and would thus also avoid significant impacts to climate change. While Alternative 2 would provide amendments to the Development Code which would restrict the development of renewable energy generating facilities, such facilities are classified as "R3" reduction measures and were not used to demonstrate achievement in meeting the County's 2020 GHG emission reduction target given their uncertainty.

4.4 ALTERNATIVE COMPARISON

Table 4.0-1 provides a summary of the potential impacts of the SEIR alternatives evaluated in this section, as compared with the potential impacts of the proposed General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan) and associated Development Code Amendment. The impact significance is identified for the No Project Alternative and the Renewable Energy Generating Facility Restriction Alternative as well as the ranking of the impact as compared to the proposed project. A "B" ranking means that the alternative would be "better" or would have less of an environmental impact than the proposed project, while a "W" ranking means the alternative would result in a "worse" impact. The "S" ranking identifies where the alternative has a "similar" impact as the proposed project. Based upon the evaluation described in this section, Alternative 2 would be the environmentally superior alternative. It should also be noted that Alternative 1 would not meet any of the project objectives.

**TABLE 4.0-1
SUMMARY COMPARISON OF ALTERNATIVES**

Environmental Impacts	Proposed Project	Alternative 1	Alternative 2
<i>Aesthetics</i>			
Scenic Vistas, Scenic Resources, and routes or existing character	Substantial Increase in a Significant and Unavoidable Impact	No Substantial Increase in a Significant and Unavoidable Impact	No Substantial Increase in a Significant and Unavoidable Impact
Ranking		B	B
<i>Agricultural Resources</i>			
Conversion of Important Farmland Under Project and Cumulative Conditions.	Substantial Increase in a Significant and Unavoidable Impact	No Substantial Increase in a Significant and Unavoidable Impact	No Substantial Increase in a Significant and Unavoidable Impact
Ranking		B	B
<i>Biological Resources</i>			
Increase of severity associated with impacts to sensitive species and wildlife corridors	Substantial Increase in a Significant and Unavoidable Impact	No Substantial Increase in a Significant and Unavoidable Impact	No Substantial Increase in a Significant and Unavoidable Impact
Ranking		B	B
<i>Climate Change</i>			
Consistency with AB 32 and the AB 32 Scoping Plan	No New or Substantially more Severe Significant Impact	New or Substantially more Severe Significant Impact	No New or Substantially more Severe Significant Impact
Ranking		W	S

Notes:

B: Alternative would result in better conditions than the proposed project.

S: Alternative would result in similar conditions as the proposed project.

W: Alternative would result in worse impacts than the proposed project.

Environmentally Superior Alternative

While Alternative 2 would provide benefits associated with physical environmental impacts, the proposed project is environmentally superior in terms of reducing overall GHG emissions in the County and fulfilling the objectives of the 2007 General Plan.

5.0 OTHER CEQA ANALYSIS

This chapter summarizes any changes in conclusions from the San Bernardino County General Plan EIR (General Plan EIR) associated with the proposed San Bernardino General Plan Amendment, Greenhouse Gas Reduction Plan (GHG Plan), and associated Development Code Amendment (referred to collectively hereafter as the proposed Project). These potential changes concern cumulative impacts, significant unavoidable impacts, growth-inducing effects, and impacts found not to be significant.

The purpose of this Draft SEIR is to satisfy California Environmental Quality Act (CEQA) requirements by addressing the environmental effects specific to the implementation of the proposed Project. Because this document is a supplemental EIR, the section addresses the environmental effects of implementing the General Plan Amendment, GHG Plan, and associated Development Code Amendment in light of the previous environmental review in the San Bernardino County General Plan Program EIR (General Plan EIR) as provided for under CEQA Guidelines Sections 15162 and 15163.

5.1 CUMULATIVE IMPACTS

INTRODUCTION

CEQA requires that an environmental impact report (EIR) contain an assessment of the cumulative impacts that could be associated with the proposed Project. According to CEQA Guidelines Section 15130(a), "an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable." *Cumulatively considerable* means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (as defined by Section 15130). As defined in CEQA Guidelines Section 15355, a cumulative impact is an impact created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. A cumulative impact occurs from:

... 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 future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

In addition, Section 15130(b) identifies the following elements as necessary for an adequate cumulative impact analysis:

- 1) *Either:*
 - (A) *A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or,*
 - (B) *A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.*

5.0 OTHER CEQA ANALYSIS

- 2) *A definition of the geographic scope of the area affected by the cumulative effect and a reasonable explanation for the geographic limitation used;*
- 3) *A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and*
- 4) *A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.*

Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

Approach to the Cumulative Impact Analysis

The General Plan EIR provides an analysis of cumulative impacts resulting from implementation of the General Plan [see General Plan Final EIR (San Bernardino County 2006, pp. VI-1 through VI-5)]. The Draft SEIR utilizes this previous cumulative impact analysis to determine whether the proposed Project would result in new significant (cumulatively considerable) impacts or a substantial increase in severity of cumulative impacts previously identified in the General Plan EIR.

Aesthetic and Visual Resources

Impact 5.1

The General Plan EIR found that cumulative impacts to scenic resources would not be considerable with implementation of the General Plan. Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would further contribute to the alteration of the visual character of the region, impacts to scenic vistas, and increased glare/lighting. Subsequent implementation of GHG Plan reduction measures that provide for renewable energy generating facilities would result in an increased severity of scenic impacts beyond what was considered in the General Plan EIR. **Thus, the proposed Project would substantially increase the severity of this cumulative impact, which was previously identified in the General Plan EIR as not a considerable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

The General Plan EIR found that impacts to visual resources were not considerable. However, as determined in SEIR Section 3.1, Aesthetics and Visual Resources, implementation of GHG Plan reduction measures that would further promote renewable energy generating facilities (R3E9 through R3E14), in combination with other future development in the region under the General Plan, has the potential to cumulatively degrade the county's visual resources such as views to scenic vistas and scenic highways, degrading the general visual character of the region, and lighting associated with new projects or improvement projects adding to glare. Although impacts to scenic resources resulting from the development of GHG reduction measures would be addressed on a case-by-case project-level basis and the policies and programs of the General Plan, combined with mitigation measure MM 3.1.3 and adherence to County Code Chapter 83.07 would reduce the impacts from daytime glare and nighttime lighting, the

proposed Project would not restrict the placement of wind generators along hillsides and ridgelines (which are visually prominent locations and can substantially alter the landscape characteristics of areas of the county). Thus, cumulative visual impacts from the further promotion of renewable energy generating facilities would have a substantial increased severity of impacts to county scenic resources associated with the proposed Project. **Thus, the proposed Project results in a substantial increase in the severity of this impact, such that the overall cumulative impact is now significant and unavoidable. This substantial increase that would result from the proposed Project is a new significant and unavoidable cumulative impact.**

Agricultural Resources

Impact 5.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable cumulative impacts to agricultural resources that cannot be fully mitigated to a level below significance. Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would result in a contribution to the loss of agricultural uses. **Thus, implementation of the proposed Project would result in a substantial increase in the severity of this cumulative impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

As identified in Section 3.2, Agricultural and Forestry Resources, implementation of GHG reduction measures involving the further promotion of renewable energy generating facilities (R3E9 through R3E14), in combination with other future development in the region under the General Plan, has the potential to create land use conflicts and/or convert agricultural lands. Wind and solar generating facilities are allowed in the Agriculture and Resource Conservation zone districts as provided in the Development Code under Chapter 84.29. It is anticipated that potential impacts would be addressed on a case-by-case project-level basis through implementation of the provided mitigation measures and compliance with cited General Plan policies and programs. With the incorporation of these measures, cumulative impacts would be reduced. However, the incremental contribution to cumulative impacts on agricultural resources is considered to increase the severity of a cumulatively considerable impact identified in the General Plan EIR. **Thus, the proposed Project results in a substantial increase in the severity of this impact. This substantial increase that would result from the proposed Project is a new significant and unavoidable impact.**

Biological Resources

Impact 5.3 The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, cumulative impacts to biological resources from implementation of the General Plan cannot be fully mitigated to a level below significance. The proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would result in an increase in severity of cumulative biological resource impacts identified in the General Plan EIR. **Thus, implementation of the proposed Project would result in a substantial increase in the severity of this cumulative impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This**

5.0 OTHER CEQA ANALYSIS

substantial increase is a significant and unavoidable impact of the proposed Project.

As identified in Impact 3.4.1 in Section 3.4, Biological Resources, implementation of GHG Plan reduction measures R3E9 through R3E14 could involve the further promotion of wind generators and other renewable energy facilities that have the potential to impact sensitive and special-status species in unique ways compared with other development not anticipated or evaluated in the General Plan EIR. Mitigation measures MM 3.4.1a and MM 3.4.1b would mitigate project-specific biological resource impacts. However, the proposed Project would still increase cumulative biological resource impacts beyond what was anticipated in the General Plan EIR. **Thus, the proposed Project results in a substantial increase in the severity of this impact. This substantial increase that would result from the proposed Project is a new significant and unavoidable impact.**

5.2 EFFECTS FOUND NOT TO BE CUMULATIVELY SIGNIFICANT

There are no new or substantially more severe impacts anticipated from air quality, cultural and paleontological resources, hazards and hazardous materials, hydrology and water quality, noise, public services and utilities, transportation and circulation, and climate change and greenhouse gases as a result of the proposed project. Therefore, there would be no cumulatively significant impacts related to these areas.

5.3 SIGNIFICANT UNAVOIDABLE IMPACTS

The Findings and Statement of Overriding Considerations Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update (General Plan CEQA Findings) identified the following six resource areas that would have significant unavoidable impacts if the General Plan were implemented. The County adopted a Statement of Overriding Considerations in order to adopt the General Plan EIR (San Bernardino County 2007c, pp. 28 through 31).

- Aesthetic Impacts AES-1, 2, and 3 – Significant impacts on aesthetics, views and scenic resources may occur due to the increased growth and development projected during the build-out of the General Plan Update.
- Agricultural Impacts AG-1 and 2 – Implementation of the General Plan Update will result in the decline of agricultural uses within the County due to urban expansion and economic considerations.
- Air Quality Impacts AQ-1, 2, and 3 – Growth anticipated under the updated General Plan will result in construction of new roads and infrastructure and increased urbanization of agricultural lands, resulting in higher air emissions.
- Biological Resource Impacts BIO-1, 2, 3, 8, 9, 13, 14, and 16 – Implementation of the General Plan Update will have impacts on candidate, sensitive or special status plant and animal species in certain regions; movement of native resident or migratory fish or wildlife species in certain regions; federally protected wetlands in certain regions; and riparian habitat or other sensitive natural communities in all regions.
- Hazards and Hazardous Materials Impacts HAZ-5 and 6 – New development in high fire hazard areas will be subject to periodic wild fires that could destroy structures and subject people occupying those structures to injury or death.

- Transportation and Traffic Impacts TR-2 and 3 – Implementation of the General Plan Update will result in increased traffic and reduced levels of service on roads and at intersections within the County.

This Draft SEIR identified that the proposed Project would result in an increased severity in the following project significant and unavoidable impacts identified in the General Plan EIR:

- Aesthetic Impacts AES-1, 2, and 3 – Significant impacts on aesthetics, views and scenic resources may occur due to the increased growth and development projected during the build-out of the General Plan Update. Draft SEIR Impact 3.1.1 identifies an increased severity of these General Plan EIR significant and unavoidable impacts.
- Agricultural Impacts AG-1 and 2 – Implementation of the General Plan Update will result in the decline of agricultural uses within the County due to urban expansion and economic considerations. Draft SEIR Impact 3.2.1 identifies an increased severity of these General Plan EIR significant and unavoidable impacts.
- Biological Resource Impacts BIO-1, 2, 3, 8, 9, 13, 14, and 16 – Implementation of the General Plan Update will have impacts on candidate, sensitive or special status plant and animal species in certain regions; movement of native resident or migratory fish or wildlife species in certain regions; federally protected wetlands in certain regions; and riparian habitat or other sensitive natural communities in all regions. Draft SEIR Impact 3.4.1 identifies an increased severity of these General Plan EIR significant and unavoidable impacts.

The General Plan CEQA Findings identified the following cumulatively considerable impacts that are significant and unavoidable from implementation of the General Plan (San Bernardino County 2007c, pp. 25 and 26):

Loss of Productive Agricultural Resources. Implementation of the updated General Plan over its 25-year planning horizon will result in a loss of agricultural land currently producing food and fiber, as well as land currently occupied by dairies. Continued urban expansion, primarily in the Valley Region where the bulk of the population currently resides, is resulting in conversion of agricultural uses due to economic pressures. The loss of agriculture land caused by the update to the General Plan will create significant and unavoidable cumulative impacts.

Degradation of Air Quality. The General Plan Update and future development pursuant to the Plan will add incrementally to the degradation of air quality due primarily to an increase in the number of vehicle trips and miles traveled as a result of increasing population in the County. The General Plan Update identified a number of measures to reduce travel-related emissions, including carpooling, improved public transit and incentives for the use of low-emission vehicles. One of the objectives of the updated Plan is to create a number of industrial and commercial jobs that will allow local residents to live near their homes and thus discontinue driving long distances. Although these measures will result in positive air quality effects, they will not offset the effects caused by increased population. Therefore, the cumulative impacts to air quality would remain significant and unavoidable due to overall growth in the region.

Loss of Biological Resources. The expected increase in population addressed in the General Plan is considered to cause a significant and unmitigated irreversible impact to biological resources, due primarily to unrestricted growth and urban sprawl. Because the

5.0 OTHER CEQA ANALYSIS

increase in population will result in the loss of resources and habitat that currently support native plants and animals within the County and in areas that provide the County with resources such as water, electricity and fuel, the General Plan Update will result in significant and unavoidable cumulative impacts.

Increased Transportation/Traffic. Future development in accordance with the General Plan Update will contribute to present and projected adverse traffic congestion on urban and arterial streets. Virtually all freeways serving the County will operate at unacceptable levels of service ("LOS"). Although mitigation measures will reduce certain of these impacts to a less-than-significant level, there are no mitigation measures available to reduce other impacts, such as impacts to roadways not within the County's jurisdiction, to below a level of significance. Therefore, the update to the General Plan will result in significant and unavoidable cumulative impacts.

This Draft SEIR identified that the proposed Project would result in an increased severity in the following cumulatively impacts identified in the General Plan EIR:

Impact 5.1 The General Plan EIR found that cumulative impacts to scenic resources would not be considerable with implementation of the General Plan. Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would further contribute to the alteration of the visual character of the region, impacts to scenic vistas, and increased glare/lighting. Subsequent implementation of GHG Plan reduction measures that provide for renewable energy generating facilities would result in an increased severity of scenic impacts beyond what was considered in the General Plan EIR. **Thus, the proposed Project would substantially increase the severity of this cumulative impact, which was previously identified in the General Plan EIR as not a considerable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

Impact 5.2 The General Plan EIR and the General Plan CEQA Findings determined that implementation of the General Plan would result in significant and unavoidable cumulative impacts to agricultural resources that cannot be fully mitigated to a level below significance. Implementation of the proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would result in a contribution to the loss of agricultural uses. **Thus, implementation of the proposed Project would result in a substantial increase in the severity of this cumulative impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

Impact 5.3 The General Plan EIR and the General Plan CEQA Findings found that despite the imposition of certain mitigation measures, cumulative impacts to biological resources from implementation of the General Plan cannot be fully mitigated to a level below significance. The proposed General Plan Amendment, GHG Plan, and associated Development Code Amendment, in combination with anticipated cumulative impacts identified from implementation of the General Plan, would result in an increase in severity of

cumulative biological resource impacts identified in the General Plan EIR. **Thus, implementation of the proposed Project would result in a substantial increase in the severity of this cumulative impact, which was previously identified in the General Plan EIR as a significant and unavoidable impact. This substantial increase is a significant and unavoidable impact of the proposed Project.**

5.4 GROWTH-INDUCING IMPACTS

Growth-inducing effects of the proposed General Plan Update were fully analyzed in the General Plan EIR. The General Plan EIR found that based on population forecasts approved by the Southern California Association of Governments (SCAG), the population will increase by a maximum of 436,500 by the year 2030. In addition, the update to the San Bernardino County General Plan will increase the amount of economic activity resulting from the direction and strategies within the county. The General Plan EIR concluded that the update to the San Bernardino County General Plan will be growth-inducing, but the growth will be consistent with the regional growth forecasts adopted by SCAG (San Bernardino County 2006, p. VII-2).

Implementation of the proposed Project, amending the General Plan to include a GHG Emission Reduction Plan and associated Development Code Amendments, would alter growth potential of the General Plan as evaluated in the General Plan EIR. Therefore, the revisions to the project studied in this SEIR do not change the conclusions regarding growth inducement. Moreover, the proposed Project seeks to promote sustainable communities through energy efficiency and renewable energy strategies, green building strategies, employment-based trip and vehicle miles traveled reductions policy, and bicycle/pedestrian infrastructure and promotion.

5.5 EFFECTS FOUND NOT TO BE SIGNIFICANT

CEQA Guidelines Section 15128 requires an EIR to briefly describe any possible significant effects that were determined not to be significant and were, therefore, not discussed in detail in the EIR. For purposes of this Draft SEIR, the following topics were eliminated from further evaluation in the scoping phase of the supplemental environmental analysis because the revisions to the Project or changed conditions would not have a substantial effect on these resources: geology and soils, land use/planning, mineral resources, population/housing, and recreation. Impacts to air quality, cultural and paleontological resources, hazards and hazardous materials, hydrology and water quality, noise, public services and utilities, transportation and traffic, and greenhouse gases and climate change were fully analyzed in this Draft SEIR and were determined to be less than significant; these impacts are disclosed in Section 3.1 through 3.11 of this Draft SEIR.

5.6 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

INTRODUCTION

Public Resources Code Section 21100(b)(2), a part of CEQA, requires that EIRs prepared for the adoption of plan, policy, or ordinance of a public agency must include a discussion of significant irreversible environmental changes of project implementation. In addition, CEQA Guidelines Section 15126.2(c) describes irreversible environmental changes as follows:

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,

5.0 OTHER CEQA ANALYSIS

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. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Significant irreversible environmental changes of the General Plan were fully analyzed in Section IV of the General Plan EIR. The General Plan EIR identified the unavoidable significant effects caused by implementation of the General Plan. The General Plan EIR identified significant unavoidable impacts related to aesthetics, agricultural resources, air quality, biological resources, hazards and hazardous materials, and traffic and circulation. As identified in this Draft SEIR, the proposed Project would increase the severity of some of these significant irreversible environmental changes associated with increased aesthetic impacts (see Impact 3.1.1 in Section 3.1, Aesthetics and Visual Resources) and loss of agricultural uses (see Impact 3.2.1 in Section 3.2, Agricultural and Forestry Resources).

6.0 REFERENCES

- Bureau of Land Management and California Energy Commission (BLM/CEC). 2010. *Calico Solar Project Staff Assessment and Draft Environmental Impact Statement*.
- Bureau of Land Management and San Bernardino County (BLM/County). 2010. *Draft Environmental Impact Statement/Environmental Impact Report for the Granite Mountain Wind Energy Project DES 10-11*.
- California Air Resources Board. 2008. *Functional Equivalent Document for the Climate Change Scoping Plan*. <http://www.arb.ca.gov/cc/scopingplan/document/appendix3.pdf> (accessed December 9, 2010).
- . 2010a. *Air Quality Data Statistics*. <http://www.arb.ca.gov/adam/> (accessed December 2010).
- . 2010b. *Ambient Air Quality Standards*. <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf> (accessed December 2010).
- . 2010c. *Area Designation Maps/State and National*. <http://www.arb.ca.gov/desig/adm/adm.htm> (accessed December 2010).
- . 2010d. *Functional Equivalent Document for California Cap on GHG Emissions and Market-Based Compliance Mechanisms*. <http://www.arb.ca.gov/regact/2010/capandtrade10/capisor.pdf> (accessed December 9, 2010).
- . 2010e. *Functional Equivalent Document for Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375* (September 2010, SCH# 201008102). http://arb.ca.gov/cc/sb375/fed_sb375_080910.pdf (accessed December 9, 2010).
- . 2010f. *Functional Equivalent Document for Renewable Electricity Standard*. <http://www.arb.ca.gov/regact/2010/res2010/res10e.pdf> (accessed December 9, 2010).
- California Building Standards Commission (CBSC). 2007. *2007 California Building Code*. Effective January 1, 2008.
- California Department of Conservation (DOC). 2009. *San Bernardino County 2006–2008 Land Conversion*.
- California Department of Conservation (DOC), Farmland Mapping and Monitoring Program. 1994. *A Guide to the Farmland Mapping and Monitoring Program*. Sacramento, CA.
- California Department of Forestry and Fire Protection (Cal-Fire). 1999. *Northeast Information Center*. <http://www.indiana.edu/~e472/cdf/northeast.shtml> (accessed December 15, 2010).
- California Department of Toxic Substances Control (DTSC). 2010a. <http://www.dtsc.ca.gov/>.
- . 2010b. *EnviroStor*. <http://www.epa.gov/enviro/> (accessed December 2010).
- California Department of Transportation (Caltrans). 2002a. *California Airport Land Use Planning Handbook*.
- . 2002b. *Transportation Related Earthborne Vibrations*.

6.0 REFERENCES

- . 2007. *California Scenic Highway Program*. <http://www.dot.ca.gov/hq/LandArch/scenic/scpr.htm>.
- California Department of Water Resources (DWR). 2003. *California's Groundwater*. <http://www.water.ca.gov/groundwater/bulletin118/bulletin118update2003.cfm> (accessed December 2010).
- . 2009a. *California Water Plan Highlights, Integrated Water Management, Update 2009, Department of Water Resources, Public Review Draft*.
- . 2009b. *California Water Plan Update 2009, Working Draft, Volume 3 Regional Reports*. <http://www.waterplan.water.ca.gov/cwpu2009/index.cfm#volume1> (accessed December 2010).
- . 2009c. *Groundwater*. <http://www.groundwater.water.ca.gov/>.
- California Energy Commission (CEC). 2005. *California Solar Resources – In Support of the 2005 Integrated Energy Policy Report*.
- . 2008. California Energy Commission's California Wind Resource Potential Map. http://www.energy.ca.gov/maps/wind_potential.html (accessed January 2010).
- . 2009. *Beacon Solar Energy Project Environmental Assessment*.
- California Environmental Protection Agency (CalEPA). 2010. <http://www.calepa.ca.gov/cupa/> (accessed December 2010).
- California Governor's Office of Planning and Research (OPR). 2003. *State of California General Plan Guidelines*. 4.8 noise
- California State Water Resources Control Board (SWRCB). 2009. <http://www.swrcb.ca.gov/>.
- California Urban Water Conservation Council (CUWCC). 2009. <http://www.cuwcc.org/default.aspx>.
- California Air Pollution Control Officers (CAPCOA). 2010. *Quantifying Greenhouse Gas Mitigation Measures*. August 2010.
- California Air Resources Board (CARB). 2009. *Final Regulation Order: Regulation to Reduce GHG Emissions from Simi-conductor Operations*.
- California Air Resources Board (CARB). 2004. *Climate Change Emissions Control Regulations*.
- California Climate Action Registry. 2009. *California Climate Action Registry General Reporting Protocol Version 3.1*. January 2009.
- California Department of Water Resources (DWR). 2010. *The State Water Project Delivery Reliability Report 2009*. August 2010.
- California Department of Water Resources (DWR). 2008. *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. October 2008.

- California Energy Commission (CEC), California Environmental Protection Agency (CalEPA), and California Department of Water Resources (DWR). 2009. *Using Future Climate Projections to Support Water Resources Decision Making in California*. April 2009.
- California Energy Commission (CEC). 2008. *Building Energy Efficiency Standards for Residential and Nonresidential Buildings*. <http://www.energy.ca.gov/title24/>
- California Energy Commission (CEC). 2006. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (CEC-600-2006-013)*.
- California Natural Resources Agency (CNRA). 2009. *2009 California Climate Adaptation Strategy*. 2009.
- CEOs for Cities (CFCs). 2010. *New York City's Green Divide*. April 2010. http://www.nyc.gov/html/dot/downloads/pdf/nyc_greendividend_april2010.pdf
- European Fluorocarbons Technical Committee (EFCTC). 2003. *Fluorocarbons and Sulphur Hexafluoride: Perfluorocarbons (PFCs) Fact Sheet*. http://www.fluorocarbons.org/en/info/brochures/fact_10.html
- Federal Highway Administration (FHWA). 2006. *Roadway Construction Noise Model*.
- Intergovernmental Panel on Climate Change (IPCC). 2007. *IPCC Fourth Assessment Report*. 2007
- Mojave Desert Air Quality Management District (MDAQMD). 2009. *MDAQMD California Environmental Quality Act and Federal Conformity Guidelines*.
- San Bernardino County. 2007. *Final Program Environmental Impact Report for the General Plan Update*.
- . 2007a. *County of San Bernardino Development Code*.
- . 2007b. *County of San Bernardino 2007 General Plan*.
- . 2007c. *Facts, Findings, and Statement of Overriding Consideration Regarding the Environmental Effects from Implementation of the San Bernardino County General Plan Update*.
- . 2011. *San Bernardino County Greenhouse Gas Inventory and Reduction Plan*.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). *Final Staff Report: Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act*. December 17, 2009.
- South Coast Air Quality Management District (SCAQMD). 2008. Website: *Interim Greenhouse Gas Significance Thresholds for Stationary Sources, Rules and Regulations*. <http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html>
- Scorecard. 2010. *Land Contamination Report: San Bernardino County, CA*. http://www.scorecard.org/env-releases/land/county.tcl?fips_county_code=06071#trends (accessed December 2010).

6.0 REFERENCES

- South Coast Air Quality Management District (SCAQMD). 2009. *SCAQMD Air Quality Significance Thresholds*.
- Stats Indiana. 2010. *Overview of San Bernardino County, CA*. Updated July 28, 2010. http://www.stats.indiana.edu/uspr/a/usprofiles/06/us_over_sub_pr06071.html (accessed November 4, 2010).
- United States Army Corps of Engineers (USACE). 2006. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West*. ed. J. S. Wakeley, R.W . Lichvar, and C. V. Noble. ERDC/EL TR-06-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- United States Department of Agriculture (USDA), National Agricultural Statistics Service. 2009. *Summary of California's County Commissioner's Reports 2007–2008*.
- United States Department of Agriculture, Forest Service (USFS). 2010a. *Angeles National Forest*. <http://www.fs.usda.gov/wps/portal/>.
- . 2010b. *San Bernardino National Forest*. <http://www.fs.usda.gov/wps/portal/>.
- United States Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS). 2010. *Farmland Protection Program*. <http://www.nrcs.usda.gov/programs/farmland/1996/FPPfact.html>.
- United States Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA). 2009. <http://www.phmsa.dot.gov/> (accessed December 2010).
- United States Environmental Protection Agency (USEPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*.
- . 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*.
- . 2009a. <http://www.epa.gov>.
- . 2009b. *Laws, Regulations, Guidance and Dockets*. <http://www.epa.gov/lawsregs/> (accessed December 2010).
- U.S. Environmental Protection Agency (USEPA). 2010a. Website: Science. <http://www.epa.gov/highgwp1/scientific.html> ; <http://www.epa.gov/outreach/scientific.html> ; <http://www.epa.gov/nitrousoxide/scientific.html>
- U.S. Environmental Protection Agency (EPA). 2010b. *PSD and Title V Permitting Guidance for Greenhouse Gases*.
- U.S. Environmental Protection Agency (EPA). 2008. *Climate Change – Greenhouse Gas Emissions: Carbon Dioxide*.

7.0 REPORT PREPARERS

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APPENDICES

**APPENDIX A - NOTICE OF
PREPARATION/INITIAL STUDY
AND COMMENTS RECEIVED**

LAND USE SERVICES DEPARTMENT



COUNTY OF SAN BERNARDINO

PLANNING DIVISION

385 North Arrowhead Avenue • San Bernardino, CA 92415-0182
(909) 387-4147 Fax (909) 387-3223
<http://www.sbcounty.gov/landuseservices>

DENA M. SMITH
Director

September 20, 2010

TO: RESPONSIBLE TRUSTEE AGENCIES
INTERESTED ORGANIZATIONS AND INDIVIDUALS

NOTICE OF PREPARATION OF A DRAFT SUPPLEMENT TO THE COUNTY OF SAN BERNARDINO GENERAL PLAN PROGRAM ENVIRONMENTAL IMPACT REPORT (SEIR) FOR THE PROPOSED COUNTYWIDE GREENHOUSE GAS (GHG) EMISSIONS GENERAL PLAN AMENDMENT, GHG REDUCTION PLAN AND DEVELOPMENT CODE AMENDMENTS

This Notice provides a description of the proposed project and solicits comments from responsible agencies, trustee agencies, federal, state and local agencies and the general public, on the scope and content of the environmental document to be prepared to analyze the environmental impacts of the proposed Countywide Greenhouse Gas (GHG) Emissions General Plan Amendment, GHG Reduction Plan and Development Code Amendments ("Project"). Comments received in response to this Notice will be reviewed and considered by the County of San Bernardino ("lead agency," "County") in determining the scope of the Draft SEIR. Due to time limits, as defined by the California Environmental Quality Act (CEQA), your response should be sent at the earliest possible date, but no later than 30 days after publication of this notice. If you work for a public agency, your comments should address the scope and content of environmental information that is germane to the agency's statutory responsibilities, as required by Section 15082(b) of the State Guidelines for the California Environmental Quality Act (CEQA). A summary of the project and potential environmental effects proposed for analysis is provided below.

Written comments can be submitted at any time during the notice period which begins **September 20, 2010** and ends at 4:45 PM on **October 20, 2010**. Letters should be directed to:

County of San Bernardino
Land Use Services Department
ATTN: Doug Feremenga, Associate Planner
Land Use Services Department
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415
Fax: 909.387.3223
Email: dferemenga@lud.sbccounty.gov

A Public Workshop on the GHG Emissions Reduction Plan followed by a Public Scoping Meeting on the Draft SEIR will be held on **September 29, 2010**. The Workshop will begin at **2:00 pm** in the Board of Supervisors Hearing Chambers, County Government Center, 385 N. Arrowhead Ave., First Floor, San Bernardino, CA 92415. The Public Scoping meeting will begin immediately after the workshop at the same location. The workshop will provide information on the GHG Plan and the scoping meeting will provide an opportunity to submit written comments on the scope of the environmental review to be presented in the Draft SEIR.

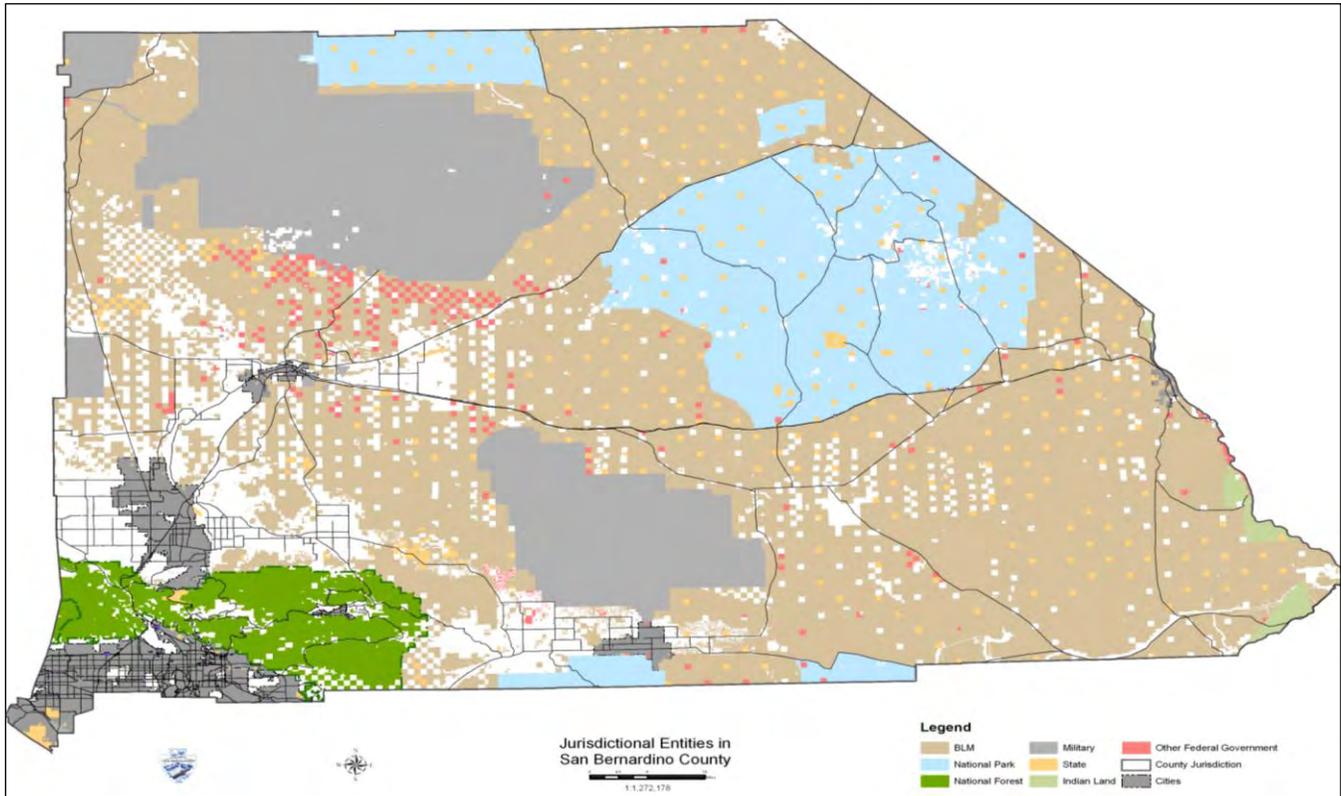
GREGORY C. DEVEREAUX
County Administrative Officer

Board of Supervisors
BRAD MITZELFELT.....First District
PAUL BIANE.....Second District
NEIL DERRYThird District
GARY C. OVITT.....Fourth District
JOSIE GONZALES.....Fifth District

Project Location:

The General Plan Amendment and associated GHG Emissions Reduction Plan address the reduction of GHG emissions in the unincorporated areas of San Bernardino County, California that are under the County's land use authority, as well as all County owned or operated facilities, whether within an incorporated city, town or within an unincorporated area.

Figure 1-1: Jurisdictional Land Use Authority in San Bernardino County



Project History/Background:

Following the County's adoption of its General Plan in March 2007, the California Attorney General filed a lawsuit alleging that the EIR prepared for the General Plan Update did not comply with the requirements of CEQA in its analysis of GHG emissions and climate change. Subsequently, the County and the Attorney General entered into an agreement to settle the lawsuit, which included an agreement by the County to: (1) prepare an amendment to its General Plan adding a policy that describes the County's goal of reducing those GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations; and, (2) prepare a GHG Emissions Reduction Plan, which includes inventories, a reduction target, and, reduction measures to meet the reduction target, by regulating those sources of GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations.

Project Description:

The County of San Bernardino is preparing a General Plan Amendment and associated GHG Emissions Reduction Plan (GHG Plan). The project also includes a Development Code Amendment that will provide specific procedures for implementing development related provisions of the GHG Plan.

1. General Plan Amendment.

The County will amend its General Plan to include a policy and programs addressing the County's intent to reduce GHG emissions that are reasonably attributable to: (1) the County's internal activities, services and facilities, and (2) private industry and development that is located within the area subject to the County's land use and building permit authority.

2. GHG Emission Reduction Plan.

The GHG Plan addresses two distinct categories: (1) County's internal operations ("Internal") and (2) County's land use jurisdiction area ("External") operations. The Internal category simply covers those operational activities, services and facilities that the County has direct responsibility for and control over. Examples include County vehicles and equipment, as well as buildings and other County owned facilities such as airports. External activities are those that the County has indirect influence or regulatory authority over. External sources are essentially private sector development, industry and business in the unincorporated portion of San Bernardino County that are subject to the County's land use authority. The GHG Plan provides different emissions reduction goals, objectives and strategies for these two. External emissions are further differentiated into six sectors that include Building Energy Use, Transportation and Land Use, Solid Waste/Landfills, Stationary Sources, Agriculture and Resource and Conservation, and Water Conservation. The Internal emissions are differentiated into County facilities, County fleet, solid waste, employee commute, and water conservation. The use of these sectors allow for application of more discrete reduction strategies.

The framework of the GHG Plan consists of: (1) an inventory of GHG emissions that identifies and quantifies existing emissions and projected future emissions; (2) a reduction target to reduce existing GHG emissions by 15% by 2020; and, (2) the goals, objectives and strategies that have been devised to reduce existing emissions to meet the reduction target. The County's GHG Plan and its reduction target are based on Assembly Bill (AB) 32 and the California Air Resources Board (CARB) recommendations to ensure that California emissions are reduced to 1990 levels by the year 2020. The CARB has recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction plan. For the purpose of defining "existing" emission levels, the County chose the emissions in the year 2007 as baseline, existing emissions conditions.

The GHG emissions reduction measures identified in the Plan include existing and proposed state, regional, county and other local measures that will reduce GHG emission in the Internal and External categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures, i.e. state, regional, local, and also whether the measure is quantifiable in terms of calculating a volume of emission reduction.

Emission Reduction Classifications:

- *Reduction Class 1* – All adopted, implemented, and proposed state and regional measures that are capable of producing quantifiable emission reductions.
- *Reduction Class 2* – All measures currently implemented or proposed for implementation by the County that are capable of producing quantifiable emission reductions.
- *Reduction Class 3* – Other measures currently implemented or proposed for implementation by the County that are not quantifiable at this point in time, but are recognized as actions that can have a positive effect on GHG emission reduction.

No federal measures were relied upon to achieve the reduction targets included in this plan due to the uncertainty surrounding federal action at this time.

A summary of greenhouse gas reduction measures that are under consideration can be found in Attachment A to this document.

3. Development Code Amendments.

The project to be considered in the Draft SEIR will also include amendments to the Development Code codifying some of the GHG emissions reduction measures, such as the development review process for new development projects.

Environmental Review:

The County will be preparing a draft Supplement EIR to the County General Plan Program EIR (State Clearinghouse No. 2005101038) to address the environmental effects specific to the proposed General Plan Amendment, GHG Plan and associated Development Code Amendments. The draft Supplement EIR to the General Plan Program EIR (Draft SEIR) will address the environmental effects of implementing the General Plan Amendment, associated GHG Plan and Development Code Amendments in light of the previous environmental review in the General Plan Program EIR as provided for under CEQA Guidelines 15163.

The Draft SEIR will evaluate the effects of the proposed policies and GHG emissions reduction measures on the environment. The environmental analysis will assess whether the measures and strategies of the GHG Plan will cause a direct or indirect physical effect on issues such as aesthetics/visual, historical and archaeological resources, transportation, air quality, etc, including all the subjects addressed in the General Plan Program EIR.

The Draft SEIR will not analyze the impacts of environmental issues associated with implementation of the General Plan (such as growth within the County) as they were addressed in the General Plan Program EIR and are not associated with implementation of the General Plan Amendment and the GHG Plan.

Agency representatives, members of the public, and other interested parties are encouraged to provide comments concerning any environmental issues that should be explored in the Draft SEIR.

ATTACHMENT A

GHG EMISSION REDUCTION MEASURES

REDUCTION MEASURES:

The emission reduction measures included in the Plan include existing and proposed federal, state, regional, county, and other local measures that will result in GHG emissions reductions of those emissions inventoried in both the External and Internal Inventories for the County's Land Use Authority (LUA) area or internal operations. The emission reduction measures are organized as follows, for each emissions sector:

Reduction Class 1 (R1) includes all adopted, implemented, and proposed state, and regional measures that will result in GHG reductions for the County's LUA area and internal operations.¹ These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.

Reduction Class 2 (R2) includes all measures currently implemented or in the process of implementation by the County, as well as any additional quantifiable measures that require County action and could further reduce the GHG emissions for the County's LUA area and internal operations. R2 also includes any federal, state, and regional measures that require substantial action by the County to achieve the expected GHG reductions.

Reduction Class 3 (R3) includes all additional and/or complementary measures considered reasonable but that were not used to demonstrate achievement of the proposed County 2020 GHG emissions reduction target. For these measures, emission reductions have either not been quantified due to a lack of available data or protocols required for quantification or uncertainly regarding the County's jurisdictional control over relevant emissions sources. Some of these were quantified but require additional refinement and are therefore not included in R1 or R2.

The Plan includes a detailed discussion of the quantification methodology applied for each reduction measure for the external and internal reduction plans, respectively. The reduction quantification methodology for R1, R2, and R3 measures is summarized below:

R1 measures were primarily quantified consistent with the CARB methodology outlined in the AB 32 Scoping Plan. In the AB 32 Scoping Plan, CARB quantified reductions associated with each measure identified in the Scoping Plan. The percent reduction associated with each of the AB32 Scoping Plan measures was directly applied to the 2020 "business as usual" (or BAU) GHG inventory.

R2 measures were quantified on a case-by-case basis, based on available information as well as other protocols and studies. To avoid double counting reductions from R1 measures, reductions from R2 measures incorporate relevant R1 measures and preceding R2 measures. For example, R2T3 (Congestion Pricing and Driving Disincentives) applies to external on-road emissions after all R1 transportation measures, as well as measures R2T1 and R2T2, have been addressed.

R3 measures were either quantified on a case-by-case basis, as discussed above for R2 measures, or were not quantified due to lack of available data or protocols.

Below is a list of R1, R2 and R3 measures that have been incorporated into the GHG Plan.

¹ Includes County buildings located in cities (incorporated areas) which are included in the Internal inventory but not in the External inventory.

ATTACHMENT A

GHG EMISSION REDUCTION MEASURES

EXTERNAL PLAN:

R1 Measures

- Renewable Portfolio Standard – 33 percent by 2020 (AB 32)
- Residential Lighting (AB 1109)
- Commercial/Outdoor Lighting (AB 1109)
- Electricity Energy Efficiency (AB 32)
- Natural Gas Energy Efficiency (AB 32)
- Increased Combined Heat and Power (AB 32)
- Industrial Boiler Efficiency (AB 32)
- California Light-Duty Vehicle GHG Standards: Implement Pavley I Standards (AB 1493)
- California Light-Duty Vehicle GHG Standards: Implement Pavley II (AB 32)
- Low Carbon Fuel Standard (AB 32)
- Tire Pressure Program (AB 32)
- Low Rolling Resistance Tires (AB 32)
- Low Friction Engine Oils (AB 32)
- Cool Paints and Reflective Glazing (AB 32)
- Goods Movement Efficiency Measures (AB 32)
- Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency) (AB 32)
- Medium-and Heavy-Duty Vehicle Hybridization (AB 32)
- SCAQMD Rule 1192—Clean On-Road Transit Buses
- SCAQMD Rule 1195—Clean On-Road School Buses
- Oil and Gas Extraction Combustion Related GHG Emission Reduction (AB 32)
- Stationary Internal Combustion Engine electrification (AB 32)
- Carbon Intensity Standard for Cement Plants (AB 32)
- Carbon Intensity Standard for Concrete Batch Plants (AB 32)
- Waste Reduction in Concrete Use (AB 32)
- Methane Capture at Large Dairies (AB 32)
- Per Capita Water Use Reduction Goal Policy (SBX7 7 – Steinberg)

ATTACHMENT A

GHG EMISSION REDUCTION MEASURES

R2 Measures

- County's Review and Approval of New Development Projects
- Residential Energy Efficiency Retrofits
- Commercial Energy Efficiency Retrofits
- Residential Retrofit Solar Incentives
- Warehouse Solar Incentive Program
- Solar Hot Water Incentives
- Anti-Idling Enforcement Policy
- Employment Based Trip and VMT Reductions Policy
- Revise Parking Policies
- Roadway Improvements including Signal Synchronization and Traffic Flow Management
- Expand Renewable Fuel/Low-Emission Vehicle Use
- Ridesharing and Carpooling
- Bicycle/Pedestrian Infrastructure and Promotion
- Construct High Occupancy Vehicle (HOV) Lanes
- Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills
- Barstow Methane Recovery
- Landers Methane Recovery
- Comprehensive Disposal Site Diversion Program
- C&D Recycling Program
- County Diversion Programs — 75 Percent Goal
- City Diversion Programs— 75 Percent Goal

R3 Measures

- Green Building Development Facilitation and Streamlining
- Green Building Training
- Community Building Energy Efficiency & Conservation for Existing Buildings
- Energy Efficiency Financing
- Heat Island Mitigation Plan
- Public Education
- Cross-Jurisdictional Coordination
- Community Alternative Energy Development Plan
- Support Utility-Scale Renewable Energy Siting and Transmission Lines

ATTACHMENT A

GHG EMISSION REDUCTION MEASURES

- Identify and Resolve Potential Barriers to Renewable Energy Deployment
- Solar Ready Buildings Promotion
- Renewable Energy Financing
- Regional Renewable Energy Collaboration
- County Renewable Energy Production
- Outdoor Lighting
- Off-Site Mitigation of GHG Impacts for New Development
- Public Transit Measures
- Diesel Exhaust Emissions Control Measures
- Regional Land Use/Transportation Coordination
- Regional Employment Based Trip Reduction Programs.
- County Commuter Services Program.
- Home Employment.
- Intelligent Transportation Systems Applications.
- Public Outreach and Educational Programs Relative to Various Modes of Transportation.
- Install Methane Capture Systems at all Landfills with 250,000 or more Tons of Waste In Place
- Waste Education Program
- Additional Landfill Methane Controls
- Landfill Gas to Energy Projects
- Water Efficiency Pricing Policy
- Manage Storm Water Runoff
- Conservation Areas
- Leverage Existing Financing Mechanisms and Opportunities (to support transportation reductions, waste reductions, and water conservation)

INTERNAL PLAN:

R1 Measures

- Renewable Portfolio Standard (33 percent) (AB 32)
- Energy Efficiency Standards for Lighting (AB 1109)
- Title 24 standards for Non-Residential Buildings
- California Light-Duty Vehicle GHG Standards: Implement Pavley I Standards (AB 1493)
- California Light-Duty Vehicle GHG Standards: Implement Pavley II (AB 32)
- Low Carbon Fuel Standard (AB 32)

ATTACHMENT A

GHG EMISSION REDUCTION MEASURES

- Tire Pressure Program (AB 32)
- Low Rolling Resistance Tires (AB 32)
- Low Friction Engine Oils (AB 32)
- Cool Paints and Reflective Glazing (AB 32)
- Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency) (AB 32)
- Medium-and Heavy-Duty Vehicle Hybridization (AB 32)
- SCAQMD Rule 1191—Clean On-Road Light- and Medium-Duty Public Fleet Vehicles
- SCAQMD Rule 1193—Clean On-Road Residential and Commercial Refuse Collection Vehicles
- SCAQMD Rule 1196—Clean On-Road Heavy-Duty Public Fleet Vehicles

R2 Measures

- Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills
- Barstow Methane Recovery
- Landers Methane Recovery
- Comprehensive Disposal Site Diversion Program
- Construction and Demolition Recycling Program
- County and City Diversion Programs—75 Percent Goal
- Leadership in Energy and Environmental Design Silver for New County Buildings
- Retro-commissioning of Existing Buildings
- Increase Use of Combined Heat and Power Systems
- Office Equipment Procurement Standard
- Leasing Procurement Standards
- Install Solar and Other Renewable Energy Sources on County Buildings
- Heating, Ventilating and Air Conditioning (HVAC) Retrofit Program
- Installation of Solar PV systems on five (5) County buildings
- Current fleet turnover proposed by County
- Retire All Passenger/Light-Duty Vehicles by 2020
- Retire All Heavy-duty Vehicles by 2020
- Require all heavy-duty fire department vehicles to run on Compressed Natural Gas (comply with SCAQMD Rule 1196)
- Require all fire department vehicles to comply with SCAQMD Rule 1191
- Expand Vanpool Program
- Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving

ATTACHMENT A

GHG EMISSION REDUCTION MEASURES

- Increase Bicycling and Walking
- Increase the Use of Public Transit as an Alternative to Driving
- Increase Use of Clean Air Vehicles

R3 Measures

- Utilize Incentives Offered by Southern California Edison Partnership
- Benchmark Existing Buildings
- Link Utility Payment/Energy Usage Data into the Computer Aided Facilities Management Database
- Train County Employees on Energy Efficiency and Conservation
- Institute a Capital Reinvestment Fund
- Apply Energy Saving Design Features
- Implement Accelerated Vehicle Fleet Turnover for “Other” Vehicles
- Use Hybrid/ULEV Vehicles
- Implement Early Tire Inflation Program
- Implement Early Anti-Idling Enforcement
- Implement Smart Driving Policy
- Implement Vehicle Maintenance Program
- SB 375 Planning
- California's Low-Emission Vehicle (LEV) Regulations
- Zero Emission Vehicle (ZEV) Program
- Small Tools and Equipment
- Strengthen the Comprehensive Disposal Site Diversion Program
- Increase Methane Recovery at Milliken and Colton Landfills to 95 percent
- Increase Methane Recovery at Victorville, San Timoteo, and Barstow landfills to 85 percent
- Install Methane Capture Systems at all Landfills with 250,000 or more Tons of Waste In Place
- Leverage Existing Financing Mechanisms and Opportunities for Waste Reduction
- Waste Education Program
- Additional Landfill Methane Controls
- Landfill Gas to Energy Projects
- Contracting Practices
- Tree Management
- Landscaping



NOTICE OF PUBLIC WORKSHOP & SCOPING MEETING

A PUBLIC WORKSHOP HAS BEEN SCHEDULED TO PROVIDE INFORMATION AND RECEIVE INPUT ON THE COUNTY'S PROPOSED GENERAL PLAN AMENDMENT, GREENHOUSE GAS EMISSIONS REDUCTION PLAN AND ASSOCIATED DEVELOPMENT CODE AMENDMENTS.

A PUBLIC SCOPING MEETING ON THE PROPOSED DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT FOR THE PROJECT WILL BE CONDUCTED IMMEDIATELY FOLLOWING THE WORKSHOP

PROJECT DESCRIPTION

The County of San Bernardino is preparing a General Plan Amendment addressing GHG emissions, a Countywide Greenhouse Gas (GHG) Emissions Reduction Plan ("GHG Plan"), and as lead agency under the California Environmental Quality Act (CEQA), a Draft Supplement to the County General Plan Program Environmental Impact Report (SCH No. 2005101038). The General Plan Amendment adds to the General Plan the policy and programs addressing the reduction of GHG emissions within the County boundaries. The GHG Plan addresses the reduction of GHG emissions in the unincorporated areas of the County that are under the County's land use authority, as well as all County operations and facilities, whether within an incorporated city, town or within an unincorporated area. The draft SEIR will address the environmental effects of implementing the GHG Plan in light of the previous environmental review in the General Plan Program EIR as provided for under CEQA Guidelines 15163.

The Public Workshop on the GHG Emissions Reduction Plan will be immediately followed by a Public Scoping Meeting on the Draft Supplemental Environmental Impact Report.

DATE: Wednesday, September 29, 2010
TIME: 2:00 pm
PLACE: San Bernardino County Government Center
Board of Supervisors Hearing Chambers (First Floor)
385 N. Arrowhead Avenue – [Between 3rd and 5th Streets]
San Bernardino, CA 92415

The Notice of Preparation and Initial Study is also posted on the County Land Use Services Department web page at www.sbcounty.gov/landuseservices. A copy of the Notice of Preparation and Initial Study may also be viewed at the San Bernardino County Land Use Services Department 385 N. Arrowhead Ave., First Floor, San Bernardino, CA 92415.

COUNTY OF SAN BERNARDINO
GENERAL PLAN AMENDMENT AND
COUNTYWIDE GREENHOUSE GAS (GHG)
EMISSIONS REDUCTION PLAN
INITIAL ENVIRONMENTAL STUDY

Prepared for:

COUNTY OF SAN BERNARDINO
LAND USE SERVICES DEPARTMENT
385 N. ARROWHEAD AVENUE, FIRST FLOOR
SAN BERNARDINO, CA 92415

Prepared by:



21171 S. WESTERN AVENUE, SUITE 200
TORRANCE, CA 90501

SEPTEMBER 2010

COUNTY OF SAN BERNARDINO
GENERAL PLAN AMENDMENT AND
COUNTYWIDE GREENHOUSE GAS (GHG)
EMISSIONS REDUCTION PLAN
INITIAL ENVIRONMENTAL STUDY

Prepared for:

COUNTY OF SAN BERNARDINO
LAND USE SERVICES DEPARTMENT
385 N. ARROWHEAD AVENUE, FIRST FLOOR
SAN BERNARDINO, CA 92415

Prepared by:

PMC
21171 S. WESTERN AVENUE, SUITE 200
TORRANCE, CA 90501

SEPTEMBER 2010

INITIAL ENVIRONMENTAL STUDY

Project Title: County of San Bernardino General Plan Amendment and Countywide Greenhouse Gas (GHG) Emissions Reduction Plan

Lead Agency Name and Address: County of San Bernardino Land Use Services Department

Project Location: Unincorporated areas of San Bernardino County, California that are under the County's land use authority, as well as all County owned or operated facilities, whether within an incorporated city, town or within an unincorporated area.

Project Sponsor's Name: County of San Bernardino

General Plan Designation(s): Various

Zoning: Various

Contact Person: Doug Feremenga

Phone Number: 909-387-0240

Date Prepared: 09/17/2010

PROJECT DESCRIPTION

I. PROJECT LOCATION

The total land area that comprises San Bernardino County is approximately 13 million acres. Federal and state agencies own and control 81 percent (10.5 million acres) of the total County lands (approximately 13 million acres) and approximately four (4) percent lies within 24 incorporated cities and is directly regulated by the respective city councils (see Figure 1-1 of the NOP). The GHG Emissions Reduction Plan addresses the reduction of GHG emissions in the unincorporated areas of San Bernardino County, California that are under the County's land use as well as all County operational activities and facilities, whether within an incorporated city, town or within an unincorporated area.

II. HISTORY

Following the County's adoption of its General Plan in March 2007, the California Attorney General filed a lawsuit alleging that the EIR prepared for the General Plan Update did not comply with the requirements of CEQA in its analysis of GHG emissions and climate change. Subsequently, the County and the Attorney General entered into an agreement to settle the lawsuit, which included an agreement by the County to: (1) prepare an amendment to its General Plan adding a policy that describes the County's goal of reducing those GHG emissions

reasonably attributable to the County's discretionary land use decisions and the County's internal government operations; and, (2) prepare a GHG Emissions Reduction Plan, which includes inventories, a reduction target, and, reduction measures to meet the reduction target, by regulating those sources of GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations.

III. PROJECT CHARACTERISTICS

The project consists of the proposed adoption a General Plan Amendment, a GHG Emissions Reduction Plan (GHG Plan) and associated Development Code Amendment to include greenhouse gas emissions reduction policy provisions and specific procedures for implementing development related provisions of the GHG Plan in the development code. The plan and concurrent amendments are briefly described below:

A. General Plan Amendment

The County will amend its General Plan to include a policy and programs addressing the County's intent to reduce GHG emissions that are reasonably attributable to: (1) the County's internal activities, services and facilities, and (2) private industry and development that is located within the area subject to the County's land use and building permit authority.

B. GHG Emission Reduction Plan

The GHG Plan addresses two distinct categories: (1) County's internal operations ("Internal") and (2) County's land use jurisdiction area ("External") operations. The Internal category simply covers those operational activities, services and facilities that the County has direct responsibility for and control over. Examples include County vehicles and equipment, as well as buildings and other County owned facilities such as airports. External activities are those that the County has indirect influence or regulatory authority over. External sources are essentially private sector development, industry and business in the unincorporated portion of San Bernardino County that are subject to the County's land use authority. The GHG Plan provides different emissions reduction goals, objectives and strategies for these two. External emissions are further differentiated into six sectors that include Building Energy Use, Transportation and Land Use, Solid Waste/Landfills, Stationary Sources, Agriculture and Resource and Conservation, and Water Conservation. The Internal emissions are differentiated into County facilities, County fleet, solid waste, employee commute, and water conservation. The use of these sectors allow for application of more discrete reduction strategies.

The framework of the GHG Plan consists of: (1) an inventory of GHG emissions that identifies and quantifies existing emissions and projected future emissions; (2) a reduction target to reduce existing GHG emissions by 15% by 2020; and, (2) the goals, objectives and strategies that have been devised to reduce existing emissions to meet the reduction target. The County's GHG Plan and its reduction target are consistent with Assembly Bill (AB) 32 and the California Air Resources Board (CARB) recommendations to ensure that California emissions are reduced to 1990 levels by the year 2020. The CARB has recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction plan. For the purpose of defining "existing" emission levels, the County chose the emissions in the year 2007 as baseline, existing emissions conditions.

The GHG emissions reduction measures identified in the Plan include existing and proposed state, regional, county and other local measures that will reduce GHG emission in the Internal

and External categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures, i.e. state, regional, local, and also whether the measure is quantifiable in terms of calculating a volume of emission reduction.

Emission Reduction Classifications

- Reduction Class 1 – All adopted, implemented, and proposed state and regional measures that are capable of producing quantifiable emission reductions.
- Reduction Class 2 – All measures currently implemented or proposed for implementation by the County that are capable of producing quantifiable emission reductions.
- Reduction Class 3 – Other measures currently implemented or proposed for implementation by the County that are not quantifiable at this point in time, but are recognized as actions that can have a positive effect on GHG emission reduction.

No federal measures were relied upon to achieve the reduction targets included in this plan due to the uncertainty surrounding federal action at this time.

A summary of greenhouse gas reduction measures that are under consideration can be found in Attachment A to the Notice of Preparation document.

C. Development Code Amendments

The project to be considered in the Draft SEIR will also include amendments to the Development Code codifying some of the GHG emissions reduction measures, such as the development review process for new development projects.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, as indicated by the checklist and corresponding discussion on the following pages.

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Aesthetics | <input checked="" type="checkbox"/> Agricultural Resources and Forestry Resources | <input checked="" type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology / Soils |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning | <input type="checkbox"/> Mineral Resources | <input checked="" type="checkbox"/> Noise |
| <input type="checkbox"/> Population / Housing | <input checked="" type="checkbox"/> Public Services | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation / Traffic | <input checked="" type="checkbox"/> Utilities / Service Systems | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

PURPOSE OF THIS INITIAL STUDY

This Initial Study has been prepared consistent with CEQA Guidelines Sections 15162 through 15164 to determine the extent to which the proposed project, including the General Plan Amendment, the GHG Plan, and the associated Development Code amendments, will result in new or substantially more severe environmental impacts, or otherwise require preparation of a supplemental EIR, pursuant to the standards set forth in those Guidelines. Based on the analysis in this initial study, The County will be preparing a draft Supplement to the County General Plan Program EIR (GP EIR) (State Clearinghouse No. 2005101038) to address the factors set forth in Guidelines 15162 through 15164, including the extent to which the proposed General Plan Amendment, GHG Plan and associated Development Code Amendments will result in new or substantially more severe environmental impacts. Thus, the draft Supplement to the GP EIR (Draft SEIR) will address the environmental effects of implementing the GHG Plan in light of the previous environmental review in the GP EIR as provided for under CEQA Guidelines 15063(b)(1)(C).

The GP EIR is available for review at the following address:

County of San Bernardino
Land Use Services Department
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415

The General Plan Amendment is proposed to add policies to the General Plan specifically calling for the reduction of greenhouse gas emissions. The GHG Plan is proposed as a measure to implement the General Plan, including the proposed greenhouse gas policies to be added, and is not a revision to the overall policy framework and land use pattern of the General Plan. The environmental analysis will assess whether the measures and strategies of the GHG Plan will cause a direct or indirect physical effect on the environment. The Draft SEIR will not analyze the impacts of environmental issues associated with implementation of the General Plan (such as growth within the County) as they were addressed in the GP EIR and are not associated with implementation of the GHG Plan.

EVALUATION OF ENVIRONMENTAL IMPACTS

Pursuant to CEQA Guidelines Sections 15162 through 15164, the analysis provided below utilizes CEQA Guidelines Appendix G and the analysis from the GP EIR and makes the following possible determinations:

1. "Less Than Significant or No Impact" - the impact simply does not apply to the project.
2. "Impact Adequately Addressed in Program EIR" – the project would not result in a new or increased severity of an environmental impact that was addressed in the General Plan Program EIR.
3. "Less Than Significant Impact Due to Project Measures" – the project contains measures that address and mitigate the potential impact.
4. "Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR" – the project may result in a significant new or increased severity of an environmental impact not considered in the General Plan Program EIR.

I. AESTHETICS Would the project:	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
a) Have a substantial adverse effect on a scenic vista?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino GP EIR

DISCUSSION/CONCLUSION

a-d) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

According to the County of San Bernardino GP EIR (GP EIR), there is a potential for implementation of the General Plan to impact local scenic resources and vistas. The GP EIR proposed mitigation measures to reduce the General Plan's impacts to scenic resources, and concluded that the impacts would be The GP EIR includes mitigation measures that will partially mitigate this impact. Although adverse effects related to scenic vistas and resources were addressed in the GP EIR, there are numerous interstate routes, state highways, county roads and roads on federal lands are either designated scenic highways or byways. The GP EIR found that development of the plan area would potentially result in significant impacts to scenic vistas or scenic resources. Adverse effects on views due to the creation of new sources of substantial light or glare were addressed in the GP EIR. It was determined that implementation of the General Plan would result in a potentially significant impact to the existing views due to the creation of new sources of substantial light or glare. The GP EIR proposed a mitigation measure that requires the use of the Glare and Outdoor Lighting section of the Development Code to help preserve dark skies in the Mountain and Desert Regions of the County. The GP EIR concluded that despite the imposition of mitigation measures these impacts cannot be fully mitigated to a level below significance.

Implementation of reduction measures in the GHG Plan will have a potentially significant impact on scenic highways and resources, degrade existing visual resources and introduce new sources of light and glare. For example, the installation of solar photovoltaic panels (e.g., Residential Retrofit Solar Incentives and Warehouse Solar Incentive Program) may have impacts to scenic vistas and resources, or degrade existing visual character of introduce new sources of light and glare. Therefore, these new potential impacts will be addressed in the Draft SEIR.

II. AGRICULTURE RESOURCES				
<p>In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997), prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland.</p> <p>Would the project:</p>	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
	a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-e) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects related to the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, conflict with existing zoning for agricultural use or Williamson Act contracts, or involving changes in the existing environment which could result in conversion of Farmland, to non-agricultural use were addressed in the GP EIR, which found that development of the plan area would result in impacts to agricultural resources and mitigation measures will

partially mitigate this impact. Mitigation measures that were included in the EIR only partially mitigate impacts to agricultural resources. The measures require the following: the protection of prime agricultural lands from the adverse effects of urban encroachment; the avoidance of highly alkaline soils for agricultural uses; allowance for the development of prime agricultural lands only after the supply of non-productive areas has been exhausted; use of the Williamson Act to preserve commercially viable agricultural areas; and County support of property and estate tax relief measures that assess long-term agriculture at farm-use value. Additionally, the County will encourage agriculture use of commercially productive agricultural lands and discourage city sphere of influence extensions into areas containing commercially productive agricultural lands. The GP EIR concluded that despite the imposition of mitigation measures these impacts cannot be fully mitigated to a level below significance.

There is a potential for the implementation of reduction measures in the GHG Plan to have further impacts to agricultural lands and uses. For example, the siting of new renewable energy generating facilities and supporting facilities (e.g., Renewable Portfolio Standard) may have impacts to agricultural lands and uses. Therefore, these new impacts will be addressed in the Draft SEIR. Additionally, the Draft SEIR will include a discussion of potential impacts to forestland or forestland conversion associated with GHG Plan implementation of reduction measures.

III. AIR QUALITY				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
	a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) 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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in significant construction-related air quality impacts?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-c) Impact Adequately Addressed in Program EIR. Adverse effects on associated with growth facilitated by the update of the General Plan will result in the construction of new roads and infrastructure and the increased urbanization of agricultural lands leading to increased emissions. Growth will also create emissions that affect sensitive populations (e.g., those with respiratory illness and the older population). The GP EIR includes mitigation measures that will partially mitigate this impact.

The purpose of the GHG Plan is to aggressively reduce GHG emissions within the County, therefore implementation of the plan would not result in a potentially significant impact by conflicting with or obstructing the implementation of the applicable air quality plan South Coast Air Quality Management District (SCAQMD) or Mojave Desert Air Quality Management District (MDAQMD) plans; violate air quality standard; or contribute substantially to an existing or projected air quality violation or 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). This determination was made based upon the nature that reduction

measures in the GHG Plan include several measures that would further assist in improving air quality (e.g., reduction measures “Anti-Idling Enforcement Policy”, “Expand Renewable Fuel/Low-Emission Vehicle Use”, and “Current Fleet Turnover Proposed by County”). These impacts will not be addressed in the Draft SEIR.

d) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse impacts associated with construction emissions were addressed in the previous environmental documents prepared for the GP EIR, which found that growth facilitated by the update of the General Plan will result in the construction of new roads and infrastructure and the increased urbanization of agricultural lands leading to increased emissions. The GP EIR includes mitigation measures that will partially mitigate this impact.

There is the potential for construction activities to occur when implementing the reduction measures of the GHG Plan. The GP EIR includes mitigation measures that will partially mitigate this impact. The result of these activities could potentially result in significant construction-related air quality impacts. This new impact will be addressed in the Draft SEIR.

e) Impact Adequately Addressed in Program EIR.

Adverse impacts associated with carbon monoxide concentrations were addressed in the previous environmental documents prepared for the GP EIR, which found that new vehicle trips add to carbon monoxide concentrations near streets providing access to, from, and within the project site. The GP EIR includes mitigation measures that will partially mitigate this impact. The project is located in an area with low background carbon monoxide concentrations. San Bernardino County is in an attainment area for the carbon monoxide ambient standards. State protocol for carbon monoxide studies provides that within attainment areas for carbon monoxide, signalized intersections having a Level of Service (LOS) of E or F represent a potential CO violation and require further analysis. Because the project is not proposing additional traffic trips, but instead provides traffic trip reduction measures through policies, programs or discrete actions identified in the GHG Plan. Therefore, these impacts will not be addressed in the Draft SEIR.

f) Impact Adequately Addressed in Program EIR.

Adverse impacts associate with increased odors on downwind receptors was addressed in previous environmental documents prepared for the GP EIR. The proposed project is not expected to result in substantial odors for downwind receptors. The GP EIR includes mitigation measures that will partially mitigate this impact. Air pollution control district nuisance regulations would ensure that any substantial releases of odors would be eliminated pursuant to enforcement actions. Therefore, these impacts will not be addressed in the Draft SEIR.

IV. BIOLOGICAL RESOURCES	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) 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 the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) 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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

The GP EIR found the potential for adverse effects on special status species that may occur within the Valley, Mountain Desert regions of the County. The EIR included a biological assessment of these species. The GP EIR adopted mitigation measures the fully mitigated this impact.

However, there is a potential for the implementation of reduction measures in the GHG Plan to have further impacts to special status species. For example, the siting of new renewable energy generating facilities and supporting facilities (e.g., reduction measure "Renewable Portfolio Standard") may have impacts to special-status species and their associated habitats both in regards to ground disturbance and operation (e.g., conflicts with wind turbines and birds). Other reduction measures also have the potential to impact special-status species. Therefore, these new impacts will be addressed in the Draft SEIR.

b) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects on riparian habitat or other sensitive natural communities were addressed in the previous environmental documents prepared for the GP EIR which found that development allowed by the General Plan Update will adversely impact riparian habitat or other sensitive natural communities as identified by state and federal agencies in the Valley, Mountain and Desert Regions of the County. The GP EIR includes mitigation measures that will partially mitigate this impact.

There is a potential for the implementation of reduction measures in the GHG Plan to have further impacts to riparian habitat or other sensitive natural communities. For example, the siting of new renewable energy generating facilities and supporting facilities (e.g., reduction measure "Renewable Portfolio Standard") may have impacts to riparian habitat or other sensitive natural communities. Other reduction measures also have the potential to impact sensitive natural communities. Therefore, these new impacts will be addressed in the Draft SEIR.

c) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects on wetlands were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in a potentially significant impact to wetlands in the plan area. It determined that mitigation reduced the impact to the loss of wetlands and the deposition of pollutants and sediments in sensitive wetland habitats to less than significant.

There is a potential for the implementation of reduction measures in the GHG Plan to have further impacts to wetland resources. For example, the siting of new renewable energy generating facilities and supporting facilities (e.g., reduction measure "Renewable Portfolio Standard") may have impacts to wetlands. Other reduction measures also have the potential to impact wetland resources. Therefore, these new impacts will be addressed in the Draft SEIR.

d) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects on migratory wildlife corridors were addressed in the previous environmental documents prepared for the San Bernardino County General Plan, which found that development of the plan area would result in a potentially significant impact to migratory wildlife corridors. It determined that mitigation reduced the impact to wildlife corridors to less than significant.

However, there is a potential for the implementation of reduction measures in the GHG Plan to have further impacts to migratory wildlife corridors and movement. For example, the siting of new renewable energy generating facilities and supporting facilities such as transmission lines (e.g., reduction measure "Renewable Portfolio Standard") may have impacts to migratory wildlife corridors and movement. Other reduction measures also have the potential to impact migratory wildlife corridors and movement. Therefore, these new impacts will be addressed in the Draft SEIR.

e, f) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects on local policies or ordinances protecting biological resources and Habitat Conservation Plans (HCP's) were addressed previous environmental documents prepared for the GP EIR , which found that development of the plan area will not conflict with local policies or ordinances protecting biological resources. It determined that mitigation reduced the impact to wildlife corridors to less than significant.

Although is it not expected that the proposed GHG Plan would conflict with on local policies or ordinances protecting biological resources and Habitat Conservation Plans (HCP's), this issue will be further evaluated in the Draft SEIR given the potential for facilities and improvements to result in significant biological resource impacts as noted above.

V. CULTURAL RESOURCES	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-d) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects on historic, cultural, and paleontological resources and human remains were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in a potentially significant impact to historic resources. It was determined that with mitigation measures, these impacts can be reduced to less than significant.

However, there is a potential for the implementation of reduction measures in the GHG Plan to have further significant impacts on historic, archaeological, and paleontological resources as well as human remains. For example, the installation of solar photovoltaic panels (e.g., reduction measure "Residential Retrofit Solar Incentives") may have impacts to historic structures, while the siting of new renewable energy generating facilities and supporting facilities such as transmission lines (e.g., reduction measure "Renewable Portfolio Standard") may have impacts to archaeological and paleontological resources as well as human remains. Therefore, these new impacts will be addressed in the Draft SEIR.

VI. GEOLOGY AND SOILS	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-e) Impact Adequately Addressed in Program EIR. Adverse effects related to geologic conditions, impacts and soils were addressed in the previous environmental documents prepared for the prepared for the San Bernardino County General PI GP EIR, which found that development of the plan area would result in a potentially significant impacts related to geological conditions and soil conditions. It was determined by the General Plan EIR, all impacts associated with geological and soils conditions could be mitigated to below a level of significance.

The GHG Plan does not result in any new development potential or construction of facilities that would be impacted by these conditions beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all of the County development standards regarding seismic and geologic stability. These impacts will not be addressed in the Draft SEIR.

INITIAL ENVIRONMENTAL STUDY

VII. GREENHOUSE GAS EMISSIONS	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISCUSSION/CONCLUSION

a-b) Less Than Significant or No Impact. This project is intended to reduce GHG emissions, consistent with AB 32, thus the project is expected to have beneficial impacts. The Draft SEIR will provide further details on the proposed GHG Reduction Plan and the measures to meet its targets consistent with AB 32.

VIII. HAZARDS AND HAZARDOUS MATERIALS	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

VIII. HAZARDS AND HAZARDOUS MATERIALS	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a) Impact Adequately Addressed in Program EIR. Adverse effects related to the routine transport, use, or disposal of hazardous materials and accident conditions involving the release of hazardous materials into the environment were addressed in the previous environmental documents prepared for the GP EIR, which found that with mitigation, development of the plan area would result in a less than significant impact related to the routine transport, use, or disposal of hazardous materials and accident conditions involving the release of hazardous materials into the environment.

The GHG Plan does not result in any new development potential or construction of facilities that require the routine transportation of hazardous materials that would be impacted by these conditions beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all local, state and federal standards regarding the transportation, use and disposal of hazardous materials. These impacts will not be addressed in the Draft SEIR.

b, c) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR

Adverse effects related to significant hazardous conditions due to risk of upset and accidents were addressed in the previous environmental documents prepared for the in the previous environmental documents prepared for the prepared for the GP EIR, which found that with mitigation, development of the plan area would result in a less than significant impact due to hazardous conditions.

However, there is the potential for significant hazardous conditions to be exposed to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment when implementing the GHG Plan. The result of these activities could potential result in significant hazardous conditions through the creation of methane recovery systems at landfills (e.g., reduction measure “Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills”) as well as disturbance of lead-based paint and asbestos containing materials from residential retrofits (e.g., reduction measure “Residential Energy Efficiency Retrofits”). This new impact will be addressed in the Draft SEIR.

d, e, f, g, h) Impact Adequately Addressed in Program EIR. Adverse effects related to being located on a listed hazardous materials site; located near a public or private airport; interfere with an adopted emergency response plan; or expose people or structures to wildland fires were all

addressed in the in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in a potentially significant impacts in the aforementioned issue areas. It was determined by the General Plan EIR, all impacts associated with public or private airport; interference with an adopted emergency response plan; or expose people or structures to wildland fires could be mitigated to below a level of significance.

The GHG Plan does not result in any new development potential or construction of facilities that would increase these types of hazardous conditions beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all local, state and federal policies and standards regarding hazards, airports, emergency response and evacuation plans, and wildfires. These impacts will not be addressed in the Draft SEIR.

IX. HYDROLOGY AND WATER QUALITY	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) 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 pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) 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 or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

IX. HYDROLOGY AND WATER QUALITY	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
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 flood hazard delineation map? (Source:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a, c, e, f) Impact Adequately Addressed in Program EIR. Adverse effects related to the soil erosion and water quality impacts were addressed in the previous environmental documents prepared for the GP EIR, which found that with mitigation, development of the plan area would result in a less than significant impact.

The GHG Reduction Plan does not result in any new development potential or construction of facilities that would impact water quality beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all of the County development standards regarding water quality. These impacts will not be addressed in the Draft SEIR.

b) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR. Adverse effects related to the depletion of groundwater requirements were addressed in the previous environmental documents prepared for the GP EIR, which found that with mitigation, development of the plan area would result in a less than significant impact related to groundwater supplies and interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Adopted mitigation measures and conditions of approval prepared for the General Plan and GP EIR reduce this impact to less than significant.

There is a potential for the implementation of reduction measures in the GHG Plan to have further significant impacts groundwater resources. For example, siting of new renewable energy

generating facilities and supporting facilities (e.g., reduction measure “Renewable Portfolio Standard”) may increase groundwater usage. Therefore, these new impacts will be addressed in the Draft SEIR.

d, g, h, i, j) Impact Adequately Addressed in Program EIR. Adverse effects related to alteration of the existing drainage pattern of the plan area resulting in flooding, flooding hazards and inundation by seiche, tsunami or mudflow were addressed in the previous environmental documents prepared for the for the GP EIR. The GP EIR found that these impacts are considered to be less than significant with the implementation of the mitigation measures.

The GHG Reduction Plan does not result in any new development potential or construction of facilities that would trigger additional flooding and drainage hazards beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all of the County development standards regarding drainage and placement of structures within the 100-year floodplain. These impacts will not be addressed in the Draft SEIR.

X. LAND USE AND PLANNING	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-c) Less Than Significant or No Impact. Adverse effects related to physically dividing an established community, conflict with applicable land use plans, policies or regulations and impacts to habitat conservation plans or natural community conservation plans were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in no impacts related to physically dividing an established community.

The GHG Plan does not result in any new development potential or construction of facilities and it would function as an implementation tool of the General Plan and does not modify designated land uses or patterns or policy provisions. These impacts will not be addressed in the Draft SEIR. The reader is referred to IV. Biological Resources for an analysis of consistency with a habitat conservation plan or natural community conservation plan.

XI. MINERAL RESOURCES	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a, b) Less Than Significant or No Impact. Adverse effects on mineral resources were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in a less than significant impact to the loss of availability of a known mineral resource or resource recovery site with the implementation of mitigation measures.

The GHG Plan does not result in any new development potential or construction of facilities that would propose changes to designated mineral resource areas beyond what the GP EIR considered. These impacts will not be addressed in the Draft SEIR.

XII. NOISE	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-d) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse impacts associated with noise were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in a less than significant impact to the sensitive receptors due to vehicular traffic noise with the implementation of mitigation measures.

However, there is a potential for the implementation of reduction measures in the GHG Plan to have further noise impacts. The siting of new renewable energy generating facilities and

supporting facilities (e.g., reduction measure “Renewable Portfolio Standard”) may generate excessive noise from construction and operation, as well as from roadway and transit improvements (e.g., reduction measures “Roadway Improvements including Signal Synchronization and Traffic Flow Management” and “Public Transit Measures”). Therefore, these new impacts will be addressed in the Draft SEIR.

e-f) Less Than Significant or No Impact.

Adverse impacts associated with airport noise were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would result in a less than significant impact to the sensitive receptors due to airport noise with the implementation of mitigation measures

The GHG Plan would not alter land uses in the vicinity of public or private airports that could expose people to airport noise. This issue will not be addressed in the Draft SEIR.

XIII. POPULATION AND HOUSING	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a-c) Impact Adequately Addressed in Program EIR. Adverse impacts associated with noise were addressed in the previous environmental documents prepared for the GP EIR, which found that an increase in population and housing in the County will result in a less than significant impact to the with the implementation of mitigation measures.

The GHG Plan does not result in any new development, changes in population, potential or construction of facilities that would propose land use changes beyond what the GP EIR considered. This issue will not be address in the Draft SEIR.

IV. PUBLIC SERVICES	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project result in:				
Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR.

Adverse effects related to fire protection services were addressed in the previous environmental documents prepared for the GP EIR, which found that development under the General Plan will result in growth and development in the unincorporated communities of San Bernardino County that will result in an increase in demand for fire protection services and this impact can be reduced to less than significant with mitigation.

Nevertheless, reduction measures under The GHG Plan could trigger additional fire protection services beyond what was considered in the General Plan EIR. This impact will be addressed in the Draft SEIR.

b-e) Impact Adequately Addressed in Program EIR. Adverse effects related to law enforcement services, public schools, parks and other governmental services were addressed in the previous environmental documents prepared for the GP EIR, which found that development under the General Plan will result in an increase in population and human activity in the area and will result in an increase in the need for law enforcement services and this impact can be reduced to less than significant with mitigation.

The GHG Plan does not result in any new development potential, population increase, or construction of facilities that would propose land use changes beyond what the GP EIR considered that would trigger additional or altered need for these public services. These impacts will not be addressed in the Draft SEIR.

XV. RECREATION	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a, b) Less Than Significant or No Impact. Adverse impacts associated with development allowed under the General Plan were addressed in the GP EIR, which found that this impact may result in the need to add more park space and recreational trails to serve the project. The GP EIR found this impact can be fully mitigated.

The GHG Plan does not result in any new development potential, population increase, or construction of facilities that would result in recreation facility or service impacts. These impacts will not be addressed in the Draft SEIR.

XVI. TRANSPORTATION/TRAFFIC	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) 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 and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION

a and b) Impact Adequately Addressed in Program EIR. Adverse impacts associated with traffic performance standards and policies were addressed in the GP EIR, which found that the General Plan may result in roadway operations at LOS E or F in the Valley or Mountain Regions, or at LOS D, E, or F in the Desert Region. The GP EIR found this impact can be fully mitigated.

The GHG Plan does not result in any new development potential or construction of facilities that would propose land use changes beyond what the GP EIR considered that would generate substantial new traffic. Additionally, implementation of the GHG Plan reduction measures will promote the reduction of vehicle miles traveled (e.g., reduction measures “Employment Based Trip and VMT Reductions Policy” and “Bicycle/Pedestrian Infrastructure and Promotion”) will thereby reducing traffic impacts, which is a beneficial impact. This impact will not be addressed in the Draft SEIR.

c) Less Than Significant or No Impact. Adverse impacts associated with additional demand at Ontario International Airport and an increase in demand for air freight services will also result in increased air traffic levels at the Southern California Logistics Airport and San Bernardino International Airport were addressed in the GP EIR, which found these impacts could be reduced to less than significant with mitigation.

The GHG Plan does not result in any new development potential or construction of facilities that would propose land use changes that would alter air traffic patterns. This impact will not be addressed in the Draft SEIR.

d) Impact Adequately Addressed in Program EIR. Adverse impacts associated with potentially increasing hazardous conditions on roadways were addressed in the environmental documents prepared for the GP EIR, which found these impacts could be reduced to less than significant with mitigation.

The GHG Reduction Plan does not result in any new development potential or construction of facilities that would propose land use changes that are expected to alter roadway designs that would increase hazards. All roadway improvements under the reduction measures would still be subject to County roadway design standards. This impact will not be addressed in the Draft SEIR.

e) Impact Adequately Addressed in Program EIR. Adverse impacts associated with potentially emergency access were addressed in the environmental documents prepared for the GP EIR, which found these impacts could be reduced to less than significant with mitigation.

The GHG Plan does not result in any new development potential or construction of facilities that would increase these types of hazardous conditions beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all local, state and federal policies and standards regarding emergency response and evacuation plans. This impact will not be addressed in the Draft SEIR.

f) Impact Adequately Addressed in Program EIR. Adverse impacts associated with proposed land uses conflicting with transit, bicycle or pedestrian facilities were addressed in the environmental documents prepared for the GP EIR, which found these impacts could be reduced to less than significant with mitigation.

The GHG Plan does not result in any new development potential or construction of facilities that would propose land use changes beyond what the GP EIR considered that would conflict with

INITIAL ENVIRONMENTAL STUDY

transit, bicycle or pedestrian facilities. Additionally, implementation of the GHG Plan reduction measures will promote transit, pedestrian and bicycle uses (e.g., reduction measures "Public Transit Measures" and "Bicycle/Pedestrian Infrastructure and Promotion") will thereby reducing traffic impacts, which is a beneficial impact. This impact will not be addressed in the Draft SEIR.

XVII. UTILITIES AND SERVICE SYSTEMS	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: County of San Bernardino General Plan Program EIR

DISCUSSION/CONCLUSION/MITIGATION

a) Impact Adequately Addressed in Program EIR. Adverse impacts associated with violating water quality standards were addressed in the environmental documents prepared for the GP EIR, which found these impacts could be reduced to less than significant with mitigation.

The GHG Reduction Plan does not result in any new development potential or construction of facilities that would violate water quality standards beyond what the GP EIR considered. Implementation of projects and activities under the GHG Plan would be subject to all of the County development standards regarding water quality. These impacts will not be addressed in the Draft SEIR.

b-e) Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR. Adverse effects related to the requirement of new water, wastewater treatment facilities or storm drain facilities were addressed in the previous environmental documents prepared for the GP EIR, which found that development of the plan area would require the construction of new water, wastewater treatment facilities or storm drain facilities or expansion of existing facilities, the construction of which could cause significant environmental effects, but the impacts can be reduced to below a level of significance with mitigation.

Nevertheless, implementation of the GHG Plan reduction measures could require the construction of additional water supply as well as additional water, wastewater, drainage and other utility facilities not previously considered in the General Plan EIR. These new impacts will be addressed in the Draft SEIR.

f and g) Less Than Significant or No Impact. Adverse impacts associated with solid waste generation were addressed in the environmental documents prepared for the GP EIR, which found these impacts could be reduced to less than significant with mitigation.

The GHG Plan includes reduction measures that would further reduce solid waste generation consistent with local, state and federal regulations. This includes reduction measure, County Diversion Programs – 75 Percent Goal. These impacts will not be addressed in the Draft SEIR.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE	Potentially New or Increased Severity of a Significant Impact Not Addressed in Program EIR	Less Than Significant Impact Due to Project Measures	Impact Adequately Addressed in Program EIR	Less Than Significant or No Impact
Does the project:				
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DISCUSSION/CONCLUSION

As noted in the above checklist discussion, the proposed GHG Plan does have the potential to result in project and cumulative impacts to biological resources, cultural resources as well as to human beings. The Draft SEIR will further address these issues.

REFERENCES

San Bernardino County General Plan, March 13, 2007

GP EIR Draft EIR, September 2006

GP EIR Final EIR, February 2007

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DRAFT



September 28, 2010

Via Electronic Mail

County of San Bernardino
Land Use Services Department
ATTN: Doug Feremenga, Associate Planner
Land Use Services Department
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415
dferemenga@lud.sbcounty.gov

RE: Comments by Center for Biological Diversity on Notice of Preparation of Draft Supplement to County of San Bernardino General Plan Program Environmental Impact Report for the Proposed Countywide Greenhouse Gas (GHG) Emissions General Plan Amendment, GHG Reduction Plan and Development Code Amendments

Dear Mr. Feremenga:

These comments are submitted on behalf of the Center for Biological Diversity (“Center”) on the Notice of Preparation of Draft Supplement to County of San Bernardino General Plan Program Environmental Impact Report for the Proposed Countywide Greenhouse Gas (GHG) Emissions General Plan Amendment, GHG Reduction Plan and Development Code Amendments (“NOP”). We appreciate the County’s efforts to develop a GHG Reduction Plan for the County. To ensure the Plan is effective and useful for purposes of streamlining environmental review under CEQA, please consider the following.

Set a Per Capita Reduction Target

In setting a threshold of significance for GHGs from a General Plan, the Bay Area Air Quality Management District (BAAQMD) has recommended a 2020 per capita objective of 6.6 metric tons for the applicable service population (residents + employees). In its most recent proposal, the South Coast Air Quality Management District (SCAQMD) has recommended the same target. In determining whether the GHG Reduction Plan functions to reduce emissions from activities covered under the plan to below a level of significance, please assess the Plan’s effect in reducing per capita emissions.

In addition, as the General Plan extends beyond 2020, the per capita target should be reduced consistent with California’s 2050 emission reduction objectives. As noted in

the AB 31 Scoping Plan, per capita emissions must decrease at an average rate of slightly less than 5 percent per year during the 2020 to 2030 period. (Scoping Plan at 118.)

Ensure that Mitigation Measures are Specific and Enforceable

As recently set forth by the Court of Appeal in *Communities for a Better Environment v. City of Richmond*, “the novelty of greenhouse gas mitigation measures is one of the most important reasons ‘that mitigation measures timely be set forth, that environmental information be complete and relevant, and that environmental decisions be made in an accountable arena.’” 184 Cal.App.4th 70, 96 (2010) (citation omitted). Please ensure that mitigation measures in the GHG Reduction Plan are specific, enforceable and that their benefits are quantified where feasible.

Develop a Broad Range of Mitigation Measures to Address All Aspects of the County’s Carbon Footprint

Potential measures identified in the NOP are a good start but more measures should be considered and incorporated into the GHG Reduction Plan. The Attorney General’s Office has compiled a list of resources and model policies to address climate change in general plans. (Attorney General, Sustainability and General Plans: Examples of Policies to Address Climate Change, Jan. 22, 2010, available at http://ag.ca.gov/globalwarming/pdf/GP_policies.pdf.) In addition, CAPCOA has identified a range of potential measures in its guidance documents, *Model Policies for GHGs in General Plans* and *Quantifying GHG Mitigation Measures* that the County should consider. As transportation related emissions are a significant source of emissions in the County, the County should adopt robust additional measures that reduce VMT by promoting infill and mixed uses and discourage suburban sprawl.

Thank you for considering these comments. We look forward to working with the County in its development of its GHG Reduction Plan. If you have any questions, please contact Matt Vespa, mvespa@biologicaldiversity.org, (415) 436-9682 x309.

Please ensure that we are notified of any future action on this Project.

Sincerely,



Matthew Vespa
Senior Attorney



California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
<http://www.dfg.ca.gov>
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-200
Ontario, CA 91764
(909) 484-0167

ARNOLD SCHWARZENEGGER, Governor
JOHN McCAMMAN, Director



October 14, 2010

Doug Feremenga
San Bernardino County Land Use Services Department
285 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0043

Re: Notice of Preparation of a Supplemental Environmental Impact Report
Countywide Greenhouse Gas Emissions Reduction Plan
SCH No. 2005101038

Dear Mr. Feremenga:

The Department of Fish and Game (Department) appreciates this opportunity to comment on the Notice of Preparation for the General Plan Amendment Draft Supplemental Environmental Impact Report (DEIR) for the Countywide Greenhouse Gas (GHG) Emissions Reduction Plan. The project is located in the County of San Bernardino and involves the Greenhouse Gas Reduction Plan that will include inventories, a reduction target, and reduction measures to meet the reduction target.

The Department is responding as a Trustee Agency for fish and wildlife resources [Fish and Game Code Sections 711.7 and 1802 and the California Environmental Quality Act (CEQA) Guidelines Section 15386], and as a Responsible Agency regarding any discretionary actions (CEQA Guidelines Section 15381), such as a Lake or Streambed Alteration Agreement (California Fish and Game Code Sections 1600 *et seq.*) and/or a California Endangered Species Act (CESA) Permit (California Fish and Game Code Sections 2080 and 2080.1).

The Initial Study states that the plan may have potential adverse impacts to biological resources from the siting of new energy generating facilities. Because the locations of new facilities are not known specific impact analyses and mitigation measures to offset these impacts are not proposed. This document can suggest general mitigation measures, however, new facilities will have to be processed through the California Environmental Quality Act and may require a 1600 Lake or Streambed Alteration Agreement or California Endangered Species Act incidental take permit.

The Department has the following recommendations, in addition to the recommendations in the later portion of this letter and requests that these issues be addressed in the CEQA document.

Conserving California's Wildlife Since 1870

Provide a complete project description that lists all the activities covered by this project, including on- and off-site development;

1. Any biological assessments or focus surveys be conducted within one year of the distribution of the CEQA Document;
2. Any biological reports should be included in the CEQA Document;
3. A jurisdictional delineation of State waters should be included in the CEQA Document, if warranted;
4. Sensitive plant surveys should be conducted according to the Department's November 2009 guidance for Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities.

The Department advises that any biological habitat assessments or walkovers be conducted within a year of distribution of the CEQA document. Habitat assessments that identify the possibility of listed threatened or endangered plants should also provide the results of any focus surveys in the CEQA document. CEQA documents that rely on future surveys or regulatory compliance (with the exception of pre-construction surveys for burrowing owls or bird nests) as mitigation may not satisfy the Department's obligations under CEQA and may require future supplemental documents processed via CEQA.

The existing condition of the project site designated in the CEQA document as "degraded" or "agriculture use" by the lead agency does not preclude the presence of native species, such as grassland species, the burrowing owl, foraging raptors, or riparian species. A basic biological resources survey should still be conducted at these sites and the results included in the CEQA document.

The Department is concerned about the continuing loss of jurisdictional waters of the State and the encroachment of development into areas with native habitat values. The DEIR should contain sufficient, specific, and current biological information on the existing habitat and species at the project site; measures to minimize and avoid sensitive biological resources; and mitigation measures to offset the loss of native flora and fauna and State waters. If the project site contains Federally- or State-listed species, the DEIR should include measures to avoid and minimize impacts to these species as well as mitigation measures to compensate for the loss of biological resources. The DEIR should not defer impact analysis and mitigation measures to future regulatory discretionary actions, such as a Lake or Streambed Alteration Agreement, CESA Permit, or Federal Endangered Species Act (ESA) Permit.

This particular project has the potential to have significant environmental impacts on sensitive flora and fauna resources, including Federally- and State-listed endangered species. Therefore, the DEIR should include an alternatives analysis which focuses on environmental resources and ways to avoid or minimize impacts to those resources.

To enable Department staff to adequately review and comment on the proposed project, we suggest that updated biological studies be conducted prior to any environmental or discretionary approvals. The following information should be included in any focused biological report or supplemental environmental report:

1. A complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats.
 - a. A thorough assessment of rare plants and rare natural communities, following the Department's November 2009 guidance for Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. The guidance document can be found at the following link:
[http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols for Surveying and Evaluating Impacts.pdf](http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols%20for%20Surveying%20and%20Evaluating%20Impacts.pdf)
 - b. A complete assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be considered. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and the U.S. Fish and Wildlife Service.
 - c. Rare, threatened, and endangered species to be addressed should include all those which meet the CEQA definition (See CEQA Guidelines, 15380)
 - d. The Department's California Natural Diversity Data Base in Sacramento should be contacted at (916) 327-5960 to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the California Fish and Game Code.
2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts.
 - a. CEQA Guidelines, 15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region, such as Riversidean sage scrub, coastal sage scrub, Riversidean alluvial fan sage scrub, riparian habitat, listed species and species of special concern.
 - b. Project impacts should be analyzed relative to their affects on off-site habitats. Specifically, this should encompass adjacent public lands, open space, adjacent natural habitats, and riparian ecosystems. In addition, impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas, should be fully evaluated and provided.

- c. The zoning of areas for development projects or other uses that are nearby or adjacent to natural areas may inadvertently contribute to wildlife-human interactions. A discussion of possible conflicts and mitigation measures to reduce these conflicts should be included in the environmental document.
 - d. A cumulative effects analysis should be developed as described under CEQA Guidelines, 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.
 - e. The document should include an analysis of the effect that the project may have on the adjacent Western Riverside Multiple Species Habitat Conservation Plan or on other regional and/or subregional conservation programs or Habitat Conservation Plans. Under Sections 2800-2835 of the California Fish and Game Code, the Department, through the Natural Communities Conservation Planning (NCCP) program is coordinating with local jurisdictions, landowners, and the Federal Government to preserve local and regional biological diversity.
3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated (CEQA Guidelines 15126.6). A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.
 - a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid and/or otherwise minimize project impacts. Off-site compensation for unavoidable impacts through acquisition and protection of high-quality habitat should be addressed.
 - b. The Department considers Rare Natural Communities as threatened habitats having both local and regional significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts. These habitats include but are not limited to Riversidean alluvial fan sage scrub, coastal sage scrub and riparian habitat.
 - c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.
4. A CESA Permit must be obtained, if the project has the potential to result in "take" of species of plants or animals listed under CESA, either during construction or over the life of the project. CESA Permits are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to the

proposed project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the California Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested:

- a. Biological mitigation, monitoring, and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.
 - b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.
5. The Department opposes the elimination of watercourses and/or their channelization or conversion to subsurface drains. All wetlands and watercourses, whether intermittent or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.
- a. Under Section 1600 *et seq.* of the California Fish and Game Code, the Department requires the project applicant to notify the Department of any activity that will divert, obstruct or change the natural flow or the bed, channel or bank (which includes associated riparian resources) of a river, stream or lake, or use material from a streambed prior to the applicant's commencement of the activity. Streams include, but are not limited to, intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams, and watercourses with subsurface flow. The Department's issuance of a Lake and Streambed Alteration Agreement for a project this is subject to CEQA will require CEQA compliance actions by the Department as a responsible agency. The Department, as a responsible agency under CEQA, may consider the local jurisdiction's (lead agency) Negative Declaration or Environmental Impact Report for the project. However, if the CEQA document does not fully identify potential impacts to lakes, streams, and associated resources (including, but not limited to riparian and alluvial fan sage scrub habitat) and provide adequate avoidance, mitigation, monitoring, and reporting commitments, additional CEQA documentation will be required prior to execution (signing) of the Streambed Alteration Agreement. In order to avoid delays or repetition of the CEQA process, potential impacts to a lake or stream, as well as avoidance and mitigation measures need to be discussed within this CEQA document. The Department recommends the following measures to avoid subsequent CEQA documentation and project delays:
 - (i) Incorporate all information regarding impacts to lakes, streams and associated habitat within the DEIR. Information that should be included within this document includes: (a) a delineation

of lakes, streams, and associated habitat that will be directly or indirectly impacted by the proposed project; (b) details on the biological resources (flora and fauna) associated with the lakes and/or streams; (c) identification of the presence or absence of sensitive plants, animals, or natural communities; (d) a discussion of environmental alternatives; (e) a discussion of avoidance measures to reduce project impacts, (f) a discussion of potential mitigation measures required to reduce the project impacts to a level of insignificance; and (g) an analysis of impacts to habitat caused by a change in the flow of water across the site. The applicant and lead agency should keep in mind that the State also has a policy of no net loss of wetlands.

(ii) The Department recommends that the project applicant and/or lead agency consult with the Department to discuss potential project impacts and avoidance and mitigation measures. Early consultation with the Department is recommended since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. To obtain a Streambed Alteration Agreement Notification package, please visit our website at: <http://www.dfg.ca.gov/habcon/1600/> or call (562) 430-7924.

Thank you for this opportunity to comment. Please contact Robin Maloney-Rames at (909) 980-3818, if you have any questions regarding this letter.

Sincerely,



Robin Maloney-Rames
Environmental Scientist

cc: State Clearinghouse, Sacramento

Jolene Miller

From: Michael Massimini [mmassimini@barstowca.org]
Sent: Wednesday, September 29, 2010 11:27 AM
To: Feremenga, Douglas - LUS
Cc: Ron Rector
Subject: General Plan Amendment & Countywide Greenhouse Gas (GHG) Emission Reduction Plan/IS

Dear Mr. Feremenga,

Unfortunately we have a prior engagement and cannot attend the workshop on the GPA/GHG Emission Reduction Plan today. However, we would like an opportunity to point out some minor typographical corrections that may be necessary to the IS. A copy of the IS will be sent via the U.S. Postal Service as the scanned document is too large to email. As indicated, the comments are minor.

A concern that we have pertains to the two sections addressing water quality (Hydrology and Water Quality) and water (Utilities and Service Systems), is the discussion that there could be a need for new water systems as a part of the GHG Plan. If this is a result of solar and other energy producing facilities, is there a preference towards photovoltaic, concentrated photovoltaic, or other water conserving energy production? Some solar energy systems contaminate water to where they cannot be discharged back into the aquifer without extensive filtering. Photovoltaic uses water for occasional cleaning, with many detergents being biodegradable. Also, some conventional electric production systems require an extensive supply of water for cooling purposes and again, cannot be discharged back into the aquifer without extensive filtering. As you are aware, water and water quality is an issue due to the depleting groundwater supply. Any such project that uses large quantities of water should clean the water and discharge back into the aquifer to mitigate this impact.

We look forward to reviewing the Draft SEIR upon its availability. You may send a copy to me at the address below or electronically via email.

Sincerely,

Michael Massimini
City Planner
City of Barstow
220 E. Mt. View St. Ste. A
Barstow, CA 92311
(760) 255-5152 (phone)
(760) 256-1750 (fax)



San Bernardino Mountains Group

San Gorgonio Chapter

PO Box 708
Blue Jay, CA 92317

www.sangorgonio.sierraclub.org/mountains/

October 20, 2010
County of San Bernardino
Land Use Services Department, Advance Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA, 92415-0182
Attn: Doug Feremenga

Re: Notice of Preparation for a Supplemental Environmental Impact Report (SEIR) for a Bernardino County Proposed General Plan Amendment and Countywide Greenhouse Gas (GHG) Emissions Reduction Plan

Dear Mr. Feremenga,

As someone who was unable to attend the County's September 29, 2010 GHG Reduction Plan workshop, the first and only opportunity for the public to hear anything about the details of this project since it was first announced in August of 2007 as part of a settlement with the state Attorney General's office, I am constrained by a significant lack of information regarding the specifics of this project. The only detailed information I have available to me is from the project's NOP DVD which includes the Initial Study, a notice of the September workshop, and the 8 or so pages of very abbreviated and generic descriptions of potential emission policy areas that might or might not be considered for the final Plan. I note that other than the three documents described above (the NOP, Initial Study and the workshop announcement) there is no additional information or disclosures posted on the County website and accessible by the public regarding the Draft GHG Plan or General Plan amendments being considered.

I am frankly frustrated about my ability to cogently comment on the adequacy or accuracy of the proposed General Plan Amendment(s), the GHG Emissions Reduction Plan or the publicly distributed Initial Environmental Study because there are so few specifics.

That being said, I submit the following comments and observations:

- 1) I strongly believe that the GHG Plan SEIR should be evaluating the impacts of potential Land Use and zoning changes. If development in the County is to consider the impacts of siting homes and business with respect to vehicle mileage (as is strongly suggested in the state's SB375 recommendations, zoning and population clusters are very likely to change within the County. This contradicts the conclusions of the Initial Study. (See Land Use impacts)
- 2) In the Initial Study (p. 27) Population and Housing impacts is erroneously analyzed as being concerned about "noise" impacts. Further as in the above, development and residential policies that favor less VMT (higher densities, less sprawl, more integrated business and residential) will inevitably have potentially significant impacts on growth in ways that were NOT addressed in the 2007 GP EIR since GHG policies were not considered in the original GP.
- 3) Although the Plan implies there will be metrics associated with GHG policies, they are not available here. It will be important to establish accurate and believable metrics for each policy being proposed both for the success of the Plan and the completeness of the SEIR. If the 2020 Reduction goals are not realistic, the environmental impact of this Plan is significant: climate change is exacerbated.

There appears to be no intention of evaluating the reliability or accuracy of the intended outcomes. It is important (for the GP Plan and policies themselves) to include a review of the progress and success of the proposed Plan to see where and how well the 2020 goals are being met. If the Plan does not include a way for the County leadership or the public to "correct" itself, the Plan is insufficient and needs to be expanded to include mandated and specific periodic review.

- 4) There should be an extensive matrix of "alternative" approaches to achieve the GHG Emissions Reductions. One notices that the R3 policies are not being considered as required to meet the 2020 goals. Yet, without much greater specifics as to the eventual elements of the proposed Plan, no one should rely on the premature assumptions that the R3 policies are not, or will not be required. Alternative approaches should be a requirement for both the Plan itself and as a robust exploration for CEQA review of alternative Plan "projects".

Thank you for your attention.

Sincerely,

Steven Farrell
Sierra Club, San Bernardino Mountains Group

COMMENT CARD
San Bernardino County Planning Department
GHG Reduction Plan SEIR
Scoping Session
September 29, 2010

Name: Sue Walker

Affiliation: Mts. Grp of Sierra Club

Address: P.O. Box 94
Lake Arrowhead

Comments: Need more specificity
in the plan. For example
transportation should be broken
down by on-road vehicles; off
road vehicles; air transportation;
rail transportation.

Susan V Walker

Written comments must be received no later than October 20, 2010 at the following address:

County of San Bernardino, Land Use Services Department
ATTN: Doug Feremenga, Associate Planner
385 N. Arrowhead Ave., First Floor San Bernardino, CA 92415

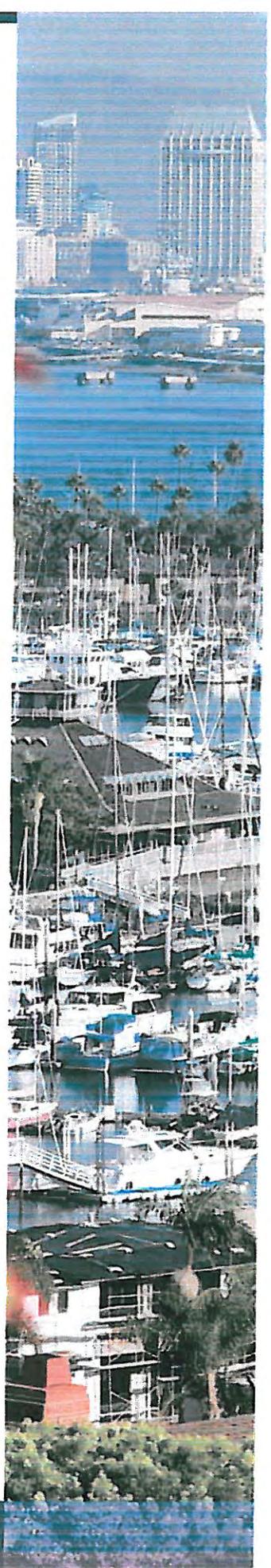
Key Findings

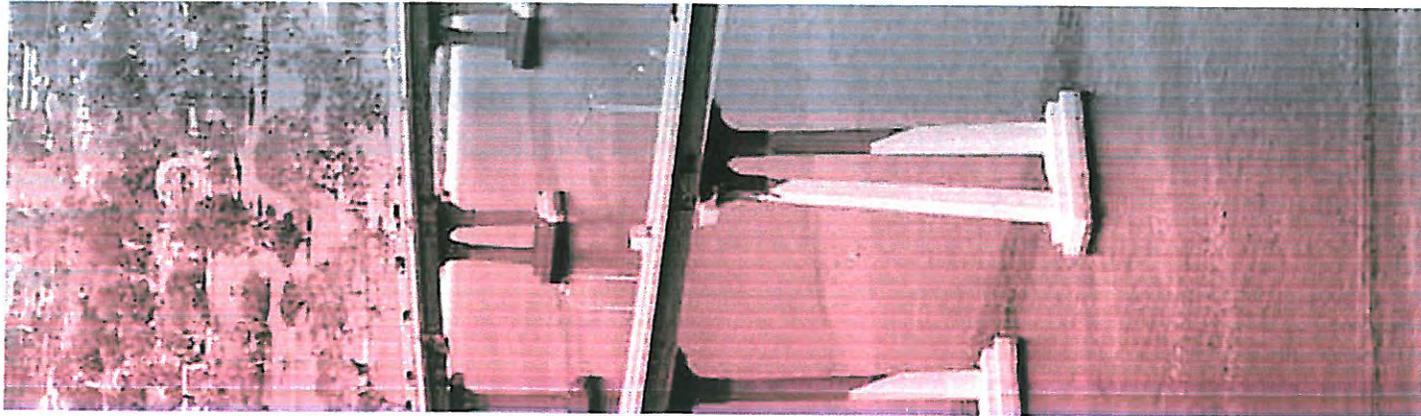
San Diego County

- San Diego County emitted 34 million metric tons of carbon dioxide equivalent (MMT CO₂E) in 2006 – an 18% increase over 1990 levels, commensurate with population growth during the same period.
- In 2006, per-capita emissions for San Diego County were 12 metric tons CO₂E, which is slightly lower than California as a whole (13) and significantly lower than the U.S. levels (24).
- In 2006, emissions from cars and light-duty trucks represented 46% of total greenhouse gas emissions in San Diego County.
- By 2020, under a business-as-usual scenario, regional greenhouse gas emissions are expected to be 43 MMT CO₂E, an increase of 9 MMT CO₂E (26%) over 2006 levels and 14 MMT CO₂E (48%) over 1990 levels.
- To meet AB 32 emissions reduction targets (1990 levels by 2020), San Diego County would have to reduce emissions by 14 MMT CO₂E (33%) below projected business-as-usual levels in 2020.
- Nearly 60% of total regional emissions are associated with individuals (e.g., passenger vehicles, light-duty trucks, residential electricity and natural gas consumption).
- San Diego County likely can reduce its greenhouse gas emissions to 1990 levels by 2020 through a combination of reduction strategies from all sectors. This study estimates that through a combination of 21 strategies, the region could reduce its emissions by 15 MMT CO₂E by 2020, more than the quantity required to reach 1990 levels.
- In the scenario above, reductions from the on-road transportation sector (7 MMT CO₂E) and the electricity sector (5 MMT CO₂E) represent 81% of total reductions.
- Two statewide policies would account for 41% of these greenhouse gas emissions reductions. Implementing the Pavely (AB 1493) vehicle emissions standards by 2020 would reduce emissions by just over 3 MMT CO₂E, 21% of total reductions, and implementing a 33% renewable portfolio standard by 2020 would reduce emissions by 3 MMT CO₂E, 19% of total reductions.

Report Overview

This study developed a greenhouse gas inventory for San Diego County to better understand the emissions sources in the region and to serve as a resource for local and regional decision makers as they consider ways to reduce emissions at the local and regional levels. To that end, the project team calculated historical greenhouse gas emissions from 1990 to 2006 using the best available data, and then estimated future emissions to 2020 for San Diego County. Using emissions reduction targets codified in California's Global Warming Solutions Act of 2006 (AB 32) as a guide, the study also sought to establish emissions reductions targets for the region. Although AB 32 does not require individual sectors or jurisdictions (e.g., cities and counties) to reduce emissions





CIVIL AVIATION

- Interstate Flights
- Intrastate Flights

ELECTRICITY

- Residential
- Commercial
- Industrial
- Mining
- Agricultural
- Telephone, communications, utilities (TCU)
- Street Lighting

DEVELOPMENT

- Loss of farmland
- Loss of native vegetation

INDUSTRIAL PROCESSES AND PRODUCTS

- HFC refrigerants
- Sulfur hexafluoride
- Other

NATURAL GAS END USES

- Residential
- Commercial
- Industrial
- Mining
- Agricultural

OFF-ROAD EQUIPMENT AND VEHICLES

- Construction and Mining Equipment
- Pleasure Craft
- Industrial Equipment
- Agriculture Equipment
- Other

Motorcycle

OTHER FUELS/OTHER

- Manufacturing
- Transport
- Residential
- Commercial
- Non-Specified
- Agriculture
- Cogeneration
- Thermal Emissions

RAIL TRANSPORTATION

SEQUESTRATION FROM LAND COVER

- Forest growth
- Woodland growth
- Chaparral, scrub, and grasslands

WASTE

- Landfills
- Wastewater Treatment

WATER-BORNE NAVIGATION

- Ocean Going Vessels (OGV)
- Harbor Craft

WILDFIRES

- Forest
- Woodlands
- Chaparral, scrub, and grasslands



which was promulgated in Executive Order S-01-07, would reduce the carbon intensity of transportation fuels sold in California by 10% by 2020.¹² Applying this standard to fuels used by on-road vehicles would reduce greenhouse gas emissions by 11%. Reduction in vehicle miles traveled and increased vehicle efficiency measures make up the final transportation wedges.

While many of the strategies identified here are based in state and federal law, there is a significant role for local governments in realizing emissions reductions. While local governments can help to facilitate statewide standards like the renewable portfolio standard, they can play a more direct role in locally and regionally based strategies. Strategies include reducing vehicle miles traveled, electricity and natural gas consumption, increasing use of distributed energy resources such as cogeneration and photovoltaics, and capturing more methane gas at our region's landfills.

Conclusion

San Diego County emitted 34 million MMT CO₂E in 2006—an 18% increase over 1990 levels. This increase is commensurate with the increase in county population and statewide trends over the same period. On-road transportation, mainly cars and light-duty trucks, was responsible for 16 MMT CO₂E in 2006, 46% of total greenhouse gas emissions in San Diego County for that year, and was by far the largest emitting category of the inventory. The electricity category emitted 7 MMT CO₂E (25%) and natural gas end-use emitted 3 MMT CO₂E (9%). These top three emitting categories are significantly associated with activities by individuals (e.g., driving and home electricity and natural gas use); thus nearly 60% of total regional emissions are associated with individual activities.

By 2020, under a business-as-usual scenario, regional greenhouse gas emissions are expected to be 43 MMT CO₂E, increase of 8.52 MMT CO₂E (26%) over 2006 levels. Even though AB 32 does not specify reduction targets for counties, to achieve its emissions reduction targets (1990 levels by 2020), San Diego County would have to reduce emissions by 14 MMT CO₂E (30%) below projected business-as-usual levels in 2020. San Diego County can reduce its greenhouse gas emissions to 1990 levels by 2020 through a combination of reductions strategies from all sectors, mainly driven by renewable energy mandates, fuel efficiency standards, and a low-carbon fuel standard. This study estimates that through a combination of 21 strategies, the region could reduce its emissions by 15 MMT CO₂E by 2020, slightly more than required to reach 1990 levels.

Clearly, meeting the greenhouse gas emissions targets of AB 32 targets will involve the entire state, and actions taken on a multi-county or regional basis may well influence the contributions made by or needed from San Diego County. A detailed analysis of the local and regional policy changes necessary to achieve the potential emissions reductions presented here was beyond the purview of this report, but will be addressed in the next phase of the project.

12. Go to <http://gov.ca.gov/index.php?executive-order/5172/>

	1990	1995	2000	2005	2010	2015	2020
ON-ROAD TRANSPORTATION							
Passenger Vehicles	7.4	6.5	6.3	6.2	6.5	6.6	7.3
Light Duty Trucks	5.1	5.1	5.9	7.8	8.5	8.4	9.4
Heavy Duty Trucks and Vehicles	1.8	1.6	1.7	1.9	1.9	2.0	2.3
Motorcycle	0.04	0.03	0.02	0.1	0.1	0.1	0.1
ELECTRICITY	6.5	7.2	8.0	8.3	9.4	10	11
Residential	2.4	2.6	2.7	2.9	3.4	3.6	3.9
Commercial	2.6	2.9	3.6	3.7	4.3	4.7	5.2
Industrial	0.7	0.7	0.8	0.7	0.7	0.7	0.7
Mining	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Agricultural	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TCU	0.6	0.7	0.7	0.7	0.8	0.9	0.9
Street Lighting	0.03	0.04	0.04	0.04	0.05	0.1	0.1
NATURAL GAS END USES	3.0	2.8	2.6	2.9	3.2	3.4	3.6
Residential	1.8	1.7	1.8	1.7	1.9	2.0	2.1
Commercial	0.7	0.7	0.5	0.9	1.0	1.1	1.2
Industrial	0.4	0.3	0.2	0.1	0.2	0.2	0.2
Mining	0.04	0.02	0.01	0.03	0.03	0.03	0.03
Agricultural	0.03	0.03	0.02	0.03	0.03	0.03	0.03
OFF-ROAD EQUIPMENT AND VEHICLES	1.0	1.0	1.2	1.3	1.4	1.5	1.6
Construction and Mining Equipment	0.4	0.5	0.6	0.6	0.7	0.7	0.8
Pleasure Craft	0.1	0.1	0.1	0.2	0.2	0.2	0.3
Industrial Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Agriculture Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other	0.2	0.2	0.3	0.3	0.3	0.3	0.4
CIVIL AVIATION	1	1	2	2	2	2	3
Interstate	1.0	1.1	1.4	1.7	1.8	1.9	2.1
Intrastate	0.2	0.2	0.2	0.2	0.2	0.2	0.2
WASTE	0.9	1.1	0.5	0.4	0.7	0.8	0.9
Landfills	0.3	0.5	0.2	0.2	0.4	0.5	0.6
Wastewater Treatment	0.6	0.6	0.3	0.1	0.2	0.2	0.2
INDUSTRIAL PROCESSES AND PRODUCTS	0.5	0.7	1.2	1.6	2.0	2.4	2.8
HFC Refrigerants	0.003	0.3	0.8	1.2	1.6	2.0	2.5
Sulfur Hexafluoride	0.2	0.1	0.1	0.1	0.05	0.03	0.02
Other	0.3	0.2	0.3	0.3	0.3	0.3	0.3
WATER-BORNE NAVIGATION	0.04	0.1	0.1	0.1	0.1	0.2	0.2
Ocean Going Vessels (OGV)	0.03	0.0	0.1	0.1	0.1	0.1	0.1
Harbor Craft	0.01	0.01	0.02	0.02	0.03	0.03	0.04
RAIL TRANSPORTATION	0.2	0.2	0.3	0.3	0.3	0.4	0.4
OTHER/OTHER FUELS	1.6	1.4	1.5	1.3	1.2	1.2	1.2
Manufacturing	0.7	0.5	0.7	0.6	0.7	0.7	0.7
Transport	0.2	0.1	0.04	0.1	0.1	0.1	0.1
Non-Specified	0.04	0.04	0.1	0.1	0.1	0.1	0.2



COMMENT CARD
San Bernardino County Planning Department
GHG Reduction Plan SEIR
Scoping Session
September 29, 2010

Name: Tom Hall

Affiliation: San Bernardino National Forest

Address: 602 S. Tippecanoe Ave.
San Bernardino, CA 92408

Comments: Please notify me if actions will
supersede USDA Forest Service management
on National Forest System lands.

Written comments must be received no later than October 20, 2010 at the following address:
County of San Bernardino, Land Use Services Department
ATTN: Doug Feremenga, Associate Planner
385 N. Arrowhead Ave., First Floor San Bernardino, CA 92415



South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

October 19, 2010

Mr. Doug Feremenga, Associate Planner
Land Use Services Department
County of San Bernardino
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415

Notice of Preparation of a Draft Environmental Impact Report (Draft EIR) for the Greenhouse Gas Emissions Reduction Plan

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft environmental impact report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to the SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address in our letterhead. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files. These include original emission calculation spreadsheets and modeling files (not Adobe PDF files). Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2007 Model. This model is available on the SCAQMD Website at: www.urbemis.com.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM_{2.5} emissions from construction and operational activities and processes. In connection with developing PM_{2.5} calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM_{2.5} emissions and compare the results to the recommended PM_{2.5} significance thresholds. Guidance for calculating PM_{2.5} emissions and PM_{2.5} significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at <http://www.aqmd.gov/ceqa/handbook/LST/LST.html>.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA web pages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

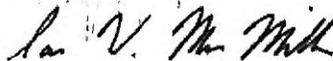
In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: <http://www.aqmd.gov/prdas/aqguide/aqguide.html>. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: <http://www.arb.ca.gov/ch/handbook.pdf>. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (<http://www.aqmd.gov>).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. If you have any questions regarding this letter, please call Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244.

Sincerely,



Ian MacMillan

Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources



Arnold Schwarzenegger
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit



Cathleen Cox
Acting Director

Notice of Preparation

September 20, 2010

RECEIVED
SEP 21 2010
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

To: Reviewing Agencies

Re: Supplement to the County of San Bernardino General Plan Program SEIR for the Proposed Countywide Greenhouse Gas (GHG) Emissions General Plan Amendment and Reduc
SCH# 2005101038

Attached for your review and comment is the Notice of Preparation (NOP) for the Supplement to the County of San Bernardino General Plan Program SEIR for the Proposed Countywide Greenhouse Gas (GHG) Emissions General Plan Amendment and Reduc draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Doug Feremenga
San Bernardino County Land Use Services Department
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0043

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

**Document Details Report
State Clearinghouse Data Base**

SCH# 2005101038

Project Title Supplement to the County of San Bernardino General Plan Program SEIR for the Proposed Countywide
Lead Agency Greenhouse Gas (GHG) Emissions General Plan Amendment and Reduc
San Bernardino County

Type NOP Notice of Preparation

Description The County of San Bernardino is preparing a General Plan Amendment addressing GHG emissions, a Countywide Greenhouse Gas (GHG) Emissions Reduction Plan ("GHG Plan"), and as lead agency under the California Environmental Quality Act (CEQA), a Draft Supplement to the County General Plan Program Environmental Impact Report (SCH No. 2005101038). The General Plan Amendment adds to the General Plan the policy and programs addressing the reduction of GHG emissions within the County boundaries. The GHG Plan addresses the reduction of GHG emissions in the unincorporated areas of the County that are under the County's land use authority, as well as all County operations and facilities, whether within an incorporated city, town or within an unincorporated area. The draft SEIR will address the environmental effects of implementing the GHG Plan in light of the previous environmental review in the General Plan Program EIR as provided for under CEQA Guidelines 15163.

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Project Location

County San Bernardino
City San Bernardino, Riverside
Region
Cross Streets Various
Lat / Long
Parcel No. Various
Township **Range** **Section** **Base** SBB&M

Proximity to:

Highways Hwy 111 & 86
Airports
Railways UPR
Waterways Imperial Irrigation District Canals & Drains
Schools
Land Use Various

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Drainage/Absorption; Noise; Public Services; Vegetation; Water Supply; Wildlife; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Conservation; California Energy Commission; Cal Fire; Department of Parks and Recreation; Department of Fish and Game, Region 6; Office of Emergency Management Agency, California; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Caltrans, District 8; Caltrans, District 9; Air Resources Board, Transportation Projects; Regional Water Quality Control Bd., Region 6 (Victorville); Regional Water Quality Control Board, Region 7; Department of Fish and Game, Region 6 (Inyo & Mono Region)

Date Received 09/20/2010 **Start of Review** 09/20/2010 **End of Review** 10/19/2010

Note: Blanks in data fields result from insufficient information provided by lead agency.

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The following comments are arranged by topic area. Multiple comments of the same nature and topic from two or more commenters are combined herein. Subtext following each comment represents the source(s) of the comments, according to the sources listed in Table A-1. The specific comments arranged by topic area are shown in Table A-2.

TABLE A-1 – LIST OF COMMENT SOURCES (CHRONOLOGICAL)

Reference Number	Commenter	Date of Comment
1	Matthew Vespa, Center for Biological Diversity	9/28/2010
2	Sue Walker, Sierra Club Mountains Group	9/29/2010
3	Tom Hall, San Bernardino National Forest	9/29/2010
4	Michael Massimini, City of Barstow	9/29/2010
5	Robin Maloney-Rames, California Department of Fish and Game	10/14/2010
6	Ian MacMillan, South Coast Air Quality Management District	10/19/2010
7	Steven Farrel, Sierra Club Mountains Group	10/20/2010

TABLE A-2 –COMMENTS BY TOPIC (ANNOTATED)

Topic Area	Comments	Where Environmental Issues Area Addressed in Draft SEIR
Air Quality	<ul style="list-style-type: none"> • The lead agency should identify any potential air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. • Air quality impacts from both construction and operations should be calculated. • Quantify PM2.5 emissions and compare results to significance thresholds. • Calculate localized air quality impacts and comparing results to localized significance thresholds. • In the event the project generates or attracts vehicular trips, a health risk assessment should be performed. 	<p>Refer to SEIR Section 3.3, Air Quality which discusses potential impacts to air quality from construction emissions. The SEIR is a program EIR and will not evaluate project specific impacts for individual projects. Rather the General Plan EIR adopted policies and the SEIR provides mitigation measures that ensure impacts to air quality are reduced to the extent that they are feasible</p>
Forest Land	<ul style="list-style-type: none"> • Actions that might supersede USDA Forest Service Management on National Forest System lands 	<p>The SEIR Section 3.2 has identified that implementation of the project would not result in forest impacts.</p>
Biological Impacts	<ul style="list-style-type: none"> • The Draft SEIR should suggest general mitigation measures for future projects developed under the GHG Plan. • Biological Assessments should be conducted within a year of distribution of the CEQA document. • The existing condition of the project site designated in the CEQA document as degraded or “agricultural use” does not preclude the presence of native species. • Concern about the continuing loss of jurisdictional waters of the State and encroachment into areas with native habitat values. The DEIR should contain sufficient, specific and current biological information on the existing habitat and species of the project site 	<p>Refer to SEIR Section 3.4 which discusses potential impacts to biological resources and provides mitigation measures for potential impacts to these resources. The SEIR is a program EIR and will not evaluate site specific impacts for individual projects. Rather the General Plan EIR adopted policies and the SEIR provides mitigation measures that ensure impacts to biological resources are reduced to the extent that they are feasible.</p>
Water and Hydrology	<ul style="list-style-type: none"> • Public concerns regarding availability and water quality impacts associated with uses of water for alternative energy project, such as solar projects. 	<p>Refer to SEIR, Section 3.7, Hydrology and Water Quality, which includes a discussion of groundwater and water quality and SEIR, Section 3.9, which includes a discussion regarding water supply.</p>
Land Use	<ul style="list-style-type: none"> • Public concerns about the Draft SEIR evaluating the impacts of potential Land Use and zoning changes. • Development and residential policies that favor less VMT (higher densities, less sprawl, more integrated business and residential) will inevitably have potentially significant impacts on growth in ways that were not addressed in the 2007 GP EIR 	<p>The GHG Plan does not result in any new development potential or construction of facilities. It would function as an implementation tool of the General Plan and does not modify designated land uses or patterns or policy provisions. There are no proposed changes to land use</p>

NOP/SCOPING COMMENTS

Topic Area	Comments	Where Environmental Issues Area Addressed in Draft SEIR
		<p>designations in the General Plan as part of this project. Implementation of the project does not create development or residential policies which favor less VMT. The plan promotes reduced VMT through policies reduction strategies, such as implementation of vehicle miles traveled reduction strategies (R2T2), the construction of vehicle lanes for high-occupancy vehicles (R2T8), and roadway improvements including signal synchronization and traffic flow management provisions (R2T4). Further, reduction measures such as R3T4 and R3T4-INT, Regional Land Use and Transportation Coordination, are intended to reduce greenhouse gas emissions by reducing passenger vehicle travel. R3T4 and R3T4-INT could require consideration of alternative land use and transportation patterns through pre-existing state and federal planning processes, which are not under County jurisdiction.</p> <p>These impacts will not be addressed in the Draft SEIR.</p>
Alternatives	<ul style="list-style-type: none"> • The project has the potential to have significant environmental impacts on sensitive flora and fauna resource, the DEIR should include an alternatives analysis which focuses on ways to avoid or minimize impacts to these resources • There should be an extensive matrix of "alternative" approaches to achieve the GHG Emissions Reductions. 	<p>Refer to SEIR, Section 4.0, Alternatives Analysis which provides an Alternative that seeks to reduce potential impacts to sensitive biological resources.</p> <p>Refer to SEIR, Section 4.0, Alternatives Analysis which provides a matrix of the Alternatives for the proposed Project.</p>
Mitigation Measures	<ul style="list-style-type: none"> • Ensuring that mitigation measures and emissions reduction measures are enforceable and that the benefits of such measures are quantified where feasible. 	<p>The GHG Plan and associated SEIR includes reduction measures and mitigation measures that are specific and enforceable. In addition, the reduction measures' benefits are quantified where feasible.</p> <p>Mitigation measures are summarized in Table ES-1 and Reduction measures are listed in Section 2-5 through 2-14 and are summarized in Table 2-15 of the</p>

NOP/SCOPING COMMENTS

Topic Area	Comments	Where Environmental Issues Area Addressed in Draft SEIR
		<p>SEIR.</p> <p>The GHG Plan includes a review of the Attorney General’s Office list of mitigation measures and CAPCOA’s potential measures in its guidance documents, Model Policies for GHGs in General Plans and Quantifying GHG Mitigation Measures for potential mitigation measures.</p>
	<ul style="list-style-type: none"> Mitigation Measures to Address All Aspects of the County’s Carbon Footprint. Review the Attorney General’s Office list of mitigation measures and CAPCOA’s potential measures in its guidance documents, Model Policies for GHGs in General Plans and Quantifying GHG Mitigation Measures for potential mitigation measures. As transportation related emissions are a significant source of emissions in the County, the County should adopt robust additional measures that reduce VMT by promoting infill and mixed use and discourage suburban sprawl. 	<p>Refer to SEIR Section 23.10 Transportation and Circulation, transportation Reduction Measures are provided in GHG Reduction Plan, for example R3T4 and R3T4-INT, Regional Land Use and Transportation Coordination, are intended to reduce greenhouse gas emissions by reducing passenger vehicle travel. R3T4 and R3T4-INT could require consideration of alternative land use and transportation patterns through pre-existing state and federal planning processes.</p>
General Miscellaneous	<ul style="list-style-type: none"> Per Capita Reduction Target to determine whether the GHG Reduction Plan functions to reduce emissions from activities covered under the plan to below a level of significance, the County should assess the Plan’s effect in reducing per capita emissions. Because the General Plan extends beyond 2020, the per capita target should be reduced consistent with California’s 2050 emission reduction objectives 	<p>The County’s GHG Plan and its determination of significance are based on direction from the AB 32 Scoping Plan to ensure California GHG emissions are less than 1990 GHG emissions by the year 2020. The California Air Resources Board (CARB) states, “ARB recommends a greenhouse gas reduction goal for local governments of 15 percent below today’s levels by 2020 to ensure that their municipal and community-wide emissions match the State’s reduction target” (ARB, AB 32 Scoping Plan. December 2008. Page 3). The reduction targets are not intended to be per capita targets. Per capita reduction targets will be developed for transportation-related emission under the regional Senate Bill (SB) 375 process; however, it is not anticipated that the GHG Plan would conflict with the per capita target once set.</p> <p>The State has not formally adopted GHG reduction targets for any year past 2020. Governor</p>

NOP/SCOPING COMMENTS

Topic Area	Comments	Where Environmental Issues Area Addressed in Draft SEIR
	<ul style="list-style-type: none"> Need more specificity in the Plan. For example, transportation should be broken down by on-road vehicles, off-road vehicles; air transportation and rail transportation 	<p>Schwarzenegger approved Executive Order S-3-05 in 2005, which created a goal to reduce statewide emissions by 50% below 1990 levels by 2050. This 2050 goal was not part of AB 32 and has not since been legislatively mandated.</p> <p>Reduction targets for the proposed Project are addressed in Section 3.11 (Climate Change and Greenhouse Gases).</p> <p>The County has provided reduction measures in a variety of sectors, reduction measures are listed in Section 2-5 through 2-14 and are summarized in Table 2-15 of the SEIR.</p>

**APPENDIX B - COUNTY OF SAN BERNARDINO
DRAFT GREENHOUSE GAS EMISSIONS
REDUCTION PLAN**

COUNTY OF SAN BERNARDINO

DRAFT GREENHOUSE GAS EMISSIONS REDUCTION PLAN



September 2011

Acknowledgements

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San Bernardino County General Plan

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1. INTRODUCTION

GHG 1.1 PURPOSE OF THE GHG PLAN	1-2
GHG 1.2 GOALS OF THE GHG REDUCTION PLAN	1-4
GHG 1.3 RELATIONSHIP TO THE COUNTY GENERAL PLAN.....	1-4
GHG 1.4 DESCRIPTION OF GHG GASES	1-4
GHG 1.5 SUMMARY OF CALIFORNIA EMISSIONS.....	1-5
GHG 1.6 REGULATORY BACKGROUND.....	1-5
GHG 1.7 SETTLEMENT AGREEMENT WITH THE ATTORNEY GENERAL'S OFFICE.....	1-11
GHG 1.8 THE CALIFORNIA ENVIRONMENTAL QUALITY ACT.....	1-11
GHG 1.9 THE COUNTY'S ROLE IN GHG EMISSIONS REDUCTION.....	1-12
GHG 1.10 ORGANIZATION OF GHG REDUCTION PLAN.....	1-13

2. INVENTORY

GHG 2.1 INVENTORY METHODOLOGY	2-1
GHG 2.2 EXTERNAL INVENTORY	2-4
GHG 2.3. INTERNAL INVENTORY.....	2-6

3. 2020 GHG REDUCTION TARGET

GHG 3.1 THE 2020 GHG REDUCTION TARGET	3-1
GHG 3.2 EXTERNAL INVENTORY OF GHG EMISSIONS.....	3-5
GHG 3.3 INTERNAL INVENTORY OF GHG EMISSIONS.....	3-6

4 GHG REDUCTION GOALS, OBJECTIVES & STRATEGIES

GHG 4.1. ATTAINING THE REDUCTION TARGET`	4-1
GHG 4.2. EXTERNAL GHG EMISSIONS: REDUCTION GOALS, OBJECTIVES AND STRATEGIES	4-7
GHG 4.2.1 BUILDING ENERGY SECTOR	4-7
GHG 4.2.2 TRANSPORTATION AND LAND USE SECTOR	4-19
GHG 4.2.3 SOLID WASTE SECTOR.....	4-35
GHG 4.2.4 STATIONARY SOURCE SECTOR	4-41
GHG 4.2.5 AGRICULTURE & RESOURCE CONSERVATION SECTOR.....	4-45
GHG 4.2.6 WATER CONSERVATION SECTOR.....	4-49
GHG 4.3 INTERNAL GHG EMISSIONS REDUCTION GOALS, OBJECTIVES AND STRATEGIES	4-54
GHG 4.3.1 BUILDING ENERGY SECTOR	4-55
GHG 4.3.2 FLEET / FUEL EMISSIONS SECTOR	4-57
GHG 4.3.3 SOLID WASTE/ LANDFILL EMISSIONS SECTOR.....	4-58
GHG 4.3.4 EMPLOYEE COMMUTE SECTOR	4-60
GHG 4.3.5 CARBON SEQUESTRATION STRATEGIES.....	4-62
GHG 4.3.6 COUNTY PURCHASING	4-62
GHG 4.3.7 SUMMARY.....	4-63

5. PUTTING THE PLAN INTO ACTION

GHG 5.1. ADMINISTRATION AND STAFFING.....	5-1
GHG 5.2. FUNDING AND BUDGETING	5-3
GHG 5.2.1 ENERGY EFFICIENCY FUNDING.....	5-5



GHG 5.2.2 TRANSPORTATION FUNDING 5-7

GHG 5.2.3 WASTE REDUCTION FUNDING 5-8

GHG 5.2.4 WATER CONVEYANCE AND TREATMENT FUNDING 5-9

GHG 5.3 TIMELINE AND PRIORITIZATION..... 5-10

GHG 5.4 PUBLIC INVOLVEMENT 5-14

GHG 5.5 REGIONAL COOPERATION 5-15

GHG 5.5.1 GREEN VALLEY INITIATIVE 5-15

GHG 5.5.2 OTHER REGIONAL COOPERATION OPPORTUNITIES 5-16

GHG 5.6 DEVELOPMENT PROJECT REVIEW..... 5-16

GHG 5.7 MONITORING, INVENTORYING AND REPORTING 5-20

GHG 5.8 ADDITIONAL PLANNING ACTIVITIES 5-21

GHG 5.8.1 ADDRESSING SB 375..... 5-21

GHG 5.8.2 BEYOND 2020 5-23

GHG 5.9 AMENDING THE GHG PLAN 5-24

GLOSSARY / ACRONYMS AND ABBREVIATIONS

- A. EXTERNAL INVENTORY/REDUCTION MEASURES METHODOLOGY
- B. INTERNAL INVENTORY/REDUCTION PLAN METHODOLOGY
- C. RELEVANT (EXISTING) SAN BERNARDINO COUNTY GENERAL PLAN POLICIES
- D. SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT INVENTORY
- E. A LOOK FORWARD TO 2030
- F. GREENHOUSE GAS EMISSIONS - DEVELOPMENT REVIEW PROCESSES

LIST OF FIGURES

FIGURE 1-1 JURISDICTIONAL LAND USE AUTHORITY IN SAN BERNARDINO COUNTY 1-3

FIGURE 2-1 EXTERNAL INVENTORY OF GHG EMISSIONS 2-4

FIGURE 2-2 INTERNAL INVENTORY OF GHG EMISSIONS 2-7

FIGURE 3-1 EXTERNAL EMISSIONS BY SECTOR 3-2

FIGURE 3-2 INTERNAL EMISSIONS BY SECTOR..... 3-2

FIGURE 3-3 EXTERNAL EMISSIONS INVENTORY AND REDUCTION TARGETS... 3-3

FIGURE 3-4 INTERNAL EMISSIONS INVENTORY AND REDUCTION TARGETS..... 3-4

FIGURE 3-5 EXTERNAL INVENTORY, CURRENT, 2020 UNMITIGATED, AND 2020 MITIGATED EMISSIONS LEVELS WITH REDUCTION GOALS 3-5

FIGURE 3-6 INTERNAL INVENTORY, CURRENT, 2020 UNMITIGATED, AND 2020 MITIGATED EMISSIONS LEVELS WITH REDUCTION GOALS 3-6

FIGURE 4-3 EXTERNAL GHG EMISSION REDUCTIONS FROM BUILDING ENERGY MEASURES 4-18

FIGURE 4-4 EXTERNAL GHG EMISSION REDUCTIONS FROM TRANSPORTATION AND LAND USE MEASURES 4-34

FIGURE 4-5 EXTERNAL GHG EMISSION REDUCTIONS FROM SOLID WASTE/LANDFILL MEASURES..... 4-41

FIGURE 4-6 EXTERNAL GHG EMISSION REDUCTIONS FROM STATIONARY SOURCES 4-44

FIGURE 4-7 EXTERNAL GHG EMISSION REDUCTIONS FROM WATER CONSERVATION MEASURES..... 4-54



FIGURE 4-8 SUMMARY OF INTERNAL GHG EMISSION REDUCTIONS..... 4-64

LIST OF TABLES

TABLE 2-1 SAN BERNARDINO COUNTY EXTERNAL EMISSIONS SUMMARY . 2-6
TABLE 2-2 SAN BERNARDINO COUNTY INTERNAL EMISSIONS SUMMARY .. 2-8
TABLE 4-1 SUMMARY OF EXTERNAL EMISSIONS REDUCTION BY SECTOR 4-2
TABLE 4-2 SUMMARY OF INTERNAL REDUCTIONS BY SECTOR..... 4-3
TABLE 4-3 EXTERNAL GHG EMISSION REDUCTIONS FROM IMPLEMENTATION OF BUILDING ENERGY (ENERGY EFFICIENCY & RENEWABLE ENERGY) STRATEGIES 4-17
TABLE 4-4 EXTERNAL GHG EMISSION REDUCTIONS FROM IMPLEMENTATION OF LAND USE AND TRANSPORTATION STRATEGIES..... 4-32
TABLE 4-5 EXTERNAL GHG EMISSION REDUCTIONS FROM IMPLEMENTATION OF SOLID WASTE STRATEGIES 4-40
TABLE 4-6 EXTERNAL GHG EMISSION REDUCTIONS FROM IMPLEMENTATION OF STATIONARY SOURCE STRATEGIES..... 4-43
TABLE 4-7 EXTERNAL EMISSION REDUCTIONS FROM IMPLEMENTATION OF AGRICULTURE AND RESOURCE CONSERVATION STRATEGIES..... 4-48
TABLE 4-8 EXTERNAL GHG EMISSION REDUCTIONS FROM IMPLEMENTATION OF WATER SUPPLY STRATEGIES..... 4-53
TABLE 4-9 INTERNAL GHG EMISSION REDUCTIONS FROM IMPLEMENTATION OF INTERNAL STRATEGIES..... 4-63
TABLE 5-1 ANTICIPATED PHASING OF EXTERNAL GHG REDUCTION MEASURES 5-11

APPENDICES

APPENDIX A EXTERNAL INVENTORY/REDUCTION MEASURES
METHODOLOGY
APPENDIX B INTERNAL INVENTORY/REDUCTION PLAN METHODOLOGY
APPENDIX C RELEVANT (EXISTING) SAN BERNARDINO COUNTY GENERAL PLAN POLICIES
APPENDIX D SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT INVENTORY
APPENDIX E A LOOK FORWARD TO 2030
APPENDIX F DRAFT GHG EMISSIONS SCREENING TABLES



ACRONYMS AND ABBREVIATIONS

AB 32	California Assembly Bill 32 (the Global Warming Solutions Act of 2006)
ACS	American Community Survey
AQMP	Air Quality Management Plan
ARMC	Arrowhead Regional Medical Center
ARRA	American Recovery and Reinvestment Act
BAU	Business-As-Usual
BTU	British Thermal Unit
BVE	Bear Valley Electric
C&D	Construction and demolition
CANHP	California New Homes Program
CAO	County Administrative Officer
CARB	California Air Resources Board
CBECS	Commercial Building Energy Consumption Survey
CCAR	California Climate Action Registry
CCAs	Community Choice Aggregators
CSDSP	Comprehensive Disposal Site Diversion Program
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH ₄	Methane
CIWMB	California Integrated Waste Management Board
CNG	Compressed natural gas
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
COP	Conference of the Parties
County	San Bernardino County
CPUC	California Public Utilities Commission
CREB	Clean Renewable Energy Bonds
CSI	California Solar Initiative
CTC	California Transportation Commission
CWSRF	Clean Water State Revolving Funds.
DEER	Database for Energy Efficiency
EECBG	Energy Efficiency Community Block Grants
EIR	Environmental Impact Report
ESCO	Energy Service Companies
ESPs	Energy Service Providers
EUL	Effective Useful Life
FTA	Federal Transit Authority
FY	Fiscal Year
GHG	Greenhouse Gases
GIS	Geographic Information Systems
GIVE	Green Institute for Village Empowerment
GPS	Global positioning system
GRT	GHG Reduction Team
GWP	Global Warming Potential
HCFCs	Halogenated Chlorinated Fluorocarbons
HFCs	Hydrofluorocarbons



ACRONYMS AND ABBREVIATIONS (CONT'D)

HHV	High heating values
HOV	High Occupancy Vehicle Lanes
HVAC	Heating, Ventilation, and Air Conditioning
IEUA	Inland Empire Utility Agency
IIP	Interregional Improvement Program
IOUs	Investor-Owned Utilities
IPCC	Intergovernmental Panel on Climate Change
kBTU	Thousand BTU
kWh	Kilowatt Hour
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
LGOP	Local Government Operations Protocol
LNG	Liquefied Natural Gas
LMOP	Landfill Methane Outreach Program
LPG	Liquefied Petroleum Gas
LTF	Local Transportation Funds
LUA	Land use authority
LUSD	Land Use Services Department
MDAQMD	Mojave Desert Air Quality Management District
MGI	McKinsey Global Institute
MMTCO ₂ e	Million Metric Tons of CO ₂ Equivalent
MPOs	Metropolitan Planning Organizations
MTCO ₂ e	Metric Tons of Carbon Dioxide Equivalent
MWH	Megawatt Hour
N ₂ O	Nitrous Oxide
NSHP	New Solar Homes Partnership
O ₃	Ozone
ODS	Ozone depleting substances
OPR	Office of Planning and Research
PFCs	Perfluorinated carbons
PG&E	Pacific Gas & Electric
ppm	Parts per million
PV	Photovoltaic
R1	Reduction Classification 1
R2	Reduction Classification 2
R3	Reduction Classification 3
RCRA	Resource Conservation and Recovery Act
RECS	Residential Energy Consumption Survey
RIP	Regional Improvement Program
RPS	Renewable Portfolio Standard
RTGGT	Regional Transportation Greenhouse Gas Targets
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SANBAG	San Bernardino Association of Governments



ACRONYMS AND ABBREVIATIONS (CONT'D)

SBCGB	San Bernardino County Green Builder
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCAQMP	South Coast Air Quality Management Plan
SCE	Southern California Edison
SCG	Southern California Gas Company
SF ₆	Sulfur hexafluoride
SRI	Solar Reflectance Index
STIP	State Transportation Improvement Program
SUV	Sports utility vehicle
SWG	Southwest Gas
SWP	State Water Project
TACs	Toxic air contaminants
TBD	To Be Determined
TDA	Transportation Development Act
ULEV	Ultra low emission vehicle
UNEP	United Nations Environmental Programme
UNFCC	United Nations Framework Convention on Climate Change (UNFCC)
USEIA	United States Energy Information Administration
USEPA	United States Environmental Protection Agency
VMT	Vehicle miles travelled
WARM	Waste Reduction Model
WIP	Waste-in-place



CHAPTER 1.0

INTRODUCTION

The San Bernardino County Board of Supervisors recognizes that prosperity and economic development cannot be achieved at the expense of our environment. The County must strike a balance between development and environmental stewardship to keep the economy strong and, at the same time, protect the environment.

In August 2007, the Board of Supervisors launched Green County San Bernardino to spur the use of “green” technologies and building practices among residents, business owners, and developers in the County. By supporting “green” building practices, renewable energy, resource conservation, and other efforts to safeguard our environment, the Board of Supervisors set the course for sustainability and paved the way for responsible growth in the County of San Bernardino.

Recognizing that reducing greenhouse gas (“GHG”) emissions is an important part of ensuring a sustainable future, the County Board of Supervisors also directed the Land Use Services Department to prepare a GHG Reduction Plan, to provide a framework and strategy for the County’s efforts. By using energy more efficiently, harnessing renewable energy to power buildings, enhancing access to sustainable transportation modes, and recycling waste, the County can keep dollars in the local economy, create new green jobs, and improve the community quality of life.

The Conservation Element of the County’s General Plan addresses a number of different natural resources within the County that must be managed properly. Among these resources are air quality and the control of GHG emissions. Goal CO 4 specifically speaks to air quality and states:

“The County will ensure good air quality for its residents, businesses, and visitors to reduce impacts on human health and the economy.”

In order to implement this goal and to provide a more livable and economically vibrant community, the County will implement this GHG Reduction Plan to ensure that impacts on air quality are minimized, and that land use and internal operations within the County are consistent with adopted state legislation.

County Jurisdiction

Although San Bernardino County is the largest county (approximately 13 million acres) in the contiguous United States, the Board of Supervisors’ land use authority over the entire County is limited to 15 percent (about 1.9 million acres) of the total area. This GHG Reduction Plan has been undertaken with full recognition of these limitations of land use jurisdiction and other governmental structure issues.



Federal and state agencies own and control 81 percent (10.5 million acres) of the total County lands (approximately 13 million acres). This land is referenced as “non-jurisdiction” land or “non-jurisdiction” territory as it lies outside the governing control of the County Board of Supervisors. Of this non-jurisdiction land, approximately six (6) million acres are owned and controlled by the U. S. Bureau of Land Management; and 1.9 million acres are owned and controlled by the United States Department of Defense. In addition, approximately four (4) percent lies within 24 incorporated towns and cities. Incorporated areas are regulated by the respective town and city councils. The County’s influence over development activity within the incorporated boundaries of these towns and cities is limited primarily to County owned administrative buildings, criminal justice facilities, and certain infrastructure, including County-maintained roads.

The County’s land use authority has other limitations. Public utilities and railroads are generally not subject to the County’s land use authority. Public water districts/agencies are also not subject to the County’s land use authority; however, private water companies generally are.

Figure 1-1 depicts the incorporated and unincorporated portions of the County, as well as federal and state lands. The entire 13 million-acre area is the County’s geopolitical territory (“Countywide” area). The area over which the County has discretionary land use authority as well as its ministerial building permit authority is depicted in white on **Figure 1-1**.

The County’s discretionary land use authority, as well as its ministerial building permit authority, is collectively referred to herein as “Land Use Authority” or “LUA.” In this Plan, the terms “Unincorporated County” and “County LUA” are used interchangeably.

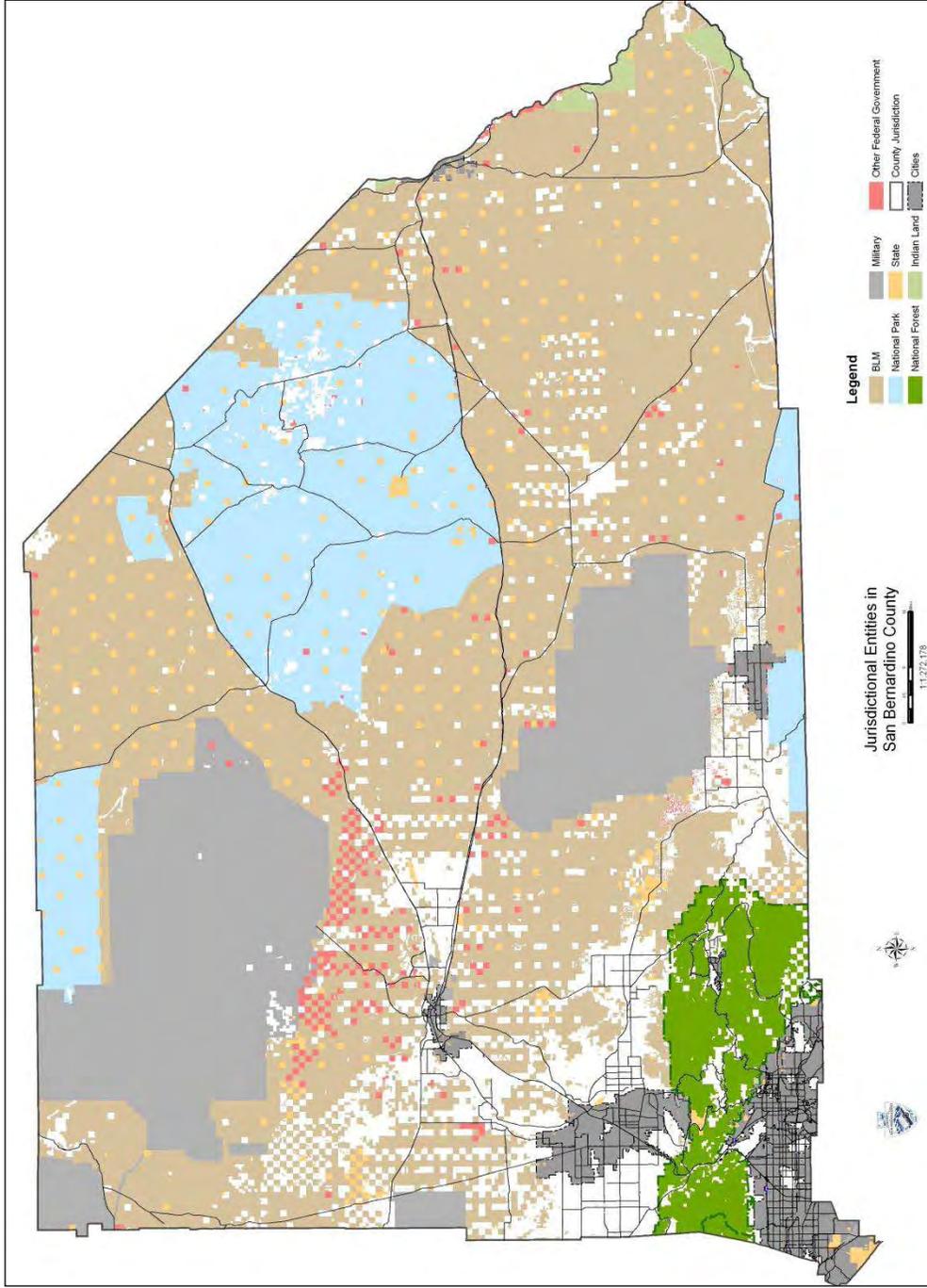
GHG 1.1 Purpose of the GHG Reduction Plan

The San Bernardino County GHG Reduction Plan (“GHG Plan” or “GHG Reduction Plan”) is based on the premise that the County and the community it represents are uniquely capable of addressing emissions associated with sources under the County’s jurisdiction and that the County’s emission reduction efforts should coordinate with the state strategies of reducing emissions in order to reduce emissions in an efficient and cost-effective manner.

This GHG Plan presents a comprehensive set of actions to reduce the County’s internal and external GHG emissions to 15% below current levels by 2020, consistent with the AB 32 Scoping Plan. (AB 32 Scoping Plan page ES 5, CARB, December 2008,)



Figure 1-1: Jurisdictional Land Use Authority in San Bernardino County



Cities in San Bernardino County	
1.	Adelanto
2.	Apple Valley
3.	Barstow
4.	Big Bear City
5.	Chino
6.	Chino Hills
7.	Colton
8.	Fontana
9.	Grand Terrace
10.	Hesperia
11.	Highland
12.	Loma Linda
13.	Montclair
14.	Needles
15.	Ontario
16.	Rancho Cucamonga
17.	Redlands
18.	Rialto
19.	San Bernardino
20.	Twentynine Palms
21.	Upland
22.	Victorville
23.	Yucaipa
24.	Yucca Valley

Source: San Bernardino County Land Use Services Department, 2011



GHG 1.2 GHG Reduction Plan Objectives

The County's GHG Reduction Plan has been prepared to accomplish the following specific objectives to:

- Reduce emissions from activities over which the County has jurisdictional and operational control consistent with the target reductions of Assembly Bill (AB) 32 Scoping Plan;
- Provide estimated GHG reductions associated with the County's existing sustainability efforts and integrate the County's sustainability efforts into the discrete actions of this Plan;
- Provide a list of discrete actions that will reduce GHG emissions; and
- Approve a GHG Plan that satisfies the requirements of Section 15183.5 of the California Environmental Quality Act (CEQA) Guidelines, so that compliance with the GHG Plan can be used in appropriate situations to determine the significance of a project's effects relating to GHG emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG Plan.

GHG 1.3 Relationship to the County General Plan

The County General Plan¹ includes a series of linked documents, including: the General Plan text and a series of land use, hazard, circulation, and resource overlay maps, a separately bound Housing Element, the community plans, and the background reports. Additionally, the General Plan lists various implementation tools that are incorporated as separate policies and documents. The General Plan will be amended to include a policy and programs addressing the County's intent to reduce GHG emissions that are reasonably attributable to : (1) the county's internal activities, services and facilities; and (2) private industry and development tht is located within the area subject to the County's land use and building permit authority. The GHG Plan will act as an implementation tool similar to those described in the General Plan to guide development in the County by focusing on attaining the various goals and policies of the General Plan and all community plans relative to GHG emissions and to achieve the goals, objectives and strategies set forth in GHG Plan. The goals, objectives and reduction strategies described in the GHG Plan are consistent with the goals, policies, and programs contained in the General Plan.

GHG 1.4 Description of Greenhouse Gases

The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." GHGs absorb heat radiated from the Earth's surface. As the atmosphere warms, it in turn radiates heat back to the surface to create the greenhouse effect. According to the United States Environmental Protection Agency (USEPA), a GHG is any gas that absorbs infrared radiation in

¹ References to the "General Plan" include the General Plan as adopted in March 2007 and amendments made subsequent thereto.



the atmosphere. AB 32 and the CEQA Guidelines define the following six (6) GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO₂), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). In 2009, nitrogen trifluoride (NF₃) was listed by California as a high global warming potential GHG to be listed and regulated under AB32 (CARB 2010).

GHGs are both naturally occurring and anthropogenic (e.g. man-made). Once emitted, GHGs remain in the atmosphere for decades or centuries and can mix on a global scale. Innumerable direct and indirect sources, both natural and anthropogenic, cause increased atmospheric concentrations of GHGs. Natural sources of GHGs include decomposition of organic matter, volcanic activities, and wildfires. Many human activities add to the levels of naturally occurring gases. Carbon dioxide is released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned. Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. Carbon dioxide and nitrous oxide are the two (2) GHGs released in the greatest quantities from mobile sources burning gasoline and diesel fuel. Methane, a highly potent GHG, results from releases associated with agricultural practices and landfills, among other sources.

As the global, national, and statewide population and economy continue to grow, anthropogenic emissions of GHGs continue to increase. The associated increase in atmospheric concentrations has the potential to cause adverse environmental impacts (see discussion in legislative findings associated with AB 32 below).

GHG 1.5 Summary of California Emissions

Worldwide, California is responsible for approximately two percent of the world's CO₂ emissions (CEC 2006a). The California Energy Commission (CEC) estimates that California is the second largest emitter of GHG emissions in the United States. CARB estimates that 1990 emissions amounted to 433 MMTCO₂e and that 2004 emissions levels were 484 MMTCO₂e (CARB 2007). The transportation sector produced 40.7 percent of California's GHG emissions in 2004. The next largest sources of GHG emissions in 2004 include: electric power production (22.2 percent), industrial sector (20.5 percent), agriculture and forestry (8.3 percent), and other miscellaneous sectors (8.3 percent) (CEC 2006b).

GHG 1.6 Regulatory Background

AB 32—The Global Warming Solutions Act of 2006

California Assembly Bill 32 (AB 32), the “Global Warming Solutions Act of 2006,” codified the state's GHG emissions target by directing California Air Resources Board (CARB) to reduce the state's global warming emissions to 1990 levels by 2020.



As established by AB 32, California Health and Safety Code Section 38501 states the following:

The Legislature finds and declares all of the following:

Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

California has long been a national and international leader on energy conservation and environmental stewardship efforts, including the areas of air quality protections, energy efficiency requirements, renewable energy standards, natural resource conservation, and greenhouse gas emission standards for passenger vehicles. The program established by this division will continue this tradition of environmental leadership by placing California at the forefront of national and international efforts to reduce emissions of greenhouse gases.

National and international actions are necessary to fully address the issue of global warming. However, action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.

By exercising a global leadership role, California will also position its economy, technology centers, financial institutions, and businesses to benefit from national and international efforts to reduce emissions of greenhouse gases. More importantly, investing in the development of innovative and pioneering technologies will assist California in achieving the 2020 statewide limit on emissions of greenhouse gases established by this division and will provide an opportunity for the state to take a global economic and technological leadership role in reducing emissions of greenhouse gases.

AB 32 was established as law by Governor Arnold Schwarzenegger on September 27, 2006. Since that time, CARB, California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the Building Standards Commission have all been at work on regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

Key AB 32 milestones are as follows:

- June 30, 2007—Identification of “discrete early action GHG emissions reduction measures.” This has been completed and is discussed below.
- January 1, 2008—Identification of the 1990 baseline GHG emissions level and approval of a statewide limit equivalent to that level. Adoption of reporting and verification requirements concerning GHG emissions. This has been completed. In December 2007, CARB approved the 2020 emission limit of 427 MMTCO₂e of



GHGs for the State of California.

- January 1, 2009—Adoption of a Scoping Plan for achieving GHG emission reductions. A scoping plan was adopted in December 2008 and is summarized below.
- January 1, 2010—Adoption and enforcement of regulations to implement the “discrete” early actions.
- January 1, 2011—Adoption of GHG emission limits and reduction measures by regulation.
- January 1, 2012—GHG emission limits and reduction measures adopted in 2011 become enforceable.

AB 32 Early Actions

CARB adopted the following early actions on June 21, 2007:

Group 1—Three (3) new GHG-specific regulations are proposed to meet the narrow legal definition of “discrete early action greenhouse gas reduction measures” in Section 38560.5 of the Health and Safety Code. These include the Governor’s Low Carbon Fuel Standard, reduction of refrigerant losses from motor vehicle air conditioning maintenance, and increased methane capture from landfills. These actions are estimated to reduce GHG emissions between 13 and 26 MMTCO₂e annually by 2020 relative to projected levels. If approved for listing by the Governing Board, these measures will be brought to hearing in the next 12 to 18 months and take legal effect by January 1, 2010.

Group 2—CARB is initiating work on another 23 GHG emission reduction measures in the 2007–2009 time period, with rulemaking to occur as soon as possible where applicable. These GHG measures relate to the following sectors: agriculture, commercial, education, energy efficiency, fire suppression, forestry, oil and gas, and transportation.

Group 3—CARB staff has identified ten (10) conventional air pollution control measures that are scheduled for rulemaking in the 2007–2009 period. These control measures are aimed at criteria and toxic air pollutants, but will have concurrent climate co-benefits through reductions in CO₂ or non-Kyoto pollutants (i.e., diesel particulate matter, other light-absorbing compounds, and/or ozone precursors) that contribute to global warming.

In October 2007, CARB expanded the early actions to include the following measures:

Group 1 Discrete Early Actions—SF₆ reductions from the non-electricity sector; reduction of emissions from consumer products; Smartway Truck Efficiency (require existing trucks and trailers to be retrofitted with devices that reduce aerodynamic drag); tire inflation (require tune-up and oil change technicians to ensure proper tire inflation as part of overall service); reduction of PFCs from semiconductor industry; and Green ports (allow docked ships to shut off their auxiliary engines by plugging into shoreside electrical outlets or other technologies).



Group 2: Other Early Actions—refrigerant tracking, reporting, and recovery program; energy efficiency of California cement facilities; blended cements; anti-idling enforcement; and research regarding nitrogen land application efficiency.

Since October 2007, CARB has taken the following actions concerning Early Action Measures:

Low Carbon Fuel Standard – CARB approved for adoption regulations establishing a low-carbon fuel standard on April 23, 2009. The intent of the standard is to reduce the carbon intensity of transportation fuels by an average of ten percent by 2020. CARB intends to finalize rule-making for regulations to take effect by January 1, 2010.

Landfill Methane Capture – On June 25, 2009, CARB approved for adoption regulations for control of methane emissions from municipal solid waste (MSW) landfills. The regulations will require the installation and proper operation of gas collection and control systems at active, inactive, and closed MSW landfills having 450,000 tons or greater of waste-in-place and that received waste after January 1, 1977. The regulations contain performance standards for the gas collection and control system, and specify monitoring requirements to ensure that the system is being maintained and operated in a manner to minimize methane emissions. The regulations include a leak standard for gas collection and control system components, a monitoring requirement for wellheads, methane destruction efficiency requirements for most control devices, surface methane emission standards, and reporting requirements. CARB is presently considering several modifications and clarifications to the regulations. CARB intends to finalize rule-making for regulations to take effect by January 1, 2010.

Small Containers of Automotive Refrigerant – On January 22, 2009, CARB approved for adoption regulations associated with do-it-yourself (DIY) recharging of motor vehicle air conditioning (MVAC) systems. This regulation is intended to help reduce GHG emissions attributable to small containers of automotive refrigerant largely by establishing certification requirements that require containers to be equipped with self-sealing valves, and by establishing a small container deposit and return and refrigerant recovery program. Other components of the regulation include improved container labels and consumer educational materials to promote consumer education of proper MVAC charging practices and of the environmental consequences of releasing refrigerant to the environment. On September 1, 2009, the Office of Administrative Law (OAL) approved the majority of the regulations, but disapproved the portion of the regulatory filing for adjustment of the refrigerant container deposit. CARB intends to finalize rule-making for regulations to take effect by January 1, 2010.

Semiconductor Perfluorocarbon Emissions – On February 26, 2009, CARB approved for adoption regulations related to semiconductor operations. The regulation applies to an owner or operator of a semiconductor or related devices operation that uses fluorinated gases or fluorinated heat transfer fluids. The regulation includes emission standards, and reporting and recordkeeping requirements. Final rule-making has not yet been completed.



Sulfur Hexafluoride Reduction – On February 26, 2009, CARB approved for adoption regulations related to the reduction of SF₆ from non-semiconductor and non-utility applications. This regulation would achieve GHG emission reductions from SF₆ applications through a phase-out of use over the next several years in the non-semiconductor and non-utility sectors. Several modifications to the adopted regulation are currently under consideration.

High Global Warming Potential Gases in Certain Consumer Products – On September 24, 2009 CARB approved for adoption regulations concerning toxic compounds, aromatics and high GWP gases in certain consumer products. The amendments are designed to reduce volatile organic compound (VOC) emissions but would also prohibit compounds with high GWP in multi-purpose solvent, paint thinner, and double-phase aerosol air fresheners, which are the three categories of consumer products proposed for regulation. Final rule-making has not yet been completed.

Heavy-Duty Vehicle GHG Emission Reduction Regulation – On December 11, 2008, CARB approved for adoption regulations concerning long-haul Heavy Duty Vehicle (HDV) fuel efficiency. A more efficient HDV uses less fuel, and as a result, emits less GHG emissions. A HDV consists of a heavy-duty tractor (tractor) and a trailer. The regulation requires new and existing long-haul on-road tractors (of a certain size), which operate on California highways, to be equipped with SmartWay approved aerodynamic technologies and low-rolling resistance tires. The regulation contains a phased implementation and includes several exemptions (such as for emergency vehicles). Final adoption of the regulation is expected in November 2009.

Tire Pressure – On March 26, 2009, CARB approved for adoption regulations to reduce GHG emissions from vehicles operating with under inflated tires. The regulation requires all Automotive Service Providers perform a tire inflation service (check and inflate) on all passenger vehicles that are brought into a facility for service or repair. Final rule-making has not yet been completed.

Shore Power – On December 6, 2007, CARB approved for adoption regulations to reduce emissions from diesel auxiliary engines on ocean-going vessels while at berth in California. The regulation requires operators of vessels meeting specified criteria to turn off their auxiliary engines for most of their stay in port. CARB anticipates that such vessels would then receive their electrical power from the shore, or use an alternative, but equally effective, means of emission reductions. Although the measure is intended to reduce NO_x and particulate matter emissions, the measure will produce a co-benefit of also reducing CO₂ emissions. The regulation took effect on January 2, 2009.

AB 32 Scoping Plan

In December 2008, CARB adopted its Scoping Plan, which outlines an approach to meet the AB 32 goal. The plan identifies measures to reduce GHG emissions to 1990 levels, which is approximately 28 percent below business as usual (BAU) emission levels projected for 2020, or about 15 percent from current levels.



SB 1078/SB 107—Renewable Portfolio Standard (RPS)

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California's RPS obligates investor-owned utilities (IOUs), energy service providers (ESPs), and community choice aggregators (CCAs) to procure an additional one percent of retail sales per year from eligible renewable sources until 20 percent is reached, no later than 2010. The CPUC and CEC are jointly responsible for implementing the program.

AB 1493—Greenhouse Gas Emission Standards for Automobiles

In 2002, California AB 1493 required CARB to develop and adopt the nation's first GHG emission standards for automobiles. The State of California in 2004 submitted a request for a waiver from federal clean air regulations (as the state is authorized to do under the Clean Air Act) to allow the state to require reduced tailpipe emissions of CO₂. In late 2007, the USEPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the state brought suit against USEPA related to this denial. In January 2009, President Obama directed the USEPA to assess whether its denial of the waiver was appropriate under the Clean Air Act. In June 2009, the USEPA granted California the waiver. Also in 2009, the Obama administration proposed federal vehicle greenhouse gas emissions and mileage standards that are roughly equivalent to AB 1493. If they are implemented, they would preempt implementation of AB 1493.

Executive Order S-3-05—Greenhouse Gas Emission Reduction Targets

In 2005, Governor Schwarzenegger issued California Executive Order S-3-05 establishing the following aspirational GHG emission reduction targets for California:

- Reduce GHG emissions to 2000 levels by 2010;
- Reduce GHG emissions to 1990 levels by 2020; and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

Executive Orders are binding only on state agencies. Accordingly, S-3-05 will guide state agencies' efforts to control and regulate GHG emissions, but will have no direct binding effect on local efforts.

Executive Order S-01-07

Executive Order S-01-07 was enacted by Governor Schwarzenegger on January 18, 2007. The order mandates the following: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least ten (10) percent by 2020; and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California.



GHG 1.7 Settlement Agreement with Attorney General's Office

Following the County's adoption of its General Plan in March 2007, the California Attorney General (AG) filed a lawsuit alleging that the EIR prepared for the General Plan Update did not comply with the requirements of CEQA in its analysis of GHG emissions and climate change. The County and the Attorney General subsequently entered into a settlement agreement, which required the AG to dismiss its lawsuit to set aside the General Plan and required the County to do the following:

- Prepare an amendment to its General Plan adding a policy that describes the County's goal of reducing those GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations; and
- Prepare a GHG Emissions Reduction Plan, which includes inventories, a reduction target, and reduction measures to meet the reduction target, by regulating those sources of GHG emissions reasonably attributable to the County's discretionary land use decisions and the County's internal government operations.

GHG 1.8 The California Environmental Quality Act (CEQA)

In 2007, the California State legislature adopted Senate Bill 97 (SB 97) requiring that the Office of Planning and Research (OPR) prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of greenhouse gas emissions or the effects of GHG emissions as required by CEQA.

The new CEQA Guidelines require:

- Inclusion of GHG analyses in CEQA documents;
- Quantification of GHG emissions;
- Determination of significance of GHG emissions; and,
- If significant GHG emissions would occur, adoption of mitigation to address significant emissions.

The Guidelines provide for streamlining the environmental review of project-level analysis of GHG emissions from a programmatic document, such as a greenhouse gas reduction plan, and allow for a finding of less than significant where a project is determined to be consistent with a local reduction plan. The CEQA Guidelines provide that the environmental analysis of specific projects may be tiered from a programmatic GHG plan that substantially lessens the cumulative effect of GHG emissions. If a public agency adopts such a programmatic GHG Plan, the environmental review of subsequent projects may be streamlined. A specific project's incremental contribution of GHG emissions will not be considered cumulatively significant if the project complies with the adopted GHG plan.



The provisions of the GHG Plan and the Appendices that support the GHG Plan comply with these provisions by providing a quantified reduction inventory of GHG emissions, and by providing a level based on substantial evidence below which activities subject to the GHG Plan will not make a cumulatively considerable contribution to greenhouse gas impact. That level is based on the State’s AB 32 goals. The GHG Plan and associated documents also identify and analyze the emissions associated with specific actions, and set forth performance standards to achieve the specified emissions goals. The analysis in the GHG Plan and the supporting documents demonstrates that this level will be achieved by these measures. Finally, the GHG Plan includes monitoring, and the GHG Plan will be adopted in a public process following environmental review.

GHG 1.9 The County’s Role in GHG Emissions Reduction

Local governments have influence and, in some cases, exclusive authority over activities that contribute to direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, as well as their own internal operations. The County has two distinct roles that it can play in promoting reductions of GHG emissions:

Community (“External”) GHG Emissions

The County has primary authority to plan, zone, approve and permit how land is developed to accommodate population growth and the changing needs of its jurisdiction. These decisions have impacts on the GHG emissions resulting from such land uses as transportation, housing, community waste and recycling, industry, forestry, water, agriculture, electricity and natural gas sectors, among others. Due to its unique position, the County can provide local leadership in reducing GHG emissions, for example, through the promotion of policies that reduce vehicle use and by working collaboratively with developers, building owners and residents to achieve energy efficiency and energy savings. In addition, the County, as CEQA lead agency must ensure that impacts of GHG emissions are mitigated when discretionary projects go through CEQA review. Through these mechanisms, the County can reduce emissions that occur within its land use jurisdiction, which are referred to in this GHG Plan as “community” or “External” emissions.

Municipal (“Internal”) GHG Emissions

The County can demonstrate leadership through taking actions to reduce the GHG emissions associated with County government operations including those associated with County buildings, fleet operations, solid waste management, and other government functions (Internal Emissions). By doing so, the County can demonstrate the feasibility of taking action to the community as a whole. When implementing certain measures with net positive economic benefits (such as many energy efficiency improvements), the County can also reduce the long-term cost of County government as well.



GHG 1.10 Organization of GHG Reduction Plan

The information in this Chapter describes the purpose and goals of the GHG Reduction Plan, its relationship to the County General Plan, a description of GHG emissions, the regulatory background and a summary of California emissions. Chapter 2 of this Plan details the inventories of the GHG Reduction Plan; Chapter 3 sets forth the County's reduction target; Chapter 4 discusses the reduction goals, objectives and strategies to reduce GHG emissions; and, Chapter 5 describes the implementation steps. The following Appendices provide technical support for the GHG Plan: Appendix A, External Inventory/Reduction Measure Methodology; Appendix B, Internal Inventory/Reduction Measure Methodology; Appendix C, General Plan Policies; Appendix D, SCAQMD Inventory; Appendix E, a 2030 Analysis; Appendix F, GHG Screening Tables and Methodology for Determining Project Unmitigated and Mitigated GHG Emissions.



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CHAPTER 2.0

INVENTORY

GHG 2.1 Inventory Methodology

As discussed in the previous chapter, the County can influence GHG emissions in two distinct ways: (1) through the exercise of its land use authority it can affect community/external emissions; (2) through its management of County government and facilities it can affect municipal/internal emissions. As a consequence, two separate emission inventories were prepared for the County's GHG Plan: an External Inventory and an Internal Inventory.

The External Inventory includes GHG emissions from land uses within the County's unincorporated areas where the County has jurisdictional land use authority (the "External Inventory"). The External Inventory also includes GHG emissions generated outside the County that are the result of service and operation demands from land uses located within the County's unincorporated area.

The Internal Inventory includes GHG emissions associated with the County's provision of services and internal operations (the "Internal Inventory"). The Internal Inventory includes emissions that occur within the unincorporated County (where County facilities and operations are located and/or take place in unincorporated areas) as well as emissions that occur outside the unincorporated County (where County facilities and operations are located and/or take place in other jurisdictions). The intent of the Internal Inventory is to identify all GHG emissions related to County government operations.

The two inventories partially overlap. As noted above, some of the County government facilities and operations are located or occur within the unincorporated County area and some are not (e.g. are located or occur within the incorporated cities or outside the County). Thus, some of the County government emissions are included within the External Inventory. As a result, the two inventories cannot be added together as that would double-count the County Government emissions that occur within the unincorporated area. Instead the County has decided to track External and Internal emissions separately, in order to clearly identify the influence of the County over both the External Inventory and the Internal Inventory over time. Reduction measures identified within this Plan address both sources of GHG emissions. Where appropriate, GHG reduction measures that affect both Internal and External GHG emissions (such as for landfill methane controls), are included in both the Internal and External parts of the Plan.

The inventories and the methodology used to prepare the inventories are more fully described in Appendices A and B, to this Plan.

The unit of measure used throughout this GHG Reduction Plan is the metric ton of carbon dioxide (CO₂) equivalent (MTCO₂e). This is the international unit that combines the differing

impacts of all greenhouse gases into a single unit, by multiplying each emitted gas by its global warming potential (GWP). GWP is the measure of how much a given mass of greenhouse gas contributes to global warming. GWP compares the relative warming effect of the GHG in question to that of carbon dioxide.¹

The External Inventory includes a current year inventory and a 2020 year inventory. The year 2007 (referred to as the “Current” year inventory, or “2007” inventory, for the External Inventory) was selected as the current year for the External Inventory as it was the most recent year with the necessary data to perform a comprehensive inventory. The 2020 inventory is an unmitigated emissions projection² based on current energy consumption and unit emission rates adjusted by sector-specific growth rates or based on CARB’s 2020 forecast inventory growth rates without taking into account the effect of any state, regional, or local GHG reduction measures (CARB 2009).

The Internal Inventory also includes a current year inventory and a 2020 year inventory. Fiscal year July 1, 2006, to June 30, 2007 (referred to as the “Current” year inventory, “2007” inventory, for the Internal Inventory) was selected as the current year for the Internal Inventory because it represents the most recent year with the necessary data to perform a comprehensive inventory. A number of widely accepted protocols for estimating GHG emissions were used to prepare the County’s Internal and External inventory. The major protocols used are:

- *California Air Resources Board (CARB) Local Governments Operations Protocol (LGOP) (2008)*. This protocol is the standard for estimating emissions resulting from government buildings and facilities, government fleet vehicles, wastewater treatment and potable water treatment facilities, landfill and composting facilities, and other operations.
- *California Climate Action Registry (CCAR) and General Reporting Protocol (2009)*. This protocol provides guidance for preparing GHG inventories in California.
- *CARB California Greenhouse Gas Inventory Data 1990–2006 (2009)*. CARB’s documentation provides background methodology, activity data, protocols, and calculations used for California’s statewide inventory.
- *California Energy Commission (CEC) Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (2006)*. This inventory provides useful methodology and emission factors for statewide GHG emissions inventorying.
- *U.S. Environmental Protection Agency (USEPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007 (2009)*. This inventory provides useful methodology and emission factors for nationwide GHG emissions inventorying.
- *Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006)*. This document is the international standard for

¹ The GWP of CO₂ is, by definition, one (1). The GWP values, based on Intergovernmental Panel on Climate Change (IPCC guidance) used in this Plan are as follows: CO₂ = 1, Methane (CH₄) = 21, Nitrous Oxide (N₂O) = 310.

² Some refer to an unmitigated forecast as a “Business as Usual” or BAU forecast. In this plan, such forecasts are referred to as an “unmitigated emissions forecast.”



inventories and provides much of the baseline methodology used in the national and statewide emission inventories.

The County utilized the approach employed by the Local Government Operations Protocol (LGOP), which categorizes local government emission sources as Scope 1 (direct), Scope 2 (indirect), and Scope 3 (other indirect). The LGOP defines these emissions as follows:

- Scope 1:** All direct GHG emissions (with the exception of direct CO₂ emissions from biogenic sources).
- Scope 2:** Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.
- Scope 3:** All other indirect emissions not covered in Scope 2 that are not under the control or influence of the local government, such as the emissions resulting from the extraction and production of purchased materials and fuels, and transport-related activities in vehicles not owned or controlled by the reporting entity.

Scope 1 and 2 emissions were quantified and included in both the Internal and External Inventories. For example, direct emissions associated with onsite natural gas and fuel oil use are included in Scope 1 because these emissions occur in the unincorporated area and are subject to the County's influence or control. Indirect GHG emissions associated with electricity use are included in Scope 2, since these emissions can occur outside of the unincorporated area, but are subject to the County's influence or control. Several Scope 3 emissions were also quantified for certain emission sources (such as rail emissions and high global warming potential gases for informational purposes but not included in the External Inventory. Scope 3 emissions include emissions that the County does not influence or control but that occur in relation to activity in the unincorporated area of the County³.

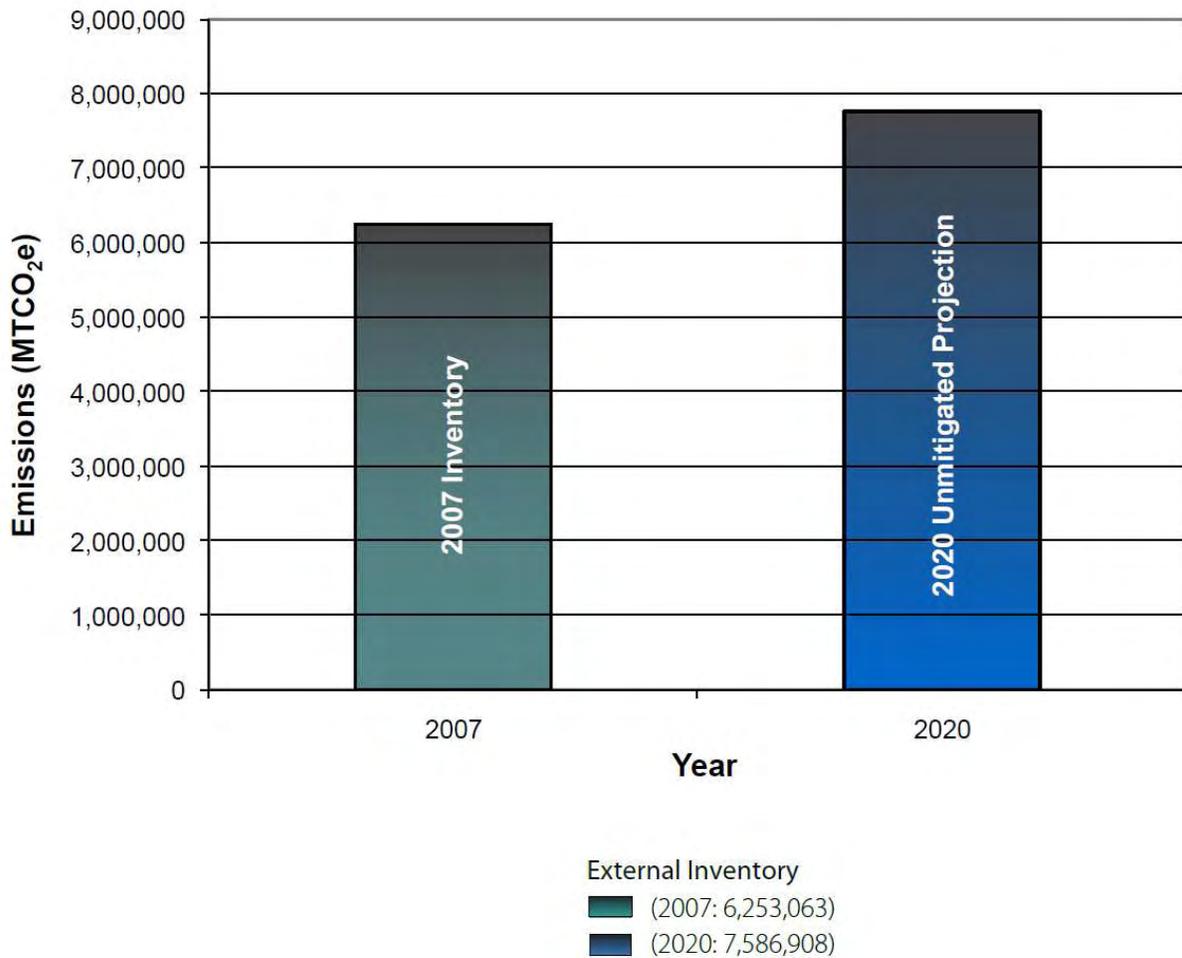
³ See Appendix A for additional information relating to Scope 3 emissions

GHG 2.2 External Inventory

GHG 2.2.1 Total External Emissions

The County’s Current and 2020 External Inventory emissions are 6,253,063 MTCO₂e and 7,586,908 MTCO₂e, respectively (see **Figure 2-1** below). The projected 2020 emissions are not adjusted to reflect adopted or future legislation that will result in statewide GHG emissions reductions.

Figure 2-1: External Inventory of GHG Emissions (Current –2020)



GHG 2.2.2 Sector-Specific Analysis of the External Emissions

Although there are no sector-specific reduction goals outlined in AB 32, the County’s sector-specific inventories and analysis provide a useful metric to gauge the County’s progress towards achieving its aggregated 2020 emissions reduction goal.



The following emissions sectors are included in the External Inventory. The data source for each emission sector is also included.

- *Stationary Sources*: cement plants, fuel combustion, industrial process emissions etc. Data provided by the South Coast Air Quality Management District (SCAQMD) and by the California Air Resources Board (CARB) (See Appendix A and Appendix D).
- *Transportation (on-road and off-road)*. Data provided by SCAQMD (See Appendix A and Appendix D).
- *Energy End-Use*: (See Appendix A for specific data sources)
 - *Industrial*: natural gas and electricity consumption for the industrial sector. Data provided by utilities (See Appendix A);
 - *Residential*: natural gas and electricity consumption for the residential sector. Data provided by utilities; and,
 - *Commercial*: natural gas and electricity consumption for the commercial sector. Data provided by utilities.
- *Solid Waste/Landfills*: methane emissions from landfilled waste. Data provided by the County's Solid Waste Management Department, (SWMD), the California Integrated Waste Management Board (CIWMB), and the United States Environmental Protection Agency (USEPA). (see Appendix A).
- *Agriculture*: enteric fermentation and manure management from dairy operations. Data provided by the SCAQMD Countywide inventory (See Appendix A and Appendix D).
- *Water-Related*:
 - *Wastewater*: fugitive emissions from domestic wastewater treatment. Data provided by CARB (See Appendix A).
 - *Water Conveyance*: electricity consumption associated with water importation. Data provided by the CEC (See Appendix A).
- *Miscellaneous*: GHG emissions associated with residential from residential fireplaces and outdoor cooking.

The sector-specific Current Year emissions for the External Inventory are presented in **Table 2-1**. Accounting for projected population and economic growth, unmitigated projected External Inventory emissions in 2020 are also presented in **Table 2-1**. In descending order of magnitude, External emissions sources are dominated by stationary sources, followed by on-road transportation, industrial sources, residential energy consumption, commercial energy consumption, landfill waste, off-road transportation, agriculture, wastewater, water conveyance, and miscellaneous emissions.

Table 2-1: San Bernardino County External Emissions Summary

Current External Inventory and Unmitigated 2020 Projections (MTCO₂e)					
Sector		Current		2020	
		Emissions	Percent	Emissions	Percent
Stationary Sources		2,866,435	45.8	3,173,592	41.8
Transportation:	On-road	1,631,666	26.1	2,176,132	28.7
	Off-road	157,185	2.5	235,054	3.1
Building Energy Use:	Industrial	593,716	9.5	760,834	10.0
	Residential	440,851	7.1	467,217	6.2
	Commercial	246,364	3.9	314,603	4.1
Solid Waste/Landfills		213,191	3.4	359,318	4.7
Agriculture		64,619	1.0	50,991	0.7
Water-Related:	Wastewater	27,994	0.4	35,525	0.5
	Water Conveyance	10,696	0.2	13,211	0.2
Miscellaneous: Residential fires and cooking		346	0.01	431	0.01
Total		6,253,063	100	7,586,908	100

Stationary source emissions in San Bernardino County are substantially different compared to more industrialized counties like Los Angeles County. Cement plants constitute approximately 95 percent of the stationary source emissions in San Bernardino County, and represent nearly one half (45.8%) of all external emissions. There are 11 cement plants located in California, four are located in San Bernardino County, three of which are located in the unincorporated area of the County. These three cement plants represent approximately 30 percent of GHG emissions from cement production in California⁴.

⁴ See Appendix A.

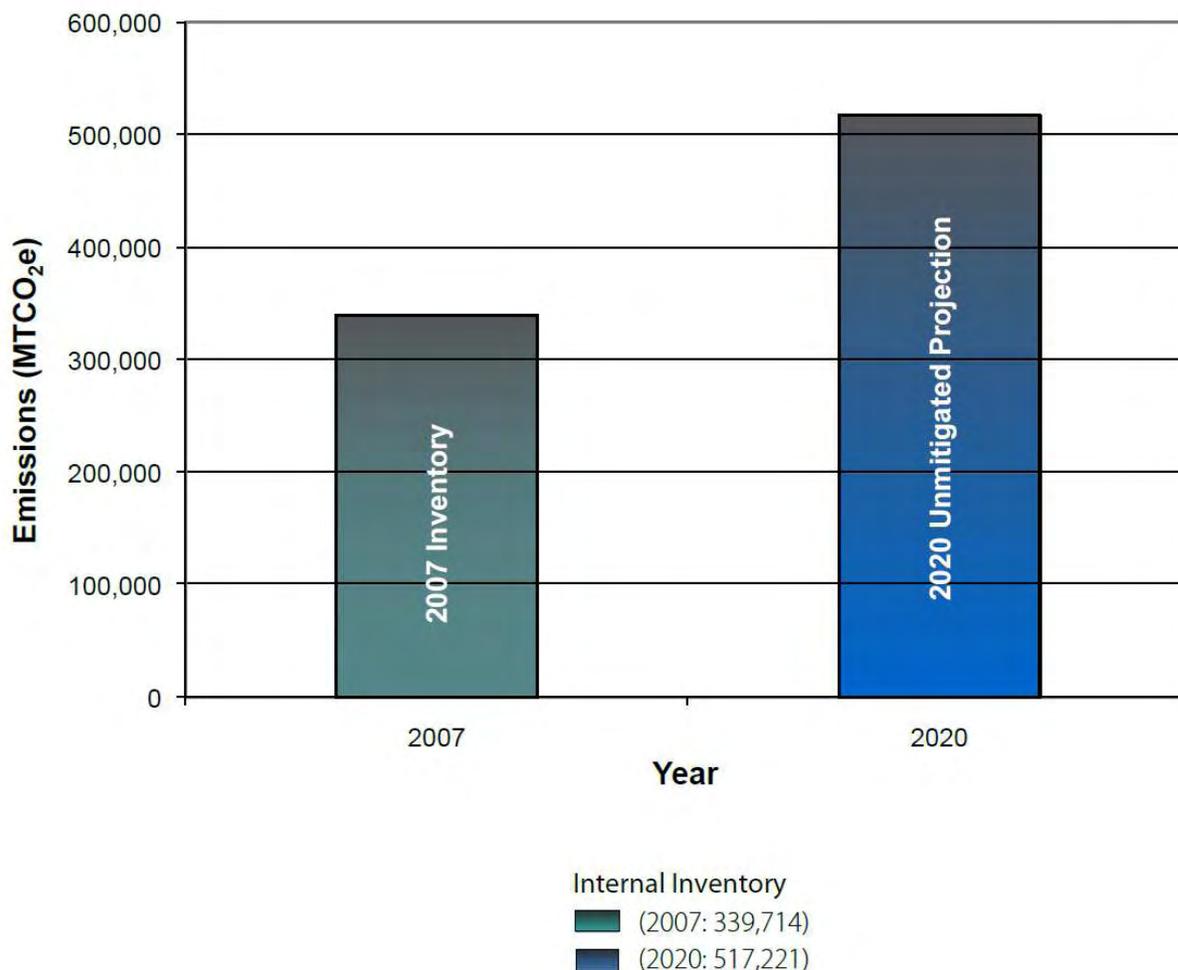


GHG 2.3 Internal Inventory

GHG 2.3.1 Total Internal Emissions

The County’s Current and 2020 Internal Inventory emissions are 339,714 MTCO₂e and 517,221 MTCO₂e⁵, respectively (See **Figure 2-2** below). The projected 2020 emissions are not adjusted to reflect recent legislation that will result in statewide GHG emissions reductions.

Figure 2-2: Internal Inventory of GHG Emissions (Current –2020)



GHG 2.3.2 Sector-Specific Analysis of the Internal Inventory Emissions

The following emissions sectors are included in the Internal Inventory (see Appendix B for detailed discussion of data sources and assumptions).

⁵ Internal emissions are shown as thousand metric tons and External emissions are shown as million metric tons.

- *County Facilities*: natural gas and electricity consumption for County-owned and operated facilities.
- *Water Pumping and Wastewater Treatment*: natural gas and electricity consumption for County-owned and operated water pumping and treatment facilities.
- *Outdoor Lighting*: electricity consumption for County-owned and operated outdoor lighting.
- *County Vehicle Fleet*: fuel consumption for County fleets.
- *Solid Waste/Landfills*: methane emissions from landfilled waste.
- *Employee Commute*: fuel consumption for County employees commuting to and from work.

The data in the Current year inventory is based on information gathered from County departments, the County General Plan, California Integrated Waste Management Board (CIWMB), and United States Environmental Protection Agency (USEPA). The 2020 inventory is a projection of unmitigated emissions based on current energy consumption and unit emission rates adjusted by sector specific projected growth rates.

The County's sector-specific Current year and 2020 GHG emissions are presented in **Table 2-2** below. In descending order of magnitude, the County's emissions sources are dominated by solid waste, County facilities, County fleet, employee commute, water pumping and wastewater treatment, and outdoor lighting.

Table 2-2: San Bernardino County Internal Emissions Summary

Current Internal Inventory and 2020 Unmitigated Emissions Projections (MTCO₂e)				
Sector	Current		2020	
	Emissions	Percent	Emissions	Percent
Solid Waste/landfills	206,817	60.9	342,480	66.2
County Facilities	62,981	18.5	84,915	16.4
County Vehicle Fleet	34,958	10.3	42,526	8.2
Employee Commute	32,490	9.6	42,869	8.3
Water Pumping and Wastewater Treatment	2,192	0.7	4,114	0.8
Outdoor Lighting	276	0.1	317	0.1
Total	339,714	100	517,221	100

Source: ICF International, Inc., 2009



CHAPTER 3.0

2020 GHG REDUCTION TARGET

GHG 3.1 The 2020 GHG Reduction Target

GOAL: Reduce Current Greenhouse Emissions from activities over which the County has jurisdictional and operational control by at least 15% by 2020.

The County’s GHG Reduction Plan and its reduction goal are based on AB 32 and CARB’s recommendations to ensure California GHG emissions are less than 1990 GHG emissions by the year 2020.

“ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today’s levels by 2020 to ensure that their municipal and community-wide emissions match the State’s reduction target” (AB32 Scoping Plan 2008, p. ES-5).

The County’s External and Internal GHG Inventories form a benchmark and projected unmitigated 2020 inventory from which the County has established its reduction target. The County’s External Inventory of GHG emissions for the Current (2007) year is 6,253,063 MTCO_{2e}. The County’s Internal Inventory of GHG emissions for the Current (2007) year is 339,714 MTCO_{2e}. As discussed in Chapter 2 “*Inventory*”, page 2-1, the two inventories overlap in part and are exclusive in part and cannot be simply added to each other accordingly.

Tables 3-1 and 3-2 show the total emissions by sector for the External and Internal Inventories, respectively.

Figure 3-1: External Emissions By Sector

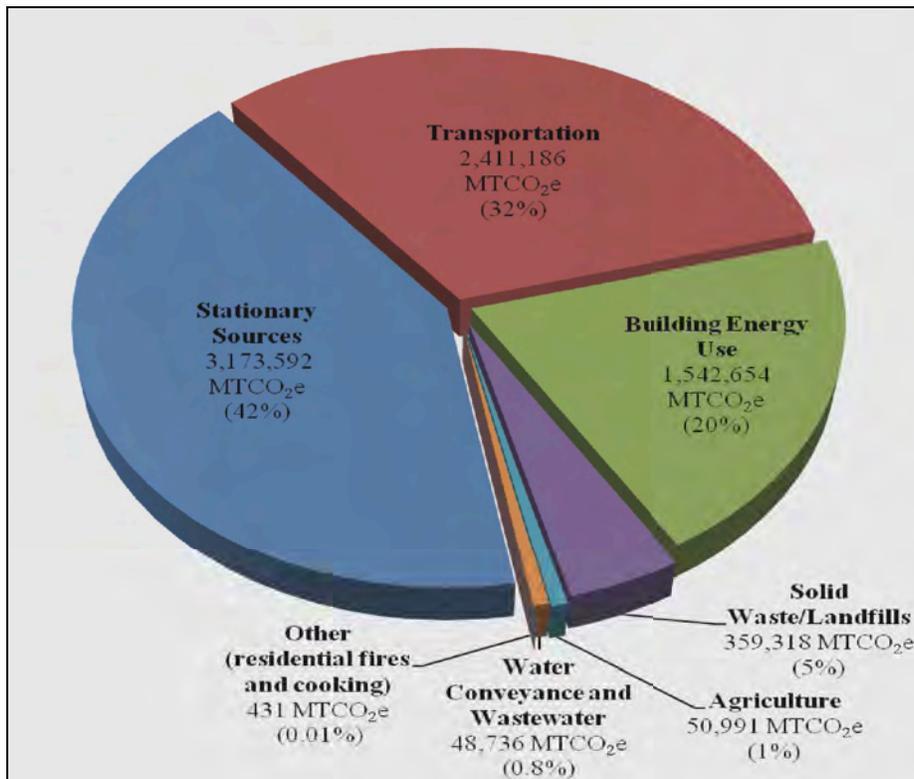
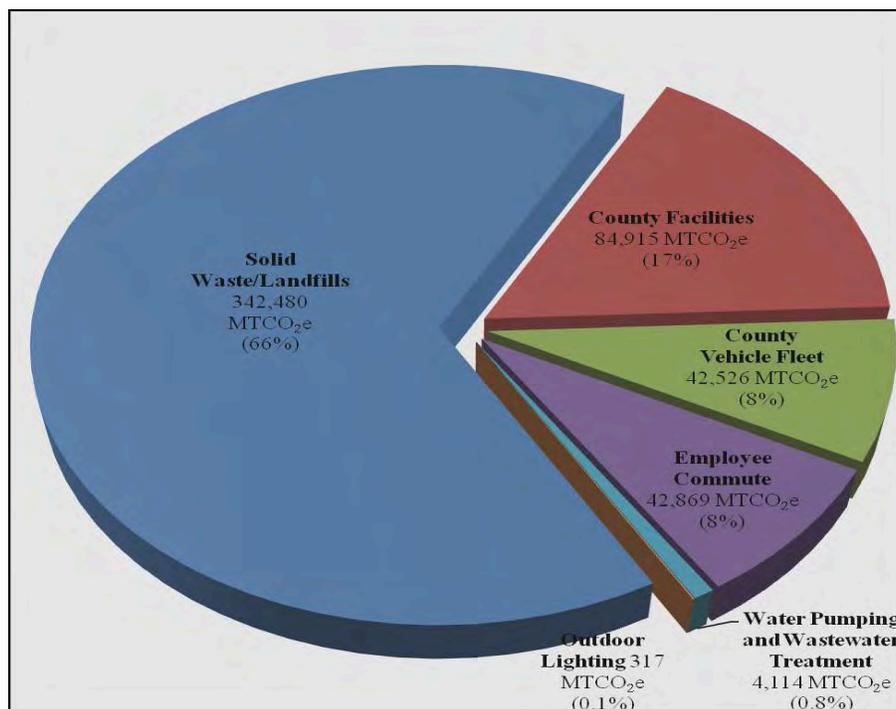
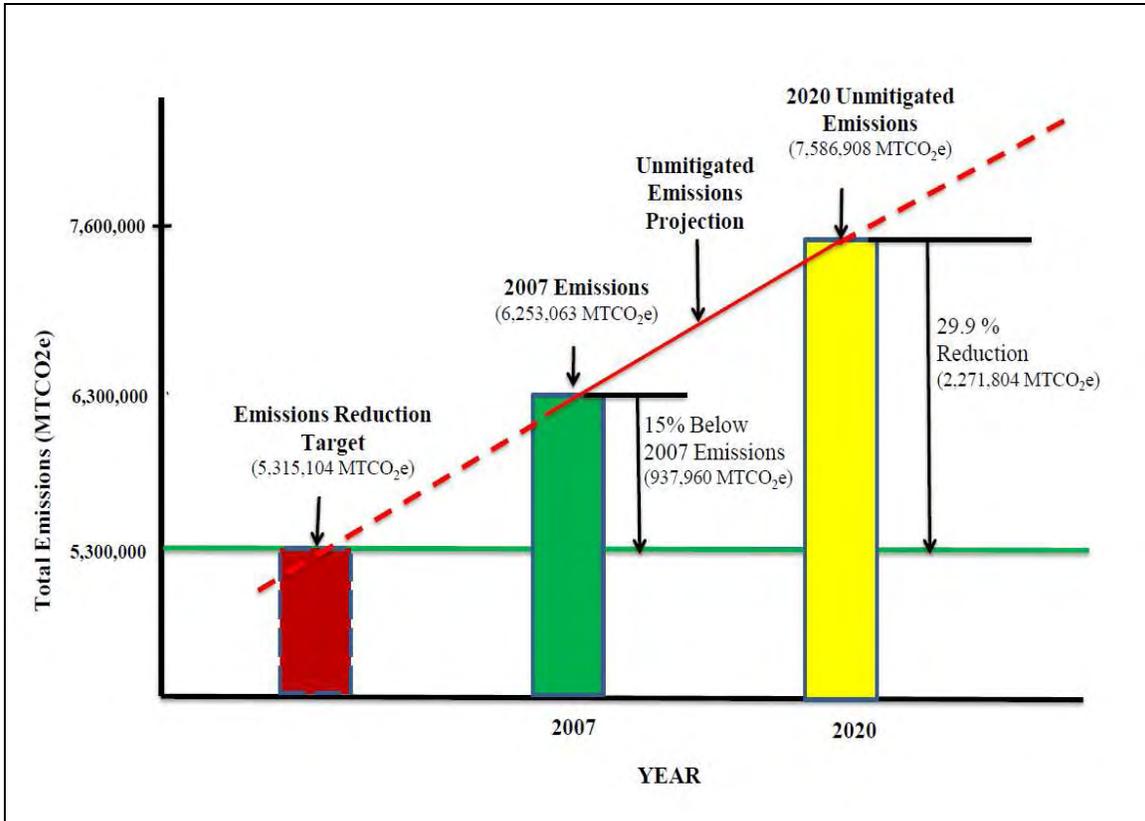


Figure 3-2: Internal Emissions By Sector



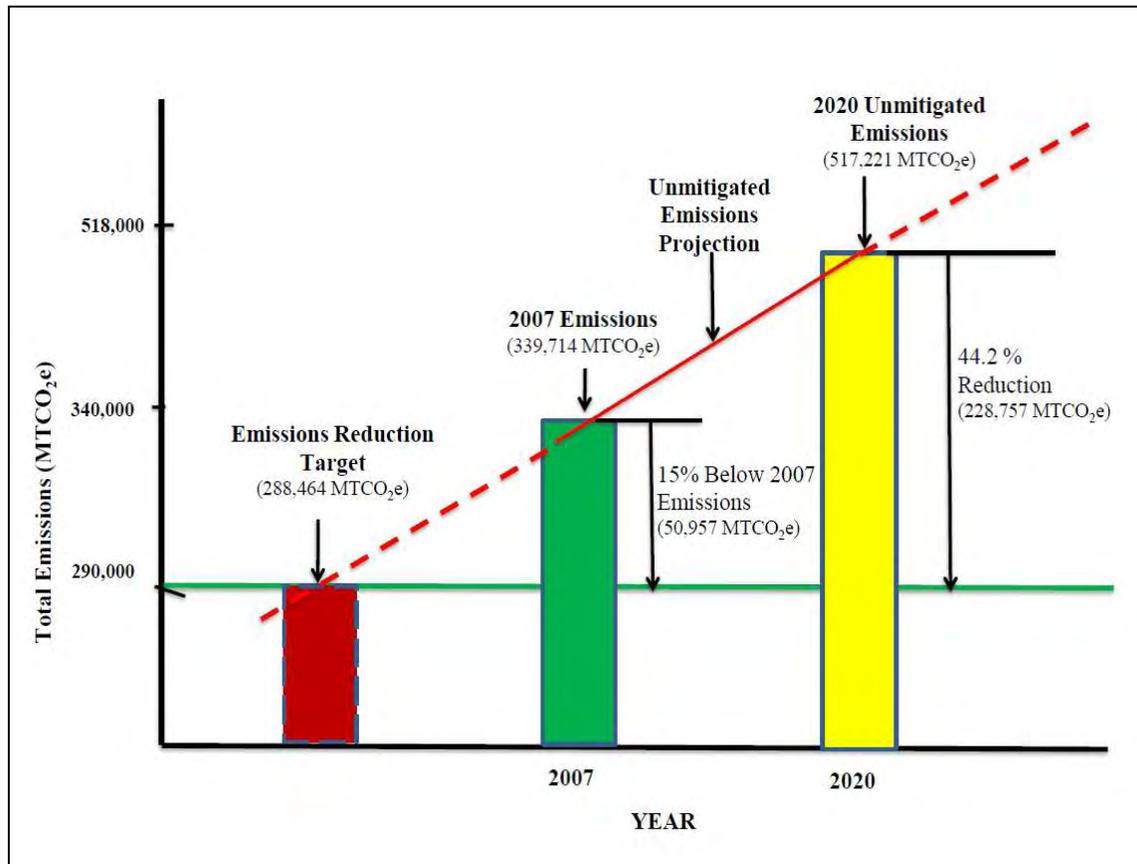
The County's 2020 goal is to decrease both the External and Internal Inventories of emissions to a level at least 15% below Current (2007) year emissions. To achieve this goal, by 2020 the External Inventory will be reduced by approximately 2,272,000 MTCO₂e (compared to 2020 unmitigated levels) to a level of approximately 5,315,000 MTCO₂e as shown in **Figure 3-3**. This constitutes a reduction of approximately 30 percent.

Figure 3-3: External Emissions Inventory and Reduction Targets



The County's goal is also to reduce its 2020 Internal Inventory by approximately 229,000 MTCO₂e (compared to 2020 unmitigated levels) to a level of 289,000 MTCO₂e. This constitutes a total of approximately 42 percent.

Figure 3.4: Internal Emissions Inventory and Reduction Targets



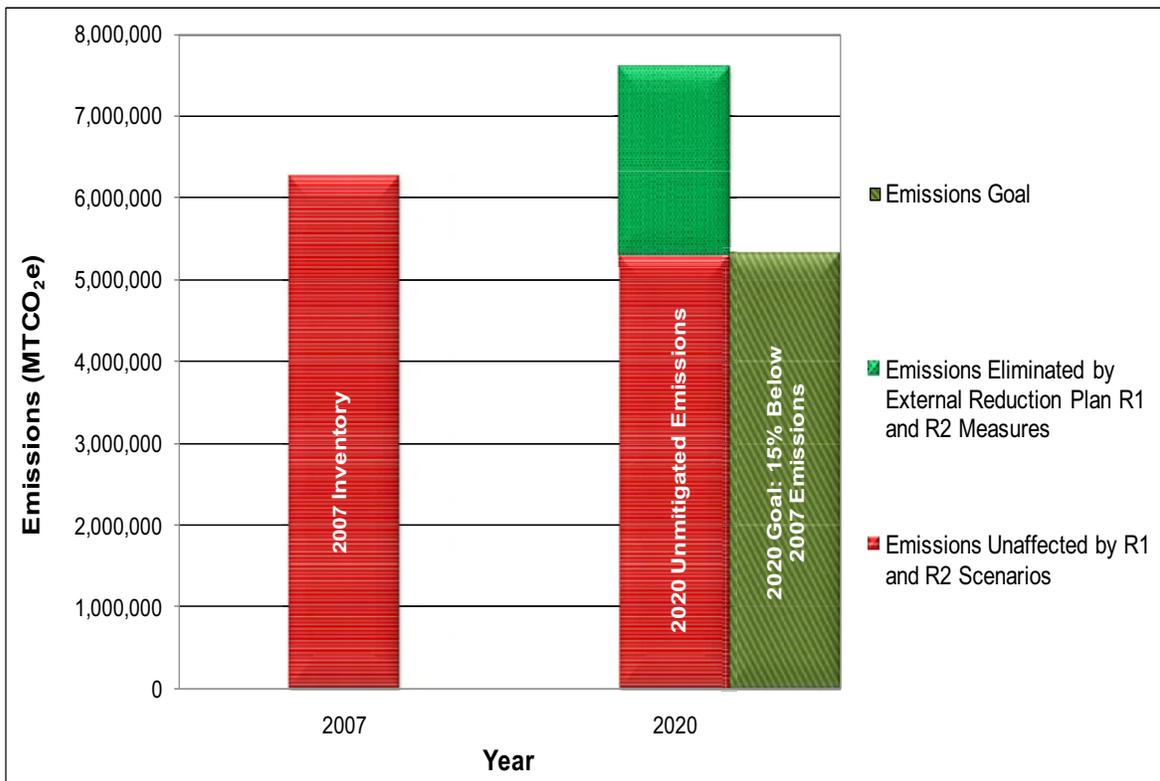


GHG 3.2 External Inventory of GHG Emissions - Projection and Target

The Current (2007) External Inventory, 2020 unmitigated emission projections and the 2020 reduction target are presented in Figure 3-5. This figure also shows 2020 emissions after taking into account the reduction measures described in Chapter 4. Together, the sum of these reduction measures achieves slightly more emissions reductions than necessary to meet the 2020 emissions target.

Unmitigated emissions are expected to increase from 6,253,063 MTCO₂e in 2007 to 7,586,908 MTCO₂e in 2020 due to growth in population, the number of households and jobs, increase in vehicle travel, solid waste production, and industrial activity in the County, among other factors. However, the reduction measures included in this Plan will reduce emissions by 2,290,874 MTCO₂e (approximately 30.2 percent) compared to these unmitigated projections. Reduction measures include both state and local measures. Implementation of all measures identified in this Plan will reduce projected 2020 emissions approximately 15.3% below 2007 emissions.

Figure 3-5: External Inventory, Current, 2020 Unmitigated, and 2020 Mitigated Emission Levels, with Reduction Goal

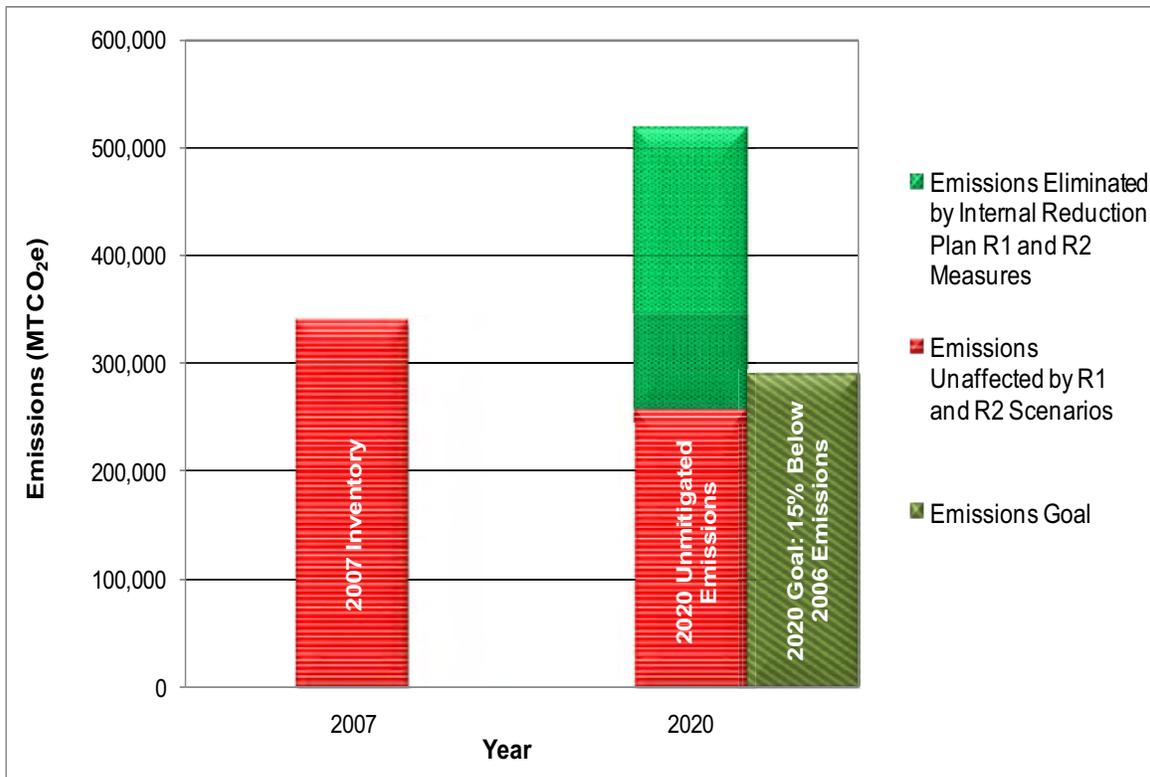


GHG 3.3: Internal Inventory of GHG Emissions – Projection and Target

The Current (2007) Internal Inventory, 2020 unmitigated emission projections and the 2020 goal are presented in Figure 3-6. This figure also shows 2020 emissions after taking into account the reduction measures described in Chapter 4. Together, the sum of these reduction measures achieves more emissions reductions than necessary to meet the 2020 emissions target. The majority of these reduction measures are local measures, requiring County action to achieve the associated emissions reductions.

Unmitigated emissions estimates are expected to increase from 339,714 MTCO₂e in 2007 to 517,221 MTCO₂e in 2020 due to growth in building energy use, County vehicle fleets, new waste being deposited in County-owned landfills, and the number of County employees. However, the reduction measures included in this Plan will reduce emissions by 260,692 MTCO₂e (50.4 percent) from unmitigated projections. With implementation of the state and local measures identified in this Plan, 2020 emissions will be approximately 24 percent lower than 2007 emissions, substantially exceeding the 2020 goal of 15 percent below current emissions.

Figure 3-6: Internal Inventory, Current, 2020 Unmitigated and 2020 Mitigated Emission Levels, with Reduction Goal





CHAPTER 4.0

GHG REDUCTION GOALS, OBJECTIVES AND STRATEGIES

GHG 4.1 ATTAINING THE REDUCTION TARGET

The County's goal is to reduce its External Inventory of emissions by 2020 to approximately 5,315,000 MTCO₂e, requiring a reduction of approximately 2,272,000 MTCO₂e compared to 2020 unmitigated emissions. It is also the County's goal to reduce its Internal Inventory of emissions by 2020 to approximately 289,000 MTCO₂e, requiring a reduction of approximately 229,000 MTCO₂e compared to 2020 unmitigated emissions.

The purpose of this Chapter is to describe the reduction strategies currently being employed by the County, as well as those that will be employed by the County and the State, many of which are quantifiable. Existing and newly implemented strategies in place through the various County departments will help reduce the countywide GHG emissions level. In addition, proposed new private developments will also contribute to GHG emissions reduction through the County's GHG development review process, AB 32 requirements, and other state initiatives.

External Inventory emission reductions are classified into the following six sectors: Building Energy (including both Energy Efficiency and Alternative Energy), Transportation and Land Use, Solid Waste/Landfills, Stationary Sources, Agriculture and Resources Conservation, and Water Conservation. Internal Inventory emission reductions are classified into the following four sectors: Building/Energy, Fleet/Fuel, Solid Waste/Landfills and, Employee Commute. For each sector, reduction strategies have been developed to achieve the County's 2020 emissions reduction target.

The External Inventory is projected to reach 7,586,908 MTCO₂e by 2020 if unmitigated. With the State and County strategies described in this Chapter, the projected 2020 External Inventory of emissions will be reduced to 5,296,034 MTCO₂e, a level 15.3 percent less than the 2007 External Inventory emissions. The projected 2020 unmitigated Internal Inventory of emissions will be reduced by 260,692 MTCO₂e, to a level approximately 24 percent less than 2007 Internal Inventory emissions.

Figure 4-1 and **Table 4-1** summarize the reductions that will be achieved for the External Inventory, by emissions sector. External Inventory reductions were identified from the following sectors: Stationary Sources (46%); Transportation and Land Use (23%); Building energy (22%); Solid Waste Landfills (9%); Water conservation (0.4%); and Agriculture & Resource Conservation (0.1%).

Figure 4-1: 2020 External Emissions Reduction Summary (MTCO₂e)

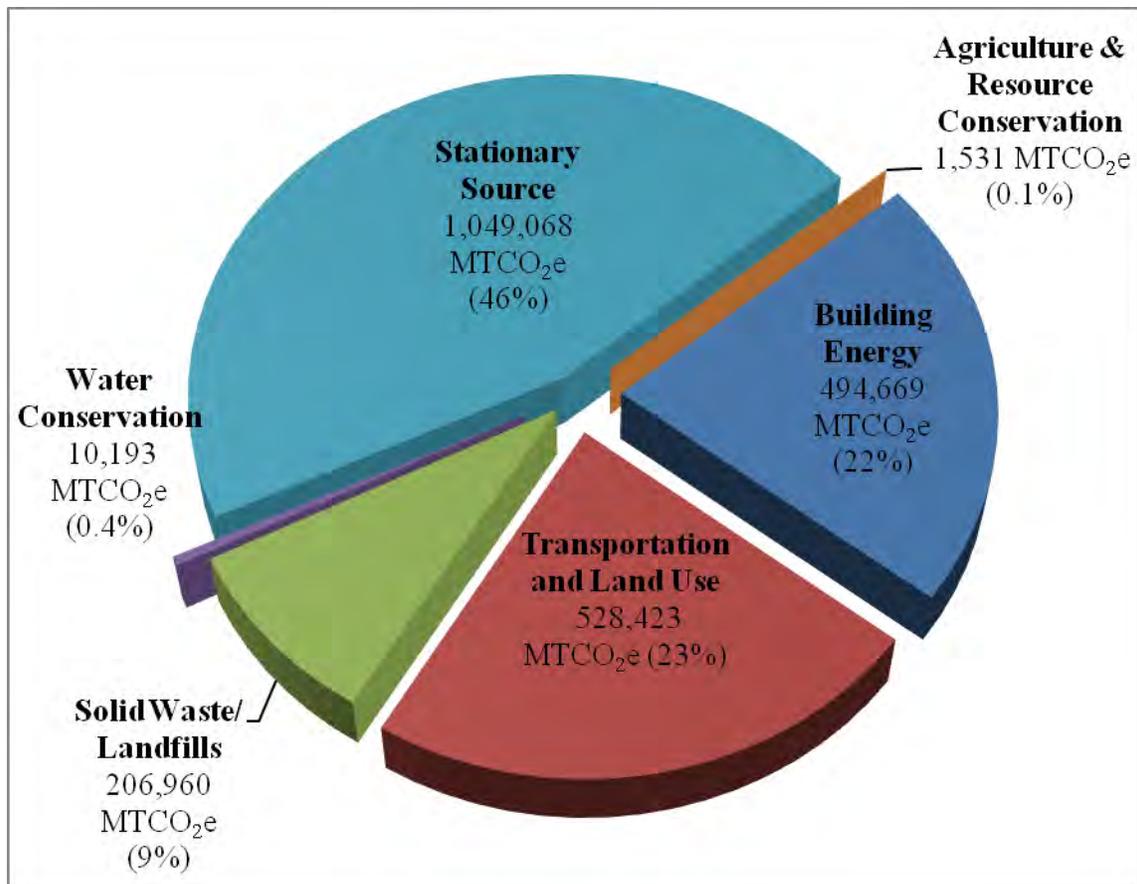


Table 4-1: Summary of External Emissions Reduction by Sector

Sector	2020 Reduction (MTCO ₂ e)		
	State Strategies	County Strategies	Total
Building Energy			
Energy Efficiency	167,129	70,691	237,820
Alternative Energy	168,117	88,761	256,879
Transportation and Land Use	486,157	42,266	528,423
Solid Waste/Landfills ¹	--	206,960	206,960
Stationary Source	1,049,068	0	1,049,068
Agriculture & Resource Conservation	1,531	0	1,531
Water Conservation	2,007	8,186	10,193
Total	1,874,009	416,864	2,290,874

Figure 4-2 and Table 4-2 summarize the reductions that will be achieved for the Internal Inventory, by emissions sector. Internal Inventory emissions reductions were identified

¹ Refer to Chapter 2, page 2-1, regarding overlap between Internal and External inventories.



from the following sectors: solid waste/landfills (79%), building/energy use (13%), fleet/fuel (6%), and employee commute (2%).

Figure 4-2: 2020 Internal Emissions Reduction Summary

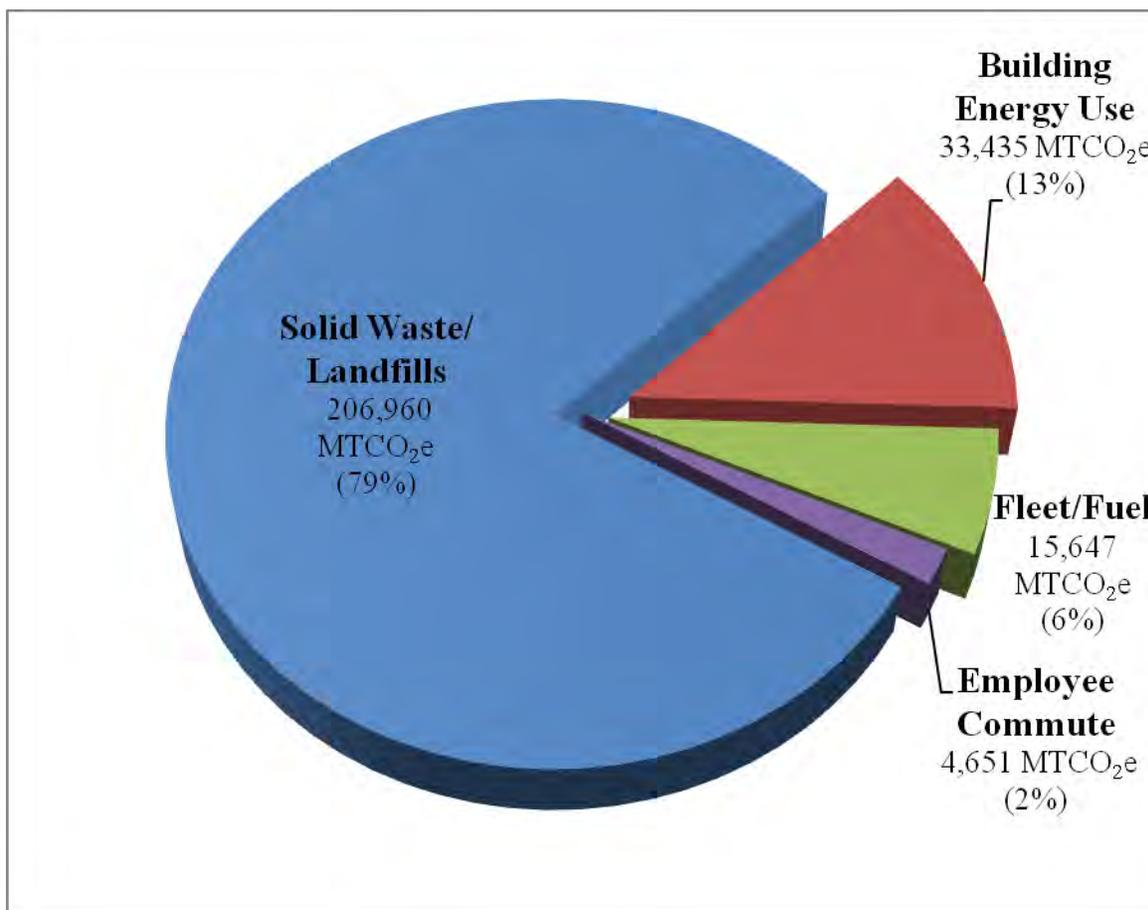


Table 4-2: Summary of Internal Reductions by Sector

Sector	2020 Reduction (MTCO ₂ e)		
	State Strategies	County Strategies	Total
Solid Waste/Landfills ²	0	206,960	206,960
Building Energy Use	15,892	17,543	33,435
Fleet/Fuel	11,179	4,467	15,647
Employee Commute	0	4,651	4,651
Total	27,071	233,621	260,692

² Refer to Chapter 2, page 2-1, regarding overlap between Internal and External inventories.

RELATIONSHIP OF REDUCTION STRATEGY TO REDUCTION MEASURES

The reduction strategies discussed in the GHG Plan (reduction strategies) correspond to the reduction measures described in Appendix A for the External Inventory and Appendix B for the Internal Inventory (reduction measures). For purposes of this GHG Plan, the term “reduction strategy” and “reduction measure” have the same meaning. Following the description of each County implemented GHG Plan reduction strategy, is a specific reference to the corresponding reduction measure found in the Appendices. Where the reduction strategy is quantified, the amount of emissions reduction and methodology is set forth in the Appendices A and B.

The reduction strategies are consistent with one or more existing County General Plan policies and programs and/or Development Code requirements. Relevant County General Plan policies are identified under each sector and listed in Appendix C.

REDUCTION MEASURE CLASSIFICATION

The emission reduction measures included in this Plan include existing and proposed state, regional, county, and other local measures that will result in GHG emissions reductions in the County’s External and Internal inventories. The emission reduction measures are organized as follows, for each sector:

1. Reduction Class 1 (R1) includes all adopted, implemented, and proposed state and regional measures that do not require additional County action and that will result in quantifiable GHG reductions for the County’s LUA³ area and internal operations. These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.
2. Reduction Class 2 (R2) includes all quantifiable measures that have been implemented or will be implemented by the County, as well as any additional quantifiable measures that require County action and will further reduce the GHG emissions for the County’s LUA area and internal operations. R2 also includes any state and regional measures that require substantial action by the County to achieve the expected GHG reductions.

The R2 measures include specific quantifiable measures as well as reductions achieved through the development review process.

Measurable reductions of GHG emissions will be achieved through the County’s GHG Development Review Process (DRP) by applying appropriate reduction requirements as part of the discretionary approval of new development projects. Through its development review process, the County will implement CEQA requiring new development projects to quantify project GHG emissions and adopt feasible mitigation to reduce project emissions below a level of significance. Mitigation of GHG emissions impacts through the DRP provides one of the most substantial reduction strategies for reducing external emissions. The DRP procedures for evaluating GHG impacts and determining significance for CEQA

³ The County’s discretionary land use authority, as well as its ministerial building permit authority are collectively referred to herein as “Land Use Authority” or “LUA.”



purposes will be streamlined by (1) applying a uniform set of performance standards to all development projects, and (2) utilizing Screening Tables to mitigate project GHG emissions. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions. A review standard of 3,000 metric tons per years (MTY) will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions. The review standard of 3,000 MTY and the Screening Tables are described in Appendix F.

As part of the implementation of the County GHG Plan, a uniform set of performance standards will be applied to development projects. These performance standards will be added to the County Development Code to ensure consistent application during development review. The complete Development Review Process, including the use of performance standards, for assessing and mitigating GHG emissions is outlined below.

- a) **County Performance Standards.** All development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 MTCO_{2e} per year will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Performance Standards and the methodology relating to the 3,000 MTCO_{2e} per year level.)
- b) **Regulatory Agency Performance Standards.** When, and if, South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.
- c) **Projects Using Screening Tables.** For projects exceeding 3,000 MTCO_{2e} per year of GHG emissions, the County will develop Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding⁴. Projects that garner a 100 or greater points would not require quantification of project specific GHG emissions. The point system will be devised to ensure project compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those from existing development, will allow the County to meet its 2020 target and support longer-term reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Screening Tables and methodology.)

⁴ The Screening Tables, attached as Appendix F to this Plan, are substantially similar to the Screening Tables to be used by the County.



- d) Projects Not Using Screening Tables. Projects exceeding 3,000 MTY of GHG emissions that do not use the Screening Tables, will be required to quantify project specific GHG emissions or otherwise demonstrate that project specific GHG emissions achieve the equivalent level of GHG emissions efficiency as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Appendix F for a full description of the Screening Tables.)
- e) Residential Projects Located Outside City Sphere of Influence. Residential Projects (or mixed use projects with a residential component) in excess of 250 dwelling units that are located in unincorporated area not within a City Sphere of Influence (SOI) will not be eligible to use the Screening Tables or rely on the Plan for a determination of less than significant on individual or cumulative impact for GHG emissions. These projects must perform an independent project-specific evaluation of GHG emissions and present project-specific conclusions regarding significance of GHG emissions impacts. (See Appendix F for a full description of the mitigation analysis and methodology for these projects.)
- f) Projects Requiring EIR. This process shall not be construed as limiting the County's authority to require an EIR and if needed to adopt a statement of overriding consideration for projects with significant GHG Impacts.

The County will monitor the emissions reductions from new development, calculate those emissions and make any needed modifications to the County's reduction strategies to enable the County to reach its 2020 target.

- 3. Reduction Class 3 (R3) includes all other measures that have been implemented or will be implemented by the County which were not quantified, but are included in the County's GHG Plan. These measures are either facilitative in nature or there are methodological issues that prevent their quantification at this time. The R3 measures were not used to demonstrate achievement of the proposed County 2020 GHG emissions reduction target. Some of these measures (such as education or financing programs) are necessary to facilitate their success, but do not have separately quantifiable benefit from the R2 measures they support. Other measures may contribute to additional GHG reductions, but lack data or protocols for quantification.

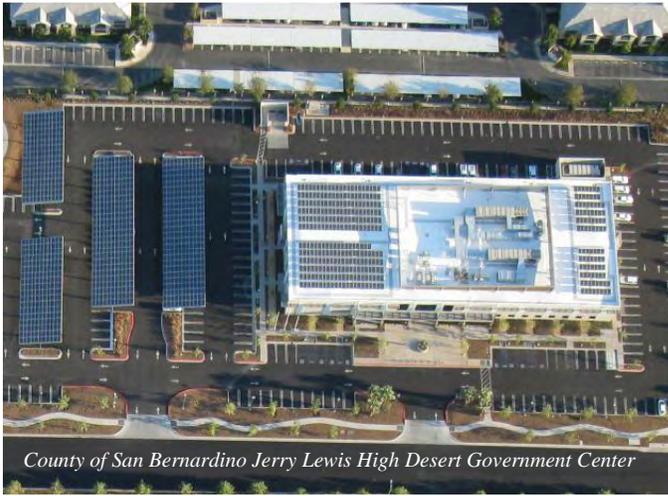
No federal measures were relied upon to achieve the reduction targets included in this plan due to the uncertainty surrounding federal action at this time.

GHG 4.2 EXTERNAL GHG EMISSIONS

REDUCTION GOALS, OBJECTIVES AND STRATEGIES

The County's External GHG Emissions reduction goals, objectives, and strategies are categorized into the following six sectors discussed below: Building Energy (including both Energy Efficiency and Alternative Energy), Transportation and Land Use, Solid Waste/Landfills, Stationary Sources, Agriculture and Resource Conservation, and Water Conservation.

GHG 4.2.1 BUILDING ENERGY SECTOR



The Building Energy sector includes and addresses energy efficiency and alternative energy use in buildings, and renewable energy generation facilities.

Building energy use results in GHG emissions associated with electricity and natural gas use. Concurrent with the rise in demand for more energy has been the demand for more efficient production, distribution and use. By promoting efficiency and

alternative energy use in existing and new buildings, the demand for electricity and natural gas can be reduced and the GHG emissions associated with electricity generation and natural gas combustion can be reduced. The increasing cost of energy has stimulated technological research and development of alternative energy, generated from sources that are naturally replenished (renewable) such as solar power, wind, cogeneration, and/or geothermal power. Use of solar energy for water and space heating is commercially feasible and its use for power generation is now a reality and is fast becoming a major resource with the many renewable energy projects proposed for the Desert Region of the County.

The Building Energy sector is estimated to account for approximately 20 percent of the 2020 unmitigated external emissions forecast in the County. This is the second largest GHG source of all sectors. With the adoption and implementation of all State and County GHG reduction strategies in this Plan, the total emissions reductions related to Building Energy is projected to decrease by approximately 494,699 metric tons CO₂e, which is a 33.3 percent reduction from 2020 unmitigated projections.

GHG 4.2.1.1 BACKGROUND

The County's General Plan and Development Code contain numerous policies and programs that guide development and also support the County's efforts to reduce GHG emissions reductions. The following General Plan (GP) policies, while not specifically quantifiable in terms of the amount of GHG reduction, effectively contribute to the County's reduction efforts.

1. **Minimize Energy Consumption.** GP Goal CO 8 states: The County will minimize energy consumption and promote safe energy extraction, uses and systems to benefit local regional and global environments.
2. **Energy Conservation.** The County supports planning that conserves energy, reduces natural resource consumption, and minimizes environmental impacts (GP Policy CO 8.1 and 8.2). The County promotes energy-efficient design features, including appropriate site orientation, use of lighter-color roofing and building materials, use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling, and use of automated time clocks or occupant sensors to control central heating and air conditioning (GP Policy CO 8.8 and 8.9). Recognizing that fossil fuel combustion contributes to poor air quality, General Plan Policy CO 8.6 requires alternative energy production and conservation, as follows:
 - (i) New developments in the County are encouraged to incorporate the most energy-efficient technologies that reduce energy waste by weatherization, insulation, efficient appliances, solar energy systems, reduced energy demand, efficient space cooling and heating, water heating, and electricity generation; and,
 - (ii) All new subdivisions for which a tentative map is required are required to provide to the extent feasible, for future natural heating or cooling opportunities in the subdivision. This can be accomplished by design of lot size and configuration for heating or cooling from solar exposure or shade and breezes, respectively.
3. **Land Use and Building Controls.** To take advantage of the unique climatic and geographic opportunities for energy conservation and small-scale alternative energy systems in each of the County's three geographic regions, the County will: implement land use and building controls and incentives to ensure energy-efficient standards in new developments that comply with California energy regulations as minimum requirements; quantify local climate variations and in each climatic region require energy conservation systems in new construction; and fully enforce all current residential and commercial California Energy Commission energy conservation standards (GP Policy CO 8.5).
4. **Energy Efficiency.** The County: evaluates residential developments with an emphasis on energy-efficient design and siting options that are responsive to local climatic conditions and applicable laws; provides an Insulation and Weatherization



Program for eligible households; and, encourages the use of energy conservation features in residential construction, remodeling, and existing homes (GP Policy H 2.5, H 2.9 and H 2.10).

5. **Renewable Energy.** G.P. Policy CO 8.3 states that the County will assist in efforts to develop alternative energy technologies that have minimum adverse effect on the environment, and explore and promote newer opportunities for the use of alternative energy sources. The County's goal is to site renewable energy facilities equitably to minimize net energy use and consumption of natural resources, and avoid inappropriately burdening certain communities (GP Policy CO 4.1 and G.P. Goal CO 8).

GHG 4.2.1.2 BUILDING ENERGY GHG PLAN GOALS, OBJECTIVES AND STRATEGIES

As a compliment to the General Plan goals and policies stated above, the following GHG Plan goals, objectives, and strategies reduce greenhouse gases generated by energy use in buildings and facilitate siting of renewable energy facilities.

GHG Goal EE 1: Reduce GHG emissions from the generation of electricity by reducing electricity use through increased efficiency and project design that incorporates renewable energy.

Objective GHG EE 1.1 Promote Community energy conservation and encourage incorporation of green features in buildings.

Reduction Strategies

1. **Public Education.** The County will engage in public outreach to increase community awareness about energy efficiency, emissions reduction programs, and incentives, including rebates available for their residence or type of business.

(Measure R3E6, Appendix A)
2. **Cross-Jurisdictional Coordination.** The County will coordinate its efforts to increase energy efficiency and use of alternative energy with other local governments, special districts, nonprofits, and other public organizations to share resources, achieve economies of scale, and develop green building policies and programs that are optimized on a regional scale.

(Measure R3E7, Appendix A)
3. **Green Building Development Facilitation and Streamlining.** The County will encourage and facilitate Green Development by continuing to identify and remove regulatory or procedural barriers to implementing green building practices in the County, such as updating codes, guidelines, and zoning.

(Measure R3E1, Appendix A)

Objective GHG EE 1.2 Establish policies and programs to improve energy efficiency and increase renewable energy use in existing buildings

Reduction Strategies

1. **Residential Energy Efficiency Retrofits.** Through County incentives and market forces, a segment of existing residential dwellings will be retrofit with energy efficient features, resulting in a GHG reduction of at least 1.2 percent reduction of the total 2020 unmitigated emissions attributable to the Building Energy sector. This measure will be implemented and facilitated through a combination of County permitting of major renovations and incentives for homeowners to voluntarily retrofit their properties, such as funding mechanisms, and the Green County Program for waiving permit fees. The County will also increase community awareness of the potential for energy efficient retrofits, engage in efforts to ensure a qualified retrofit workforce and remove regulatory barriers, if any, to implementing green building practices.

(Measure R2E1, Appendix A; The R3 measures that facilitate this measure are more fully discussed in sections 4 through 8 below.)

2. **Commercial Energy Efficiency Retrofits.** Through County incentives and market forces, a segment of existing commercial buildings will be retrofit with energy efficient features, resulting in a GHG reduction of at least 0.6 percent of the total 2020 unmitigated emissions attributable to the Building Energy sector. This measure will be implemented and facilitated through a combination of County permitting of major renovations and incentives for building owners to voluntarily retrofit their commercial properties, including funding mechanisms, and the Green County Program for waiving permit fees. The County will also increase community awareness of the potential for energy efficient retrofits, engage in efforts to ensure a qualified retrofit workforce and remove regulatory barriers, if any, to implementing green building practices.

(Measure R2E2, Appendix A; The R3 measures that facilitate this measure are more fully discussed in sections 4 through 8 below)

3. **Residential Retrofit Renewable Energy Incentives.** Through County incentives and market forces, solar photovoltaic panels will be installed in a segment of existing residential dwellings during a retrofit or major renovation, resulting in GHG reduction of at least 1.4 percent of the total 2020 unmitigated emissions attributable to the Building energy sector. This program will be implemented and facilitated through a combination of County permitting for major renovations and incentives for homeowners to voluntarily retrofit their properties, such as renewable energy funding mechanisms, and the Green County Program for waiving permit fees. The County will also increase community awareness of the potential for renewable energy retrofits, engage in efforts to ensure a qualified



retrofit workforce and remove regulatory barriers, if any, to implementing green building practices.

(Measure R2E3, Appendix A; The R3 measures that facilitate this measure are more fully discussed in sections 4 through 8 below)

4. **Permitting Process for Retrofits.** The County will continue to identify and remove regulatory and procedural barriers to implementing green building practices and will ensure that plan review and building inspection staff are trained in green building materials, practices, and techniques.

(Measure R3E1, Appendix A)

5. **Green Building Training.** The County will contribute to developing a trained and qualified retrofit workforce by providing green building information, marketing, training, and technical assistance to property owners, development professionals, schools, and special districts.

(Measure R3E2, Appendix A)

6. **Community Building Energy Efficiency & Conservation for Existing Buildings.** The County will perform community outreach to increase community awareness of the benefits of retrofitting existing buildings with energy efficiency features and alternative energy improvements, as follows:

- a. Providing public education about energy efficiency and alternative energy programs and incentives, using the County's Green County website and other informational tools.
- b. Providing information to home and business owners about the benefits of energy efficient products, features and improvements.
- c. Encouraging performance of energy audits when residential and commercial buildings undergo major renovations.

(Measure R3E3, Appendix A)

7. **Incentives for Retrofits.** The County will continue to implement incentive programs to promote energy efficiency in existing buildings.

- a. Green County Program. Through the Green County Program, adopted in August 2007, building permit fees are waived⁵ for projects that make an existing home or business more energy-efficient, such as through the installation of solar systems, wind-generated electrical systems, tankless water heaters, or highly energy-efficient heating, ventilation, and air-conditioning (HVAC) systems.

(Measure R3E1, Appendix A)

⁵ The waiver of permit fees is limited to a maximum of \$5,000 per project and a maximum total of \$45,000 per fiscal year for the entire program.

- b. Solar Hot Water Incentives. The County will participate in the California Solar Initiative (CSI) Thermal Program established in January 2010 by the California Public Utilities Commission to provide incentives for the installation of solar water heating systems in new and existing homes and business in the territories of Southern California Edison, Southern California Gas Company, and Pacific Gas and Electric Company. In accordance with AB 1470, the statewide incentive program to encourage the installation of 200,000 solar water-heating systems will run through 2017, or until the program funds are exhausted. The County will facilitate participation in this program by providing access to information about the program and waiving permit fees⁶.

(Measure R2E5, Appendix A)

8. **Funding for Retrofits – Energy Efficiency Financing.** The County will pursue grants and financing options for energy efficiency retrofits and renewable energy improvements and increase community awareness of these options.

- a. AB 811-Type Program. The County will pursue implementation of a Property Assessed Clean Energy (PACE) type financing program, providing capital for energy efficient retrofits and renewable energy improvements that are permanently fixed to real property. With the adoption of AB 811 in September 2008, the California Legislature authorized local governments to create programs providing an option whereby property owners can finance renewable energy generation and energy efficiency improvements through low-interest loans that would be repaid as an item on the property owner's tax bill. One advantage of the program for a homeowner is that the payments stay with the property and not with the owner if the property is sold prior to the repayment of the retrofit lien.⁷

(Measure R3E4, R3E12, Appendix A)

- b. Other Financing Options. The County will continue to explore additional financing options for energy efficiency and renewable energy retrofits.

(Measure R3E4, R3E12, Appendix A)

- c. Insulation and Weatherization Program. Through the County's program, administered by the Community Action Partnership, income-eligible homeowners or renters that qualify will have weatherization improvements installed including: attic/ceiling insulation; weather stripping; set back

⁶ The waiver of permit fees is limited to a maximum of \$5,000 per project and a maximum total of \$45,000 per fiscal year for the entire program.

⁷ AB 811 financing districts for residential retrofits are currently constrained by Fannie Mae and Freddie Mac mortgage requirements. It is presumed that this constraint can be lifted in the future and/or other alternative financing mechanisms will be available to implement this GHG Reduction Plan for residential retrofits. There is no current constraint for AB 811 type programs for commercial mortgages; as such the County can commence toward developing such a program upon adoption of this plan.



thermostats; window/glass replacement; duct repair; water heater/range replacement; heating system repairs/replacement; and other improvements. The County will continue to target local funds including Redevelopment and Community Development Block Grants for retrofits for existing low-income housing.

(Measure R3E4, Appendix A)

- d. Energy Efficient Mortgage (EEM). An EEM, sponsored by federally insured mortgage programs and conventional markets, credits a home's energy efficiency through the home's mortgage. Since this is a little known financing option, the County will increase community awareness of the program and provide information relating to EEMs with reference to the federal website at www.energystar.gov. This website states that "EEMs give borrowers the opportunity to finance cost-effective, energy-saving measures as part of a single mortgage and stretch debt-to-income qualifying ratios on loans thereby allowing borrowers to qualify for a larger loan amount and a better, more efficient energy-efficient home."

(Measure R3E4, R3E12, Appendix A)

9. **Accessory Wind Energy Systems.** The County Development Code currently provides a comprehensive set of standards for the placement of accessory wind energy systems on parcels in order to encourage the generation of electricity for onsite use, thereby reducing the consumption of electrical power supplied by utility companies. (Chapter 85.18)

(Measure R3E14, Appendix A)

Objective GHG EE 1.3 Establish policies, standards and incentives to increase energy efficiency and alternative energy use in new building construction.

Reduction Strategies

1. **Mitigation of GHG Emissions Impacts Through Development Review Process.** The County will reduce GHG emissions attributable to new development projects at least 31% by 2020. Measurable reductions of GHG emissions will be achieved through the County's review and discretionary approval of residential, commercial, and industrial development projects. It is expected that project proponents will include energy efficiency and alternative energy strategies to help reduce projects' GHG emissions because these are often the most cost-effective approach to reducing GHG emissions.

(Measures R2E6, R2E7, R2E8, R2E9 and R2E10, Appendix A)

2. **Solar Hot Water Incentives.** The County will participate in the California Solar Initiative (CSI) Thermal Program to provide incentives for the installation of solar water heating systems in new homes and business.

(Measure R2E5, Appendix A)

3. **Solar-Ready Buildings Promotion.** The County will work with the building and real estate industries to encourage new building construction to provide for the easy, cost-effective installation of solar energy systems in the future. Solar-ready features should include: proper solar orientation (south facing roof area sloped at 20° to 55° from the horizontal), clear access on the south sloped roof (no chimneys, heating vents, plumbing vents, etc.), electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water system, and space provided for a solar hot water storage tank.

(Measure R3E11, Appendix A)

4. **Warehouse Renewable Energy Incentives.** The County will promote and encourage participation in an incentive program, for installation of solar photovoltaic panels on new warehouse development projects, to be developed through a partnership between Southern California Edison and California Public Utilities Commission.

(Measure R2E4, Appendix A)

5. **Accessory Wind Energy Systems.** The County's regulations to facilitate use of wind energy systems will encourage the generation of electricity for onsite use of new construction. (Chapter 85.18 of the County Development Code).

(Measure R3E14, Appendix A)

6. **Off-Site Mitigation of GHG Impacts for New Development.** The County will pursue development of a policy and/or guidelines for off-site mitigation of GHG impacts from new development projects in accordance with CEQA, including retrofitting off-site buildings to improve energy efficiency.

(Measure R3E15, Appendix A).

7. **Heat Island Mitigation Plan.** The County will evaluate the feasibility of developing a "heat island" mitigation plan including guidelines for cool roofs, cool pavements, and strategically placed shade trees.

(Measure R3E5, Appendix A).



GHG Goal EE 2 Reduce GHG emissions from the generation of electricity by promoting and supporting the siting of new renewable energy generation facilities.

Objective GHG EE 2.1 Establish and promote policies and strategies that facilitate the siting of new renewable energy generation.

Objective GHG EE 2.2 Establish and promote policies and strategies that facilitate renewable energy generation and co-generation projects where feasible and appropriate.

Objective GHG EE 2.3 Establish and implement measures that support the purchase and use of renewable and alternative energy.

Reduction Strategies

1. **Renewable Energy Generation Facilities.** The County has adopted standards and permit procedures for the establishment, maintenance and decommissioning of renewable energy generation facilities within its authority. These regulations are intended to facilitate development while ensuring that renewable energy generation facilities are designed and located in a manner that minimizes visual, safety and economic impacts on the surrounding community. Prior to this Development Code update, the County required all renewable energy projects to go through a General Plan amendment and Zone Change, if necessary, to put into effect an Energy Facilities overlay, that would allow such facilities to be developed. With the approval and adoption of Chapter 84.29, renewable energy facilities that are located in Resource Conservation (RC), Agricultural (AG), Floodway (FW), Regional Industrial (IR) or Rural Living (RL-20) land use zones are considered compatible uses and no longer require a General Plan Amendment or Zone Change (Chapter 84.29 of the County Development Code).

(Measure R3E10, Appendix A).

2. **Community Alternative Energy Development Plan.** The County will explore the development of an alternative energy plan with Southern California Edison for alternative energy production for the existing built environment which includes identification of appropriate types of alternative energy facilities and potential sites for location in the County.

(Measure R3E8, Appendix A)

3. **Support Utility-Scale Renewable Energy Siting and Transmission Lines.** The County will work with state and federal agencies and the renewable energy industry to identify suitable sites for production of renewable energy using local renewable resources such as solar, wind, small hydro, and biogas.

(Measure R3E9, Appendix A)

4. **Regional Renewable Energy Collaboration.** The County will collaborate with local governments, special districts, nonprofits, and other public organizations to

share resources, achieve economies of scale, and develop renewable energy policies and programs that are optimized on a regional scale.

(Measure R3E13, Appendix A)

5. **Identify and Resolve Potential Barriers to Renewable Energy Deployment.** The County will continue to identify and remove regulatory or procedural barriers to producing renewable energy in building and development codes, design guidelines, and zoning ordinances.

(Measure R3E10, Appendix A)

6. **Mitigation of GHG Emissions Impacts Through Development Review Process.** Measurable reductions of GHG emissions will be achieved through the County's review and discretionary approval of new renewable energy facilities.

(Measures R2E6, R2E7, R2E8, R2E9, and R2E10, Appendix A).

GHG 4.2.1.3 SUMMARY OF STATE ACTIONS TO REDUCE GHG EMISSIONS RELATING TO BUILDING ENERGY

With the adoption of Senate Bills (SBs) 1075 (2002) and 107 (2006), the State created the Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires State agencies to take all appropriate actions to ensure the target is met. The 33 percent RPS by 2020 goal is supported by the California Air Resources Board (CARB). Additionally, Assembly Bill (AB1109) mandates that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other State efforts, are structured to reduce State-wide electricity consumption in the following ways: (1) At least 50 percent reduction from 2007 levels for indoor residential lighting by 2018; (2) At least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

The State will also be pursuing energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 GHG reduction target, and will result in additional emissions reductions beyond those already accounted for in the current California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations). CARB also intends to promote increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will to offset 30,000 GWh of electricity use State-wide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible CHP portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. These measures are more specifically described in Appendix A.



GHG 4.2.2.4 SUMMARY OF REDUCTION MEASURES RELATING TO BUILDING ENERGY USE

Total estimated GHG percent reductions and quantities from the energy efficiency and renewable energy reduction measures (both R1 and R2) are presented below in **Table 4-3**. Emission reductions for each measure are applied to the 2020 unmitigated projected emissions for the appropriate emission quantity affected by that measure. Reductions attributed to these measures from the unmitigated 2020 building energy use emissions will be 33.3 percent.

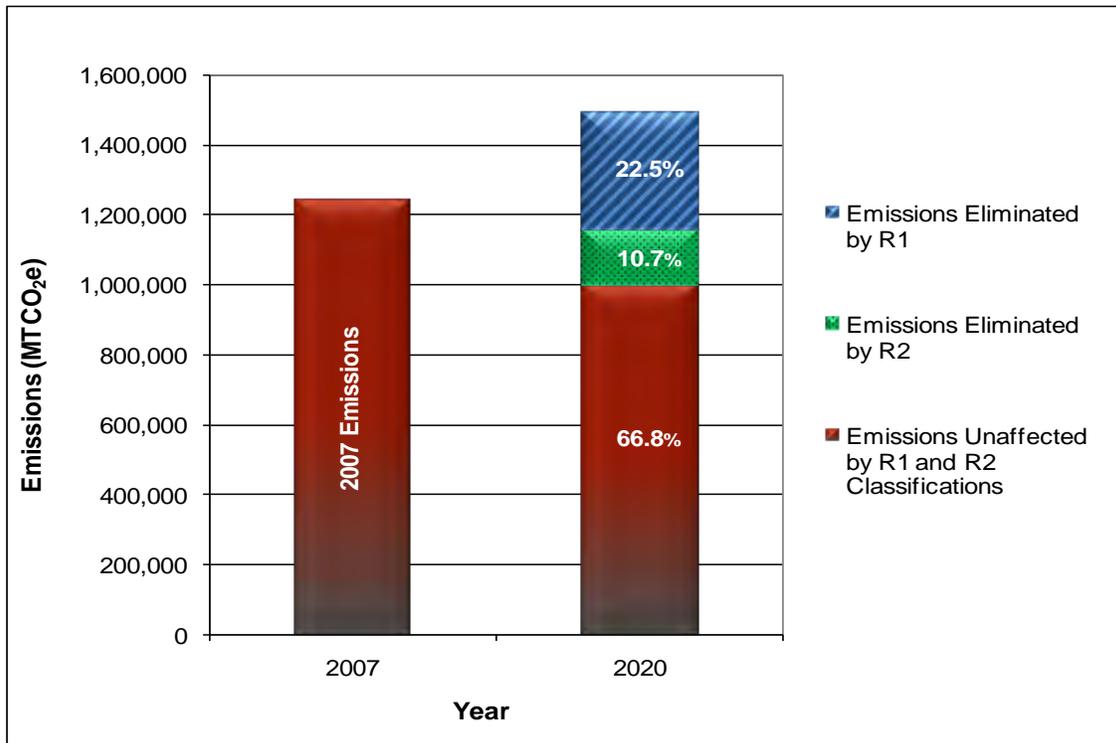
Table 4-3: External GHG Emission Reductions from Implementation of Building Energy (Energy Efficiency & Renewable Energy) Strategies

Reduction Classification and Reduction Measure	GHG reductions	
	Emission Reduction from 2020 unmitigated levels	Percent Reduction from 2020 unmitigated levels
R1: Existing and proposed state and regional building energy measures that do not require County action		
R1E1: RPS – 33 percent by 2020	104,236	7.0
R1E2: AB 1109 Residential Lighting	23,473	1.6
R1E3: AB 1109 Commercial/Outdoor Lighting	14,814	1.0
R1E4: Electricity Energy Efficiency (AB 32)	106,925	7.2
R1E5: Natural Gas Energy Efficiency (AB 32)	9,429	0.6
R1E6: Increased Combined Heat and Power (AB 32)	63,881	4.3
R1E7: Industrial Efficiency Measures (AB 32)	12,488	0.8
R2: Existing and new building energy measures that require County action		
R2E1: Residential Energy Efficiency Retrofits	17,350	1.2
R2E2: Commercial Energy Efficiency Retrofits	8,540	0.6
R2E3: Residential Renewable Energy Incentives	21,351	1.4
R2E4: Warehouse Renewable Incentive Program	6,786	0.5
R2E5: Solar Hot Water Incentives	11,907	0.8
R2E6: New Residential Energy Efficiency (through DRP)	9,460	0.6
R2E7: New Commercial Energy Efficiency (through DRP)	35,342	2.4
R2E8: New Home Renewable Energy (through DRP)	2,239	0.2
R2E9: New Commercial/Industrial Renewable Energy (through DRP)	25,392	1.7
R2E10: Commercial/Industrial Rehabilitation/Expansion Renewable Energy (through DRP)	21,086	1.4
Total	494,699	33.3
R3: Existing and new building energy measures—reductions not quantified or relied upon to achieve reduction goal		
R3E1: Green Building Development Facilitation and Streamlining		
R3E2: Green Building Training		
R3E3: Community Building Energy Efficiency & Conservation for Existing Buildings		
R3E4: Energy Efficiency Financing		
R3E5: Heat Island Mitigation Plan		
R3E6: Public Education		

Reduction Classification and Reduction Measure	GHG reductions	
	Emission Reduction from 2020 unmitigated levels	Percent Reduction from 2020 unmitigated levels
R3E7: Cross-Jurisdictional Coordination		
R3E8: Community Alternative Energy Development Plan		
R3E9: Support Utility-Scale Renewable Energy Siting and Transmission Lines		
R3E10: Identify and Resolve Potential Barriers to Renewable Energy Deployment		
R3E11: Solar Ready Buildings Promotion		
R3E12: Renewable Energy Financing		
R3E13: Regional Renewable Energy Collaboration		
R3E14: Accessory Wind Energy Systems		
R3E15: Off-Site Mitigation of GHG Impacts for New Development		

With implementation of the Building Energy reduction strategies included in this Plan, by 2020 GHG emissions will be approximately 20 percent lower than 2007 emissions. **Figure 4-3** below, graphically depicts this reduction.

Figure 4-3: External GHG Emission Reductions from Building Energy Measures



GHG 4.2.2 TRANSPORTATION AND LAND USE SECTOR



The County of San Bernardino encompasses 20,164 square miles of land area of which approximately 15 percent falls under the jurisdictional control of the County Board of Supervisors. Approximately eighty percent (81%) of the County's total land area is in public ownership while the incorporated cities collectively have jurisdictional control over the remaining four percent.



The County is located on the eastern edge of the Los Angeles metropolitan region. In this location, the County acts as the gateway between southern California and the continental United States. It is also the largest County within the continental United States by area, containing three very distinct regions—Valley, Mountain and Desert. The vast majority of travel trips in the County are made by automobile, using the existing network of freeways and arterial highways. Transit (bus and commuter rail) service is also an increasingly important mode of transportation, in the more urbanized parts of the



County. A small fraction of the trips are made utilizing other modes of transportation such as air, intercity rail, bicycling, and walking.

There are three fundamental approaches to reducing transportation emissions: 1) increasing vehicle fuel efficiency, 2) lowering the Carbon content of fuels and 3) reducing vehicle-miles traveled (VMT). For the most part, the state and federal governments are addressing vehicle fuel efficiency and carbon content of fuels through vehicle emissions standards, mileage standards, low carbon fuel standards, and the promotion of alternative fuels. The County's objective to reduce VMT can be accomplished through two primary approaches: by providing alternatives to single-occupancy vehicle travel that includes transit, ridesharing, carpools, bicycling, walking and telecommuting; and through effective land use planning techniques that reduce the need for lengthy vehicle trips.

GHG 4.2.2.1 BACKGROUND

The County General Plan and Development Code contain numerous policies and programs that guide development and also support the County's efforts to reduce GHG emissions. The following General Plan (GP) Policies, while not specifically quantifiable in terms of the amount of GHG reduction, effectively contribute to the County's reduction efforts.

1. **Vehicle Miles Traveled (VMT).** To reduce VMT and provide alternatives to single-occupancy vehicle travel, the County has numerous policies and programs outlined in the General Plan's circulation, economic development, housing, land use, conservation and open space elements. The General Plan calls for an increase in the densities of certain parcels, mixed land uses, and a refocus on existing neighborhoods in order to reduce dependence on the private automobile and to reduce VMT through supporting multiple centers. Through the land use zoning districts, the County encourages residences to be located near neighborhood commercial centers in new developments to encourage walking to nearby shopping. The County also strives to maximize the use of telecommunications to reduce transportation and land use demands (GP Policy CI 15.1).

Through implementation of its General Plan, the County strives to provide transportation and circulation systems that adequately provide for intra-city and regional transportation needs. Alternatives to the drive-alone mode, such as mass transit, ride sharing, bicycling, trail systems and telecommuting are encouraged to reduce VMT, traffic congestion and enhance air quality. The County is committed to coordinating with Caltrans, SANBAG, the Southern California Association of Governments (SCAG) and other agencies regarding transportation system improvements in the County's Measure I (transportation tax mechanism) and other adopted Capital Improvement Programs. Where appropriate, the County also seeks to jointly fund studies and transportation system improvements through coordination with other cities, adjacent counties and developers. (GP Policy CI 1.1, CI 2.2, CI 2.3, CI 2.6, CI 2.7).

2. **Parking Requirements.** In order to discourage the use of single occupant vehicles, the County will continuously reevaluate the parking requirements in the Development Code to ensure that excessive parking is not required, to address options for shared parking, covered parking, and other parking alternatives (GP Policy M/CI 2.2).
3. **Alternative Fuel Vehicles.** In order to minimize energy consumption attributable to transportation (GP Policy CO 8.4), the County is committed to providing incentives such as preferential parking for alternative-fuel vehicles (such as compressed natural gas or hydrogen) (GP Policy CO 4.6) and to establish programs for priority or free parking on County streets or in County parking lots for alternative fuel vehicles (GP Policy CO 4.11). County will also support the development of alternative fuel infrastructure that is publicly accessible (GP Policy CO 4.10).



4. **Job/Housing Balance.** The County strives to achieve and maintain a jobs/housing balance by ensuring that housing and employment opportunities (current and projected) are located close to each other, acknowledging housing and employment opportunities within both unincorporated County areas and cities (GP Policy LU 5.1) and by facilitating business growth, and encouraging the economic revitalization of business centers in the communities within the County. Specifically, the County encourages a variety of industries to locate in the County, including commercial/professional office uses and “clean,” high-technology industries that provide high-skill/high-wage job opportunities (GP Policy ED 10.1).
5. **Land Use Planning.** The County is also committed to reducing the dependence on automobiles for local trips by integrating transportation and land use planning at the community and regional levels, by encouraging mixed-use development through the planned development process that includes dense, multiple-family residential development and clustered, single-family residential development, and other uses that provide convenient shopping and employment opportunities close to major transportation corridors (GP Policy H11.6, CI 4.2, LU 6.1) and by promoting such facilities as the Mag-Lev/high-speed rail system that would link the County with other parts of the region (GP Policy ED 15.1). The County, however, discourages leap-frog development and urban sprawl by restricting the extension or creation of new urban services or special districts to areas that cannot be sustained in a fiscally responsible manner. (GP Policy LU 9.2).
6. **Park-and-Ride Facilities.** County supports the development of park-and-ride transit service in County communities (GP Policy M/CI 1.10) and based on population and residential densities, promotes the development of shuttle services from residential neighborhoods to recreational areas and major commercial centers (GP Policy M/CI 1.11). There are 11 Park & Ride facilities located across the southwestern portion of the County. Currently, there are five facilities located in the Valley Region, four in the Desert Region and two in the Mountain Region. Each Park & Ride lot is free of charge and open for public use 24 hours a day, seven days a week.
7. **Non-motorized Transportation Plan.** The San Bernardino County Non-Motorized Transportation Plan recommends the completion of a comprehensive Countywide Bikeway Network, a refinement in the way bicycle projects in the County are funded, to help cities identify, prioritize, and fund portions of the Countywide bicycle network, and implementation of new programs to be implemented over the 5-10 year life of the Plan.

Specifically, the County requires safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial, and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips (GP Policy CI 6.1). The County also encourages the installation of bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available. The County regularly coordinates with local and regional transportation agencies

and cities to plan and construct new multi-modal transportation facilities (GP Policy CI 4.5).

Trails are an important part of the non-motorized transportation system that currently exists within the County. These facilities provide public access to open space lands and fulfill an increasingly important role as recreational amenities and provide major backbone linkages to which community trails might connect. To this end, the County is committed to providing a regional trail system and rest areas to furnish continuous interconnecting trails that serve major populated areas of the County and existing and proposed recreation facilities (GP Policy OS 2.1). In the Mountain and Valley regions the County encourages the creation of hiking and biking trails as tourist attractions (GP Policy M/ED 1.6) and, where feasible, to connect new and existing residential areas with major activity and commercial centers (GP Policies V/OS, M/OS 2.3, M/OS 2.4, M/OS 2.6 and M/OS 2.7). The addition of bicycle routes is also encouraged whenever existing highways are widened or significant lengths of highways are improved (GP Policy M/OS 2.5). The County Department of Regional Parks is responsible for maintaining all County-designated regional trails, all of which are multi-use trails that allow pedestrian, bicycle and equestrian use.

8. **Rideshare Programs.** County encourages the reduction of automobile usage throughout the County through various incentive programs (GP Policy CI 3.1) and by supporting the efforts of other agencies working in the County. The County, for example, encourages special event center operators to provide discounted transit passes with event tickets or offer discounted on-site parking for carpooling patrons (for two or more persons per vehicle) (GP Policy CO 4.7).

GHG 4.2.2.2 TRANSPORTATION AND LAND USE GHG PLAN GOALS, OBJECTIVES AND STRATEGIES

As a compliment to the General Plan goals and policies stated above, the following GHG Plan goals, objectives, and strategies r reduce greenhouse gases generated by vehicle miles traveled.

GHG Goal TL 1: Promote land use strategies that decrease reliance on automobile use, increase the use of alternative modes of transportation, maximize efficiency of urban services provision and reduce emissions of greenhouse gases.
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Objective GHG TL-1.1: Encourage development that promotes non-automobile transportation.



Reduction Strategies:

1. **Regional Land Use/Transportation Coordination (SB 375).** In accordance with SB 375, as Regional Planning Agencies set regional targets for GHG emissions and create a plan to meet those targets, coordinate with local jurisdictions, the San Bernardino Associated Governments (SANBAG), the Southern California Association of Governments (SCAG) and the regional transit providers to promote mixed-use development, transit linkages and transit-oriented development in unincorporated portions of the County. With the regional planning activities taking place over the next three to four years, the reduction value of this measure will be quantified as the planning is developed and completed.

(Measure R3T4, Appendix A)

2. **Mitigation of GHG Emissions Impacts Through Development Review Process.** Measurable reductions of GHG emissions will be achieved through the County's review and discretionary approval of new development projects. It is anticipated that significant transportation/land use GHG reduction measures will be among the mitigation, such as, pedestrian and bike paths, transit oriented development, mixed use, etc.

(Measure R2T2, R2T6, and R2T7, Appendix A)

3. **Bicycle/Pedestrian Infrastructure and Promotion.** To promote bicycle and pedestrian infrastructure, the County will: 1) require new development, through the development review process, to address and incorporate bicycle/pedestrian facilities where appropriate and require new development to provide bicycle lanes and walking paths near schools with adequate bicycle parking; 2) encourage the development of bicycle stations at intermodal hubs in collaboration with regional transportation providers; 3) establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel, and will require bike racks along these trails at secure, lighted locations; and 4) apply for regional, State, and federal grants for bicycle and pedestrian infrastructure projects, and will consider using development exactions/impact fees, such as the County's Santa Ana River Trail development fee, to provide bicycle and pedestrian facilities.

(Measure R2T7, Appendix A)

4. **Parking Policy.** The County will develop and implement a comprehensive parking policy for public and private lots throughout the County that:
 - a. Encourages carpooling, shared parking and the use of alternative transportation, including providing parking spaces for carpool vehicles and alternative fuel vehicles at convenient locations accessible by public transportation;
 - b. Reduces parking requirements and/or provide for shared parking for special uses such as mixed-use projects, residential developments for senior citizens or projects that are within 0.25 mile of a public transit stops;

- c. Promotes the designation of preferred commercial parking spaces for high-occupancy, car-share, and alternative fuel vehicles;
- d. Encourages larger parking spaces to accommodate vans used for ride-sharing; and
- e. Promotes the use of shade trees, and convenient pedestrian pathways through parking areas.

(Measure R2T3, Appendix A)

5. **Pedestrian-oriented Character.** The County will foster distinct, identifiable neighborhoods whose characteristics support pedestrian travel, especially within, but not limited to, mixed-use and transit-oriented development projects through the use of planned developments and specific plans.

(Measure R3T10, Appendix A)

6. **Site-Specific Development Standards.** Continue to allow site-specific development standards to be implemented for Planned Development projects.

(Measure R3T10, Appendix A)

Objective GHG TL 1.2: Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones.

Reduction Strategies

1. **Revise Zoning Ordinance.** The County will consider revising the County Development Code where appropriate to allow local-serving businesses, such as childcare centers, restaurants, banks, family medical offices, drug stores, and other similar services near employment centers to minimize midday vehicle use.

(Measure R3T10, Appendix A)

2. **Complementary Land Uses.** The County will continue to identify and facilitate the inclusion of complementary land uses not already present in the zoning land use districts, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business zoning districts, to reduce the vehicle miles traveled and promote bicycling and walking to these uses.

(Measure R3T10, Appendix A)

3. **Mixed Use Projects.** The County will encourage mixed-use development especially within areas of city's spheres of influence or where the project is located within one-half mile of intermodal hubs and future rail stations.



(Measure R3T10, Appendix A)

4. **Density Bonuses.** The County will continue to provide density bonuses for selected development.

(Measure R3T10, Appendix A)

5. **Preparation of Specific Plans.** The County will seek funding to prepare specific plans and related environmental documents to facilitate mixed-use development at selected sites, and allow these areas to serve as receiver sites for transfer of development rights away from environmentally sensitive lands and rural areas outside of developed areas.

(Measure R3T10, Appendix A)

6. **Mixed-Use Structures.** The County will enable the development of mixed-use structures in neighborhood centers that can be adapted to new uses over time with minimal internal remodeling.

(Measure R3T10, Appendix A)

7. **Complementary Land Uses.** The County will continue to encourage the inclusion of complementary land uses in local zoning districts that allows a mix of uses, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business districts to reduce the vehicle miles traveled and promote bicycling and walking to these uses.

(Measure R3T10, Appendix A)

8. **Infill.** The County will encourage infill development and the creative reuse of brownfield, under-utilized and/or defunct properties within areas of County's spheres of influence.

(Measure R3T10, Appendix A)

9. **Increase Densities in Sphere Areas.** The County will consider higher-density development within areas of city's spheres of influence or where the project is located within one-half mile of intermodal hubs and future rail stations.

(Measure R3T10, Appendix A)



GHG Goal TL 2: Reduce GHG emissions by reducing vehicle miles traveled, by encouraging the use of alternative fuels, alternative modes of transportation and providing roadway improvements that improve mobility and reduce congestion.

Objective GHG TL 2.1: Reduce VMT related-emissions by implementing and supporting trip reduction programs.

Reduction Strategies

1. **Regional Employment Based Trip Reduction Programs.** The County will continue to support and promote trip reduction programs developed by SANBAG. SANBAG is responsible for efforts throughout San Bernardino County to encourage commuters to carpool, vanpool, use public transit, cycle, or walk to work. This is primarily accomplished by working directly with large and small employers, as well as providing support to commuters who wish to share rides or use alternative forms of transportation. SANBAG operates two programs for individuals and one for employers through which commuters can receive financial incentives by participating in a rideshare program. Option Rideshare is a program that offers commuters financial incentives of up to \$2.00 per day when they use a rideshare mode for three consecutive months. Team Ride is an extension of the initial program that provides discounts and special offers to participants at restaurants and events in both San Bernardino and Riverside Counties. The final program is the Inland Empire Commuter Services Program. This program is designed to help employers develop and maintain a rideshare program through free education and assistance from SANBAG.

(Measure R3T5, Appendix A)

2. **Employment-Based Trip Reduction Plan.** SCAQMD Rule 2202 applies to any employer who employs 250 or more employees. Employers who qualify must annually register with the SCAQMD to implement an emission reduction program to meet a worksite-specific emission reduction target through measures such as work-related trip reduction plans, emission reduction credits, or Air Quality Investment Program fees. The purpose of this Rule is to provide employers with a menu of options to reduce mobile source emissions generated from employee commutes, to comply with federal and state Clean Air Act requirements, Health & Safety Code Section 40458, and Section 182(d)(1)(B) of the federal Clean Air Act.

Expanding on SCAQMD Rule 2202 (Employee Commute Reduction Program), the County will evaluate the feasibility of implementing a trip reduction ordinance requiring employers with 100 employees or more to prepare a voluntary trip reduction plan (TRP). Trip reduction techniques might include commuter-choice programs, employer transportation management, guaranteed ride-home programs, and commuter assistance and outreach. If adopted, the ordinance would apply to all discretionary land use approvals made on or after the ordinance is effective.



(Measure R2T2, Appendix A)

3. **Increase the Use of Ridesharing.** The County will promote and encourage ridesharing as follows:
 - a. Exploring financing programs for the purchase or lease of vehicles used in employer ride sharing programs;
 - b. Encouraging community car-sharing through employers, such as expanding the existing Commute-Smart measure;
 - c. Encouraging community creation of rideshare incentives such as gas cards, carpool awards, educational seminars, commuter-choice programs, commuter-tax benefits, guaranteed ride-home programs, commuter assistance and outreach.

(Measure R2T6, Appendix A)

4. **County Commuter Services Program.** The County currently operates and will continue to operate an active and effective Commuter Services Program to encourage, coordinate, and reward alternate commuting. The County's Commuter Services Program provides employees with tools to find a carpool partner or vanpool, tips on bicycle commuting, and information on transit.

(Measure R3T6, Appendix A)

5. **Home Employment.** The County will facilitate employment opportunities that minimize the need for private vehicle trips, including:
 - a. Encouraging live/work sites, satellite work centers in appropriate locations, and home occupation for low-impact commercial and office uses in residential zones, regulated by the County's Development Code Home Occupation Permit provisions.
 - b. Encouraging telecommuting with new and existing employers, through project review and incentives, as appropriate.

(Measure R3T7, Appendix A)

Objective GHG TL 2.2: Reduce VMT-related emissions by encouraging the use of alternative modes of transportation.

Reduction Strategies

1. **Public Transit Strategies.** To promote public transit use, the County will: 1) ensure that new development is designed to make public transit a viable choice for residents and/or the local work force; 2) require that new development incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation; and 3) collaborate with regional transit



providers to offer public transit incentives, and improve service, safety, customer satisfaction and user-friendliness of mass transit.

(Measure R3T1, Appendix A)

2. **Leverage Existing Financing Mechanisms and Opportunities.** The County will promote and pursue financing mechanisms and opportunities including the Federal Energy Efficiency Community Block Grant (EECBG), Measure I Funds through SANBAG, Regional Improvement Program (RIP) funds available under the State Transportation Improvement Program (STIP), the Interregional Improvement Program (IIP), the Regional Transportation Improvement Program through SANBAG and SGAG, the Passenger Rail Short Transportation Plan, the San Bernardino County Public Transit – Human Services Transportation Coordination Plan, and the Transportation Development Act. (A more detailed description of these funding mechanisms is presented in the Implementation section of this plan.)

(Measure R3T2, Appendix A)

Objective GHG TL 2.3: Implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions.

Reduction Strategies

1. **Roadway Improvements.** The County will modify arterial roadways, when needed, to allow more-efficient bus operation, including possible signal preemption, expanding signal-timing programs where air quality benefits can be demonstrated, synchronizing traffic signals throughout the County and with adjoining cities while allowing free flow of mass transit systems, and continuous maintenance of the synchronization system.

(Measure R2T4, Appendix A)

2. **San Bernardino Valley Coordinated Traffic Signal System Plan.** The County participated in developing the San Bernardino Associated Governments (SANBAG) strategic plan for interconnecting and coordinating traffic signals in the San Bernardino Valley area across jurisdictional boundaries. In addition to the County, study participants include the cities of Chino, Chino Hills, Colton, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, and Yucaipa; the California Department of Transportation (Caltrans) District 8; and SANBAG.

(Measure R2T4, Appendix A)

3. **Intelligent Transportation Systems Applications.** The County will continue to utilize Intelligent Transportation Systems, which constitute a wide spectrum of techniques and applications that are currently being applied to existing roadways,



highways and transit systems to increase their efficiency, safety and ability to relieve congestion. The County is currently employing several types of Intelligent Transportation Systems applications including:

- a. 1-800-COMMUTE telephone line, which provides travel information for highways, transit, rideshare and other commuting alternatives;
- b. Closed-circuit television cameras to help in identifying and responding to accidents more quickly;
- c. Electronic sensors placed in freeways that transmit vehicle counts to a traffic management center and can be used for monitoring and transmitting real-time traffic conditions;
- d. Traffic signal control systems that are synchronized through computer software specifically designed to better monitor and respond to local traffic congestion;
- e. Changeable message signs that alert drivers to possible delays due to accident or congestion and allow for route diversion; and
- f. Smart call boxes that gather traffic count data and transmit this information to traffic management centers and the CHP.

(Measure R3T8, Appendix A)

4. **High Occupancy Vehicle (HOV) Lanes.** The County supports regional construction of HOV lanes on arterial roadways to encourage carpooling and alternative forms of transportation for commuting. Currently, San Bernardino County has approximately 43 miles of carpool lanes along four separate freeways (i.e., I-10, SR-60, SR-210 and SR-71).

(Measure R2T8, Appendix A)

Objective GHG TL 2.4: Support and promote the use of low- and zero- emission vehicles, and alternative fuels and other measures to directly reduce emissions from motor vehicles.

Reduction Strategies

1. **Expand Use of Renewable Fuels.** The County will collaborate with local and regional governments, businesses and energy purveyors to support expanded use of renewable fuels. Said efforts may include, but are not limited to, the following:
 - a. Preferential parking for alternative fuel vehicles.
 - b. Collaboration with energy purveyors to provide the necessary facilities and infrastructure to encourage the use of privately owned low or zero-emission vehicles such as electric charging facilities and conveniently located alternative fueling stations.
 - c. Encourage taxi operators to use smaller, more fuel-efficient taxicabs and offer incentives to taxicab owners to use gas-electric hybrid vehicles.

(Measure R2T5, Appendix A)

GHG Goal TL 3: Reduce GHG emissions through public education relative to transportation systems.

Objective GHG TL 3.1: Continue to develop and implement educational programs relative to the various modes of transportation.

Reduction Strategies

1. **Bicycle Safety Programs.** The County will continue to implement bicycle safety educational programs to teach drivers and riders the laws, riding protocols, routes, safety tips and emergency maneuvers.

(Measure R3T9, Appendix A)

2. **Motorcycle Safety Programs.** The County will consider developing and implementing a motorcycle safety educational program to teach drivers and riders the laws, riding protocols, routes, safety tips and emergency maneuvers.

(Measure R3T9, Appendix A)

3. **Public Transit and Ride Share Opportunities.** The County will provide educational information about the benefits of and opportunities for public transit and rideshare.

(Measure R3T9, Appendix A)

GHG Goal TL 4: Reduce GHG emissions by regulating the idling of diesel-fueled vehicles and equipment and encouraging the use of alternative fuels and transportation technologies.

Objective GHG TL 4.1: Reduce the exhaust emissions of diesel-fueled vehicles and equipment.

Reduction Strategies

1. **Anti-Idling Enforcement Policy.** The County requires that diesel-fueled vehicles and off-road equipment shall not be left idling on site for periods in excess of five minutes.

(Measure R2T1, Appendix A)

2. **Diesel Exhaust Emissions Control Measures.** The County will continue to implement the County's diesel exhaust emissions control measures, which extend beyond the County's idling restriction described above in the anti-idling



enforcement policy. The County's diesel exhaust control measures described in Development Code Section 83.01.040, apply to all discretionary land use projects approved by the County on or after January 15, 2009. These measures include, but are not limited to:

Off-Road Diesel Vehicle/Equipment Operations. All business establishments and contractors that use off-road diesel vehicle/equipment as part of their normal business operations shall adhere to the following measures during their operations in order to reduce diesel particulate matter emissions from diesel-fueled engines:

- Use reformulated ultra low-sulfur diesel fuel in equipment and use equipment certified by the U. S. Environmental Protection Agency (EPA) or that pre-dates EPA regulations.
- Maintain engines in good working order to reduce emissions.
- Signs shall be posted requiring vehicle drivers to turn off engines when parked.
- Any requirements or standards subsequently adopted by the South Coast Air Quality Management District, the Mojave Desert Air Quality Management District or the California Air Resources Board.
- Provide temporary traffic control during all phases of construction.
- Onsite electrical power connections shall be provided for electric construction tools to eliminate the need for diesel-powered electric generators, where feasible.
- Maintain construction equipment engines in good working order to reduce emissions. The developer shall have each contractor certify that all construction equipment is properly serviced and maintained in good operating condition.
- Contractors shall use ultra low sulfur diesel fuel for stationary construction equipment as required by Air Quality Management District (AQMD) Rules 431.1 and 431.2 to reduce the release of undesirable emissions.
- Substitute electric and gasoline-powered equipment for diesel-powered equipment, where feasible.

Project Design. Distribution centers, warehouses, truck stops and other facilities with loading docks where diesel trucks may reside overnight or for periods in excess of three hours shall be designed to enable any vehicle using these facilities to utilize on-site electrical connections to power the heating and air conditioning of the cabs of such trucks, and any refrigeration unit(s) of any trailer being pulled by the trucks, instead of operating the diesel engines and diesel refrigeration units of such trucks and trailers for these purposes. This requirement shall also apply to Recreational Vehicle Parks (as defined in Section 810.01.200(k) of this title) and other development projects where diesel engines may reasonably be expected to operate on other than an occasional basis.

(Measure R3T3, Appendix A)

GHG 4.2.2.3 SUMMARY OF STATE ACTIONS TO REDUCE GHG EMISSIONS RELATING TO TRANSPORTATION AND LAND USE

The State Legislature took action relative to the Transportation and Land Use sector through the adoption of AB 1493 (Pavley I and II) in 2002, SB 1007 in 2005 and AB 32 in 2006. In addition, the governor issued Executive Order S-1-07 in 2007 and the South Coast Air Quality Management District (SCAQMD) adopted special rules in 2007 that would require CARB to adopt regulations to reduce GHG emissions from automobiles and light-duty trucks, develop and adopt a state plan to increase the use of alternative fuels, adopt a statewide greenhouse gas emissions limit, and require public transit fleets to acquire alternative-fuel heavy-duty vehicles. These and other measures are more specifically described in Appendix A.

GHG 4.2.2.4 SUMMARY OF REDUCTIONS RELATING TO TRANSPORTATION AND LAND USE

With the adoption and implementation of the State and County GHG reduction strategies the total emissions reductions related to the Transportation and Land Use sector is projected to decrease by approximately 528,428 MTCO₂e, which is a 21.9% reduction from 2020 unmitigated projection of on-road transportation emissions.

Total estimated GHG percent reductions and quantities from the reduction measures included in Reduction Scenarios R1 and R2 are presented below in **Table 4-4**. Emission reductions for each measure are applied to the projected 2020 emissions for the appropriate vehicle type.

Table 4-4: External GHG Emission Reductions from Implementation of Land Use and Transportation Strategies

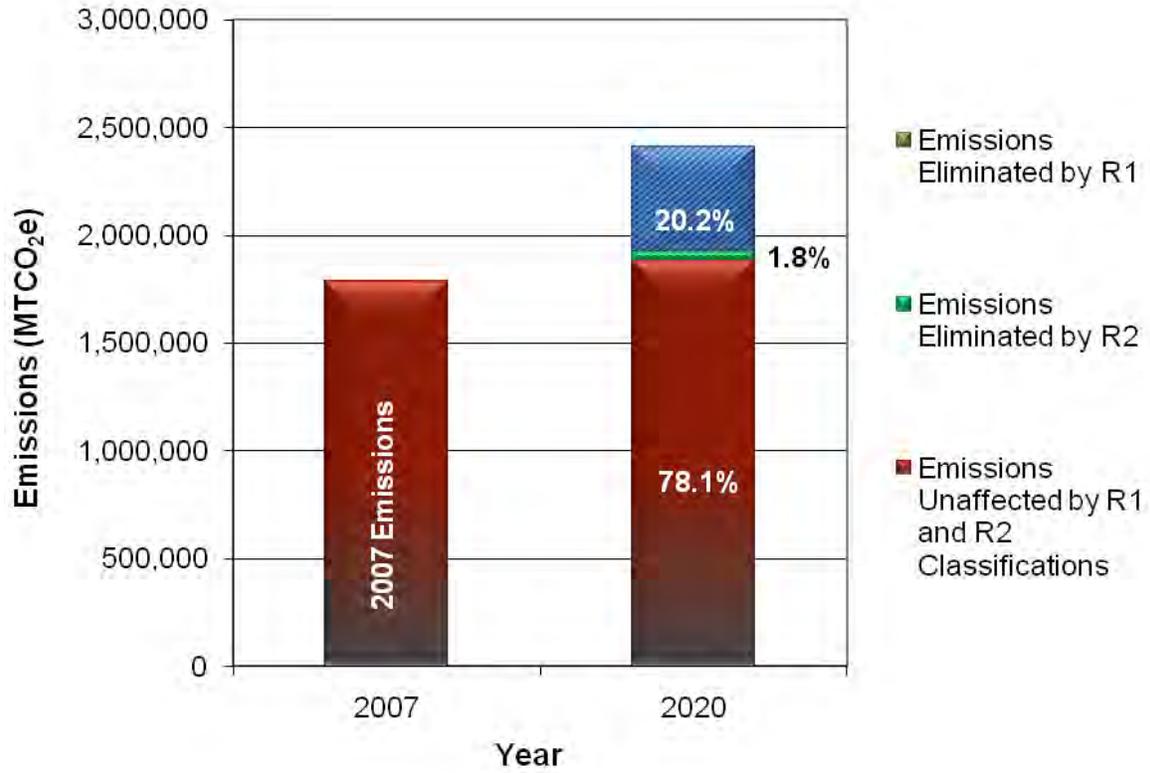
Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Transportation Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
R1: Existing and proposed state and regional transportation measures that do not require County action		
R1T1: California Light-Duty Vehicle GHG Standards: Implement Pavley I Standards	202,569	8.4
R1T2: California Light-Duty Vehicle GHG Standards: Implement Pavley II	29,252	1.2
R1T3: Low Carbon Fuel Standard	161,819	6.7
R1T4: Tire Pressure Program	4,022	0.2
R1T5: Low Rolling Resistance Tires	2,194	0.1
R1T6: Low Friction Engine Oils	20,476	0.8
R1T7: Cool Paints and Reflective Glazing	6,509	0.3
R1T8: Goods Movement Efficiency Measures	37,441	1.6
R1T9: Heavy-Duty Vehicle GHG Emission Reduction	12,514	0.5



Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Transportation Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
(Aerodynamic Efficiency)		
R1T10: Medium-and Heavy-Duty Vehicle Hybridization	7,695	0.3
R1T11: Rule 1192—Clean On-Road Transit Buses	835	0.03
R1T12: Rule 1195—Clean On-Road School Buses	831	0.03
R2: Existing and new transportation measures that require County action		
R2T1: Anti-Idling Enforcement Policy	12,076	0.5
R2T2: Employment Based Trip and VMT Reductions Policy	1,651	0.1
R2T3: Revise Parking Policies	824	0.03
R2T4: Roadway Improvements including Signal Synchronization and Traffic Flow Management	8,230	0.3
R2T5: Expand Renewable Fuel/Low-Emission Vehicle Use	16,295	0.7
R2T6: Ridesharing and Carpooling	798	0.03
R2T7: Bicycle/Pedestrian Infrastructure and Promotion	798	0.03
R2T8: Construct High Occupancy Vehicle (HOV) Lanes	1,594	0.1
Total	528,422	21.9
R3: Existing and new transportation measures— reductions not quantified or relied upon to achieve reduction goal		
R3T1: Public Transit Measures		
R3T2: Financing Mechanisms and Opportunities		
R3T3: Diesel Exhaust Emissions Control Measures		
R3T4: Regional Land Use/Transportation Coordination		
R3T5: Regional Employment Based Trip Reduction Programs.		
R3T6: County Commuter Services Program		
R3T7: Home Employment.		
R3T8: Intelligent Transportation Systems Applications.		
R3T9: Public Outreach and Educational Programs Relative to Various Modes of Transportation.		
R3T10: Land Use Strategies to Reduce Reliance on Automobile Use		

With the implementation of the emission reduction strategies included in this Plan, reduced emissions in 2020 will be approximately five percent higher than 2007 emissions. **Figure 4-4** below graphically depicts the 2020 level of decreased emissions as compared to 2007.

Figure 4-4: External GHG Emission Reductions from Transportation and Land Use Measures



GHG 4.2.3 SOLID WASTE MANAGEMENT SECTOR



The County Solid Waste Management Division (SWMD) is responsible for the operation and management of the County of San Bernardino's solid waste disposal system, which consists of six regional landfills, eight transfer stations, and five community collection centers. The County is responsible for the management of waste generated by both the unincorporated County and the incorporated Cities within the County that is deposited in County-owned landfills. The

County operates six active landfills and 14 closed landfill sites. The County's active landfills range in capacity from just over 3,000 cubic yards at Barstow and Landers to over 80,000 cubic yards at Victorville. In total, the County was responsible for the management of 1,920,829 tons of solid waste in 2007 generated in the unincorporated areas of the County and the incorporated cities in the County. Several of the landfills already have control systems in place for methane capture.

GHG 4.2.3.1 BACKGROUND

The County General Plan and Development Code contain numerous policies and programs that support the County's efforts to reduce GHG emissions. The following General Plan (GP) Policies, while not specifically quantifiable in terms of the amount of GHG reduction, effectively contribute to the County's reduction efforts.

1. **Solid Waste Management Programs.** The County is committed to ensure a safe, efficient, economical and integrated solid waste management system that considers all waste generated within the County; and ensures that a variety of feasible processes are utilized, including source reduction, transfer, recycling, landfilling, composting and resource recovery to achieve an integrated and balanced approach to solid waste management (GP Policies CO 8.7, CI 14.1). In addition, the County is ready to assist the private sector where ever possible in developing methods for the reuse of inert materials that currently use valuable landfill space, and will ensure the careful planning and siting of solid waste disposal facilities to allow for equitable distribution of these facilities throughout the County. The County will also explore the feasibility and environmental impacts of reopening inactive landfills where there is useful capacity remaining (GP Policy CI 14.2) and will initiate educational and other programs to reduce waste generation, increase diversion of solid waste away from landfills, promote recycling, discourage indiscriminate dumping, and identify new facilities for waste disposal in the County (GP Policies CI 14.4, D/CI 3.2).

2. **San Bernardino County Landfill Programs.** There are currently methane recovery systems in place at the County's five largest landfills, Victorville, Colton, Mid-Valley, San Timoteo, and Milliken. These methane recovery systems are in place in order to meet the requirements of Title 27, (SCAQMD) Rule 1150.1, and (MDAQMD) Rule 1126. The County expects that within five years there will be a methane recovery system in place at Barstow as well. [This program is incorporated into the current (2007) and 2020 unmitigated landfill emissions estimate.]
3. **Comprehensive Disposal Site Diversion Program (CSDSP).** A program initiated by the County that recovers waste for recycling at the landfill. This is a relatively new program and has been successful at increasing waste diversion from landfilling to recycling. The CSDSP program was implemented in 2007. The program successfully diverted 112,846 metric tons of waste in the 2007–2008 fiscal year and projected diversion rates are assumed to grow at a rate of 1.02 percent annually. This measure will contribute to the total reductions required under AB 1016.

GHG 4.2.3.2 SOLID WASTE/LANDFILLS GHG PLAN GOALS, OBJECTIVES AND STRATEGIES

As a compliment to the General Plan goals and policies stated above, the following GHG Plan goals, objectives and strategies reduce greenhouse gases related to the Solid Waste/Landfills sector.

GHG Goal SW 1: Reduce GHG emissions from waste through landfill methane recovery, waste diversion (including waste minimization, reuse, and recycling) and public education.

Objective GHG SW 1.1 Increase methane recovery at County landfills where such systems are currently installed.

Reduction Strategies

1. **Increase Methane Recovery.** The County will evaluate the performance of existing methane recovery systems at all County landfills where such systems are installed. Where these systems produce a recovery rate of less than 85%, they shall be improved so that they achieve an 85% effective capture for the Colton and Milliken landfills and the unlined portion of the Mid-Valley landfill and a 95% effective capture for the lined portion of the Mid-Valley landfill.

(Measure R2W1, Appendix A)
2. **Landfill Gas to Energy Projects.** The County will consider expanding its Landfill Gas to Energy Projects program to other landfills where the projects are cost-effective and technologically feasible.



(Measure R3W5, Appendix A)

3. **Additional Landfill Methane Controls.** The County will consider the implementation of additional methane controls at County landfills to include the following:
 - a) Use landfill gas extraction system, surface sampling, gas migration probe, and other available to data to get an accurate representation of methane generation at San Bernardino County landfills. This information could be used to accomplish the following:
 - Develop a GHG emission site priority list.
 - Develop strategies based on site priorities.
 - Install additional gas extraction wells as necessary in existing systems.
 - Pursue low tech solution at remote sites that do not have a power source.
 - b) Pursue further study of the chemical reactions of methane gas attenuation as it migrates through the cover soils at each landfill, and develop low power methods for improving these reactions.
 - c) Work with other agencies that are studying GHG emissions from landfills and develop partnerships where information and approaches are shared.
 - d) Further develop waste disposal alternatives such as recycling, waste-to-energy, aerobic digestion of organic materials, and other actions.

(Measure R3W4)

Objective GHG SW 1.2 Install methane recovery systems at County landfills where no such systems are currently installed.

Reduction Strategies

1. **Installation of Methane Recovery Systems at Barstow Landfill.** The County will install a methane recovery system at the Barstow Landfill within five years of the adoption of this plan.

(Measure R2W2, Appendix A)

2. **Installation of Methane Recovery Systems at Landers Landfill.** The County will install a methane recovery system at the Landers Landfill.

(Measure R2W3, Appendix A)

3. **Additional Installation of Methane Recovery Systems at Selected Landfills.** The County will consider the installation methane recovery systems at all landfills with 250,000 or more tons of waste in place where such system are not already installed, including closed landfills.



(Measure R3W1, Appendix A)

4. **Financing Mechanisms and Opportunities.** The County will consider pursuing all grant opportunities to help finance the installation of methane recovery systems and controls, the enhancement of waste diversion programs and public education programs focused on waste stream issues.

(Measure R3W2, Appendix A)

Objective GHG SW 1.3 Expand current waste reduction and recycling plans, including outreach and education programs.

Reduction Strategies

1. **Waste Reduction and Recycling Plans.** The County will expand its efforts relative to the County's Comprehensive Disposal Site Diversion Program to divert up to 11% of waste arriving at County landfills each year to recycling and composting programs.

(Measure R2W4, Appendix A)

2. **Construction and Demolition Debris Diversion.** The County will ensure that at least 50% of all construction and building materials and demolition debris will be diverted to recycling programs.

(Measure R2W5, Appendix A)

3. **County Waste Diversion Program.** The County will strengthen the County Diversion Program to reach a goal of 75% of waste diverted to recycling programs by 2020 through the implementation of one or more of the following measures.

(Measure R2W6, Appendix A)

- a. Expand current waste reduction and recycling plans, including outreach and education programs.
- b. Encourage businesses in the County to adopt a voluntary procurement standard prioritizing products that have less packaging or are re-usable, recyclable, or compostable; support policies at the State level that provide incentives for efficient product design and for reduced product and packaging waste.
- c. Increase disposal fees and/or reduce residential pick-up frequency.
- d. Provide compost bins at no cost.
- e. Expand list of recyclable materials.
- f. Provide waste audits.
- g. Make recycling and composting mandatory at public events.



- h. Establish an appliance end-of-life requirement.
 - i. For new development, require the use of salvaged and recycled-content materials and other materials that have low production energy costs for building materials, hard surfaces, and non-plant landscaping. Require sourcing of construction materials locally, as feasible. Encourage the use of cement substitutes and recycled building materials for new construction.
 - j. Research, evaluate, and report on best practices, innovations, trends, and developments in waste reduction practices, as relevant to GHG emissions reduction.
4. **City Waste Diversion Program.** The County will coordinate with incorporated cities within the County to help strengthen the waste diversion programs within their jurisdictions to reach a goal of 75% of waste diverted to recycling programs by 2020.
- (Measure R2W7, Appendix A)
5. **Waste Education Program.** The County will consider all opportunities to expand its public education program about commercial and residential recycling, waste reduction, composting, grass recycling and waste prevention.
- (Measure R3W3, Appendix A)
6. **Landfill Gas to Energy Projects.** The County will consider expanding its Landfill Gas to Energy Projects program to other landfills where the projects are cost-effective and technologically feasible.
- (Measure R3W5, Appendix A)

GHG 4.2.3.3 SUMMARY OF STATE ACTIONS TO REDUCE GHG EMISSIONS RELATING TO SOLID WASTE MANAGEMENT

The State Legislature took prior action relative to this sector of the GHG Plan through the adoption of SB 2176 in 2004, AB 32 in 2006 and SB 1016 in 2008. These actions directed or recommended the following:

1. Requires a 50% per capita disposal target (average of 50 percent generation in 2003 to 2006 expressed in terms of per capita disposal).
2. Recommends landfill methane control, increase the efficiency of landfill methane capture and high recycling rates, all of which are included as strategies that require County action.
3. Requires the County to divert 50% of the solid waste through source reduction, recycling and composting.

These measures were not quantified as reductions that could be counted on for future reductions separate from the County measures described above.

GHG 4.2.3.4 SUMMARY OF REDUCTIONS RELATING TO SOLID WASTE MANAGEMENT

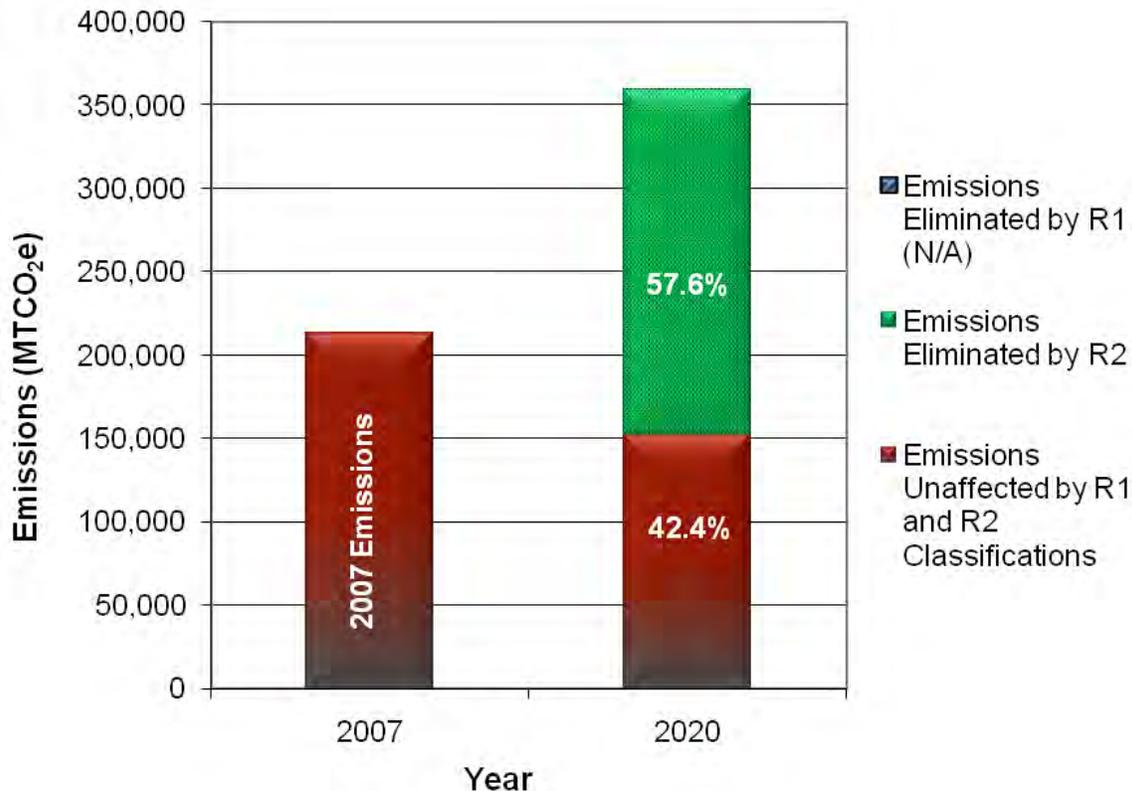
With the adoption and implementation of all proposed County GHG reduction strategies, the total emissions reductions related to Solid Waste is projected to decrease by 206,959 metric tons CO₂e, which is a 57.6 percent reduction from the 2020 unmitigated projections. Results of the emissions reduction calculations are shown in **Table 4-5**.

Table 4-5: External GHG Emission Reductions from Implementation of Solid Waste Strategies

Reduction Classification and Reduction Measures	GHG Reductions from 2020 unmitigated Waste Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
R1: Existing and proposed state and regional waste management measures that do not require County action		
NA		
R2: Existing and new measures that require County action		
R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	97,059	27.0
R2W2: Barstow Methane Recovery	37,935 ^a	10.6
R2W3: Landers Methane Recovery	8,471 ^b	2.4
R2W4: Comprehensive Disposal Site Diversion Program	26,390	7.3
R2W5: C&D Recycling Program	295	0.1
R2W6: County Diversion Programs — 75 Percent Goal ^c	4,118	1.1
R2W7: City Diversion Programs— 75 Percent Goal ^c	32,692	9.1
Total	206,959	57.6
R3: Existing and new waste measures – reductions not quantified or relied upon to achieve reduction goal		
R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP		
R3W2: Leverage Existing Financing Mechanisms and Opportunities		
R3W3: Waste Education Program		
R3W4: Additional Landfill Methane Controls		
R3W5: Landfill Gas to Energy Projects		
<i>Notes:</i> Reductions for these measures solely represent avoided methane emissions at landfills and assume that all waste reduction measures are implemented in combination.		
^a Attributed to waste in place methane reductions from Barstow as well as new waste planned for Barstow.		
^b Attributed only to existing waste in place at Landers.		
^c Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of County-generated waste by 2020.		
^d Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of City-generated waste by 2020.		

As depicted in **Figure 4-5** below, with the implementation of the reduction strategies included in this Plan, reduced emissions in 2020 will be approximately 29 percent lower than 2007 emissions.

Figure 4-5: External GHG Emission Reductions from Solid Waste/Landfill Measures



GHG 4.2.4 STATIONARY SOURCE SECTOR



The GHG emissions from stationary sources quantified in this GHG Plan result from fuel combustion (such as diesel, gasoline and propane) and fugitive emissions of methane (CH₄) and nitrous oxides (N₂O) at industrial facilities located in the County. The following categories were included in the inventory: oil and gas production (combustion), manufacturing and industrial, food and agricultural processing, fuel combustion, coatings and related processes, cleaning and surface

coatings, petroleum production and marketing, chemical, mineral processes, industrial processes, asphalt paving/roofing, and sewage treatment.

Stationary source emissions are grouped into two categories: Point Sources and Area Sources. Point Source emissions are from facilities having one or more pieces of equipment registered and permitted with the local air quality control boards (SCAQMD or MDAQMD) (e.g. power plants and manufacturing facilities). Area Source emissions are from numerous smaller facilities (e.g. gas stations, dry cleaners and restaurants) or the source of emissions (e.g. consumer products and architectural coatings), for which locations may not be specifically identified.

Industrial land use zoning districts (including Community Industrial and Regional Industrial) occupy 21,834 acres or 1.21 percent of the total unincorporated area. According to the County land use designations, the spheres have a total build-out potential of 304.2 million square feet of Industrial space. In addition, there are 92 active mines and processing plants in the County, including the largest rare earth mine in North America. Extensive aggregate mining is also a major component of the mining industry in the County. However, the primary source of stationary source emissions in the County is cement plants. Cement plant operations emit large quantities of GHG emissions, including fuel combustion, electricity use, and clinker production. The fuel combustion activities at these plants include those associated with cement production, building operations, power plants/cogeneration facilities, and any other activity that consumes fuel. GHG emissions from clinker production result from chemical reactions involved in producing the intermediate cement products from raw materials. There are 11 cement plants located in California, four of which are located in the County and three are located within the County's land use authority area. These three cement plants represent approximately 30 percent of GHG emissions from cement production in California. The County has permitting authority over these three operations.

GHG 4.2.4.1 BACKGROUND

The County's General Plan and Development Code contain policies and programs that guide development and also support the County's efforts to reduce GHG emissions reductions. The following General Plan (GP) policies, while not specifically quantifiable in terms of the amount of GHG reduction, effectively contribute to the County's reduction efforts.

The County is committed to ensuring good air quality for its residents, businesses, and visitors to reduce impacts on human health and the economy. In addition to continued coordination with the South Coast Air Quality Management District and Mojave Desert Air Quality Management District to improve air quality through reduction in pollutants from the region (CO 4.2), the County is committed to establishing special performance standards for industrial uses to control industrial odors, air pollution, dust, and other nuisances (LU1.2(2)).



**GHG 4.2.4.2 STATIONARY SOURCE
 GHG GOALS, OBJECTIVES AND STRATEGIES**

In addition to the General Plan policies described above, new industrial developments subject to County discretionary review authority, will be required to mitigate GHG emissions through the Development Review Process.

GHG 4.2.4.3 SUMMARY OF STATE ACTIONS TO REDUCE GHG EMISSIONS RELATING TO STATIONARY (INDUSTRIAL) SOURCES

The State Legislature took action relative to stationary sources through the adoption of AB 32 in 2006. The actions directed through adoption of AB 32 included reducing combustion emissions from oil and gas extraction, replacing internal combustion engines over 50 horsepower with electric motors, adoption of a cap and trade program including the cement sector which will help to reduce GHG emissions from cement production at cement manufacturing facilities and adoption of a per capita water use reduction goal to comply with the governors Executive Order S-14-08. These and other measures are more specifically described in Appendix A. Reduced emissions in 2020 would be approximately 26 percent lower than 2007 emissions.

4.2.4.4 SUMMARY OF REDUCTIONS RELATING TO STATIONARY SOURCES

With implementation of all State GHG reduction strategies the total emissions reductions related to Stationary Sources are projected to decrease by 1,049,067 MTCO_{2e}, which is a 33 percent reduction from 2020 business as usual projections.

Total estimated GHG percent reductions and quantities from the reduction measures included in Reduction Classifications R1 and R2 are presented below in **Table 4-6**.

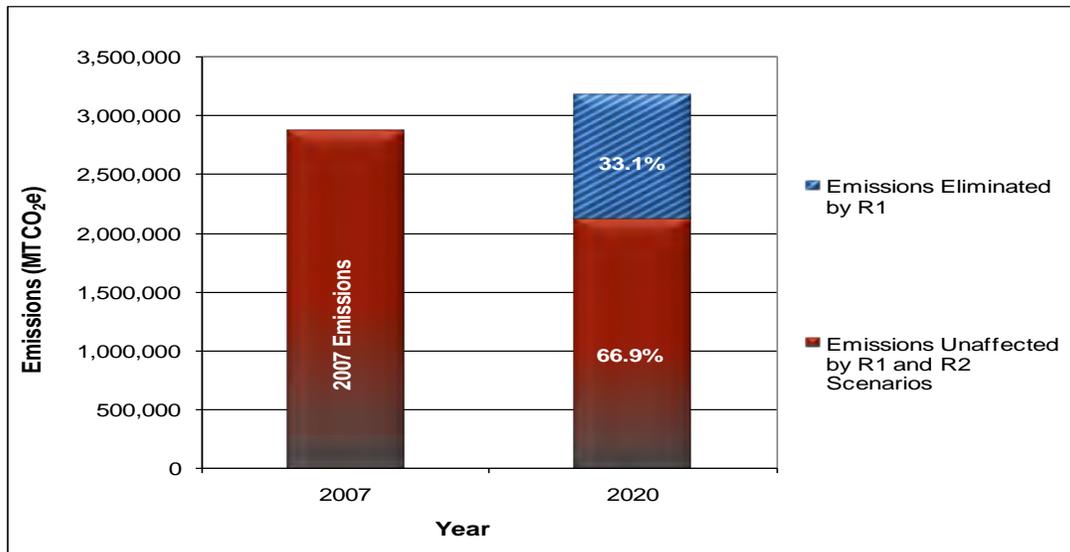
Table 4-6: External GHG Emission Reductions from Implementation of Stationary Source Strategies

Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Industrial Stationary Source Emissions (MTCO _{2e})	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
R1: Existing and proposed state and regional stationary source measures that do not require County action		
R1I1: Oil and Gas Extraction Combustion Related GHG Emission Reduction	49	0.002
R1I2: Stationary Internal Combustion Engine electrification	736	0.02
R1I3: Reduce Carbon Intensity at Cement Plants (Through Cap and Trade Program)	69,909	2.2
R1I4: Reduce Carbon Intensity at Concrete Batch Plants (Through Cap and Trade Program)	732,086	23.1
R1I5: Waste Reduction in Concrete Use (Through Cap and Trade Program)	246,288	7.8

Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Industrial Stationary Source Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
R2: Existing and new stationary source measures that require County action		
Development Review Process for new industrial and commercial projects	N/A	N/A
Total	1,049,067	33.1

With the implementation of these emission reduction strategies included in this Plan, by 2020 stationary source emissions will be approximately 28 percent lower than 2007 emissions. **Figure 4-6** below, graphically depicts this reduction.

Figure 4-6: External GHG Emission Reductions from Stationary Sources



GHG 4.2.5 AGRICULTURE AND RESOURCE CONSERVATION SECTOR



The preservation of open space and natural land covers preserves the carbon sequestration that occurs within natural vegetation. Although San Bernardino County does not have extensive forest areas compared to other parts of California (like the North Coast), the preservation of carbon sequestration in the County can help to avoid increase in GHG emissions.

Agriculture has historically been an important part of San Bernardino's economy and is dominated by the dairy industry and the related industries of calf production and forage crops. The County's agricultural diversity also includes numerous fruit orchards in the east Valley area and substantial nursery and vegetable production. However, in recent years agricultural uses within the County continue to decline as a result of the effects of urban expansion and economic considerations. As farmers relocate, agricultural uses often change to more specialized and high unit value crops that can be grown in less desirable (from the standpoint of urban development) terrain. In the desert region, field crop value declined due to a significant reduction in alfalfa acreage and poor range conditions due to a lack of rainfall and cost of water production or delivery. The overall net result of this situation is that the amount of vacant land that can be converted to most agricultural uses is steadily diminishing.

GHG 4.2.5.1 BACKGROUND

The County's General Plan and Development Code contain numerous policies and programs that guide development and also support the County's efforts to reduce GHG emissions reductions. The following General Plan (GP) policies, while not specifically quantifiable in terms of the amount of GHG reduction, effectively contribute to the County's reduction efforts.

The County protects its natural resources and open spaces, through compliance with the County's Scenic Resources Overlay District for new development; preservation and protection of scenic resources that contribute to a distinctive visual experience; and protection of scenic and open space qualities of cinder cones and lava flow areas of the County. The County also ensures that flood control and drainage improvements are designed in a way that preserves the scenic values of the County's streams and creeks. For example, consistent with the County's efforts to protect the public from flood hazards, encourage the use of open space and drainage easements, as well as clustering of new development, as stream preservation tools (GP Policy CO 5.4). Also, the Hazard and Resources Overlay Maps is utilized by the County to identify areas suitable or required for retention as open space. Resources and issues identified on the Overlays which indicate open space as an appropriate use may include: flood, fire, geologic, aviation,

noise, cultural, prime soils, biological, scenic resources, minerals, agricultural preserves, utility corridors, water supply and water recharge.

The County has established good working relationships with, and will continue to work with state and federal agencies to conserve critical habitat and minimize recreational uses in sensitive areas supporting protected or sensitive species. Specifically, County coordinates with these agencies to create buffers and mitigation banks for sensitive species within all the Planning Regions in the County that are greater than one-mile from state or federal lands. The County will also continue to coordinate with these resource agencies to ensure that their programs preserve rare and endangered species and protected areas of special habitat value, as well as conserve populations and habitats of commonly occurring species. Through its General Plan Policies (CO 1.2, 2.1, 2.2, 2.3 and 2.4)

The Conservation (CO) Element addresses the conservation, development, and use of natural resources. Through its General Plan Land Use Element, the County is also committed to ensuring that the distribution of land uses will be consistent with the maintenance of environmental quality, conservation of natural resources, and the preservation of open spaces (GOAL LU 7).

1. **Preservation of Natural Resources.** Through its GP Goal OS-1, County strives to provide plentiful open spaces, local parks and a wide variety of recreational amenities for all residents. Policies OS 1.1 through OS 1.9 are designed to support this goal, for example, through the utilization of appropriate land use categories (OS 1.1), supporting the establishment of “urban open space areas” (OS 1.4), and siting of new regional parks (OS 1.6). The County is committed to providing for the grouping or clustering of residential buildings where this will maximize the opportunity to preserve significant natural resources, natural beauty or open space without generally increasing the intensity of development otherwise possible (M/CO 1.3). County will also encourage the protection of natural features by using the Special Development District or Zone to implement Planned Development and Planned Residential Concepts. (Strategies R2NR1 and R3NR3 in Appendix A).
2. **Preservation of Orchards.** The County’s agricultural diversity also includes numerous fruit orchards in the east San Bernardino Valley area and substantial nursery and vegetable production. In addition to preserving prime agricultural lands (GP Policies CO 6.3, CO 6.4), which provide co-benefits for the sequestration of carbon dioxide, the County ensures that the distribution of land uses are consistent with the maintenance of environmental quality, conservation of natural resources, and the preservation of open spaces (GP Goal LU 7).
3. **Preservation of Forest Character.** In the Mountain region, the County is committed to maintaining the health and vigor of the forest environments, pursuant to its General Plan Goal M/CO 2. The County also ensures that developers utilize construction techniques for single family homes that will preserve the forest character of the region by minimizing disruption of land and vegetation during construction (GP Policy M/LU 1.10). In addition, areas in new developments



which are not suitable for habitable structures, for example, are offered for recreation, other open space uses, trails, and scenic uses. Retention of open space lands is also considered with modifications to a site to increase its buildable area. Potential measures used to set aside open space lands of all types include dedication to the County or an open space agency, dedication or purchase of conservation easements, and transfer of development rights (Measure R2NR1 and R3NR3 in Appendix A).

GHG 4.2.5.2 AGRICULTURE AND RESOURCE CONSERVATION GHG PLAN GOALS, OBJECTIVES, STRATEGIES

As a compliment to the General Plan goals and policies stated above, the following GHG Plan goals, objectives, and strategies will reduce greenhouse gases related to agriculture and resource conservation.

GHG Goal OS/RC 1: Reduce GHG emissions by retaining agricultural uses and conserving open space resources by supporting voluntary actions in cooperation with the resource conservation districts, the National Resource Conservation Service, the Department of Conservation, and private organizations.

Objective GHG OS/RC 1.1 Promote and encourage open space and natural resource preservation, as well as conservation of agricultural resources to allow for the sequestration of CO₂ through these resources.

Reduction Strategies

1. **Conservation Areas.** Preserve existing land conservation areas (especially forested areas, oak woodlands, and wetlands) that provide carbon sink benefits.

(Measure R3NR1, Appendix A)

2. **Compensation for Loss of Sequestration.** As part of Development Review, the County will consider requiring project-level compensation for loss of sequestration value through requirements for on-site and off-site tree planting and/or funding for restoration of forested areas, woodlands, and wetlands.

(Measure R3NR2, Appendix A)

3. **Urban Forestry.** The County will evaluate the feasibility of substantially expanding tree planting in the County, including evaluation of potential carbon sequestration from different tree species, potential reductions of building energy from shading, and GHG emissions associated with pumping of water used for irrigation. The pursue implementation of an urban forestry program if GHG emissions reductions exceed GHG emissions associated with implementation and water use.

(Measure R3NR3, Appendix A)

4. **New Agricultural Development Projects.** New agricultural developments subject to County discretionary review authority will be required to mitigate GHG emissions through the Development Review Process. Measure R3NR2 in Appendix A).

GHG 4.2.5.3 SUMMARY OF STATE ACTIONS TO REDUCE GHG EMISSIONS IN THE AGRICULTURE AND RESOURCE CONSERVATION SECTOR

The State Legislature took action relative to the agricultural sector through the adoption of AB 32 in 2006. The actions directed through adoption of AB 32 included voluntary measures to encourage the installation of methane digesters to capture methane emissions at large dairies. This reduction strategy is more specifically described in Appendix A. By 2020, this requirement will reduce emissions in California by 1,500 metric tons of CO₂e, which is a 3% reduction in the 2020 business as usual projections. The 2020 mitigated agriculture emissions are 23 percent lower than 2007 emissions due primarily to the expected reduction in the dairy herd over time in combination with the expansion of methane digestion.

The Agriculture sector accounts for less than one percent of the 2020 Business as Usual (unmitigated) external emissions in the County. With the adoption and implementation of all State GHG reduction strategies the total emissions reductions related to Agriculture is projected to decrease by 1,500 MTCO₂e, which is a three percent reduction from 2020 business as usual projected agricultural emissions.

GHG 4.2.5.4 SUMMARY OF REDUCTIONS IN THE AGRICULTURE AND RESOURCE CONSERVATION SECTOR

Total estimated GHG percent reductions and quantities from the R1 and R2 reduction measures are presented below in **Table 4-7**. Emission reductions for each measure are applied to the projected 2020 unmitigated emissions for the appropriate emissions source. Total reductions attributed to these measures from the unmitigated 2020 emissions would be three percent.

Table 4-7: External Emission Reductions from Implementation of Agriculture and Resource Conservation Strategies

Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Agriculture Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
R1: Existing and proposed state and regional stationary source measures that do not require County action		
R1A1: Methane Capture at Large Dairies	1,531	3.0
R2: Existing and new agriculture measures that require County action		
Development Review Process for new discretionary		

GHG Reductions from 2020 unmitigated Agriculture Emissions (MTCO₂e)		
Reduction Classification and Reduction Measure	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
agricultural development		
R3: Existing and new waste measures – reductions not quantified or relied upon to achieve reduction goal		
R3NR1: Conservation Areas		
R3NR2: Compensation for Loss of Sequestration		
R3NR3: Urban Forestry		
Total	1,531	3.0

GHG 4.2.6 WATER CONSERVATION SECTOR



Colorado River through Needles

Water conveyance requires electricity for pumping. Particularly where water is imported from the Central Valley and the Colorado River, pumping energy contributes to GHG emissions related to water use in the County.

The County faces water supply and distribution issues in common with all other counties in the Southern California region. The urbanizing areas of the County are dependent upon adequate quantities and qualities of potable water being available. At present, the majority of the County is dependent upon locally available supplies of groundwater. However imported water will play an increasing role in satisfying the demand for water throughout the County.

The County has a substantial role in promoting water conservation for new development and can help facilitate water conservation from existing development, in cooperation with local water districts and retailers.

GHG 4.2.6.1 BACKGROUND

The County’s General Plan and Development Code contain numerous policies and programs that guide development and also support the County’s efforts to reduce GHG emissions reductions. The following General Plan (GP) policies, while not specifically quantifiable in terms of the amount of GHG reduction, effectively contribute to the County’s reduction efforts.

The County’s steady growth in water usage coupled with two primary challenges: periodic drought and the population growth require the County to be diligent in its water supply and conservation programs. The County recognizes that new development could

substantially deplete groundwater supplies such that there could be a lowering of the local groundwater table level and is; therefore, committed to protecting groundwater resources (GP Policy S 2.4) and promoting activities/measures that facilitate the conservation, replenishment, reclamation and reuse of water and wastewater (GP policies CI 11.9, CO 5.3, D/CI 3.1, D/CI 3.7, D/CI 3.9, M/CI 4.1), consistent with County, state and/or federal policies and regulations. The County also, to the greatest extent feasible, retains existing groundwater recharge and storm flow retention areas as open space lands (GP Policy CI 11.10) and promotes the implementation of low-impact design principles to help control the quantity and improve the quality of urban runoff (GP Policy CI 13.2). In addition, the County promotes water conservation through landscaping requirements, including but not limited to, the use of native or drought-tolerant plants, xeriscape design, drip irrigation, and/or retaining maximum of 10 percent of the project parcel shall be retained in planted landscaped areas (GP Policy D/CI 3.4, D/CI 3.6, D/CI 3.8). The County also encourages water service agencies in the region to adopt and implement water conservation ordinances (GP Policy D/CI 3.5) in order to minimize water use. The County is also committed to working with other agencies such as the U.S. Forest Service to explore land exchange opportunities that would provide additional areas for open space, recreational opportunities and watershed protection (GP Policy M/OS 1.2).

GHG 4.2.6.2 WATER CONSERVATION GHG GOALS, OBJECTIVES AND STRATEGIES

As a compliment to the General Plan goals and policies stated above, the following GHG Plan goals, objectives, and strategies reduce greenhouse gases related to water use.

GHG Goal WC 1 Reduce GHG emissions associated with water use through conservation and efficiency measures
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Objective GHG WC 1.1 Support conservation and protection of water resources through the efficient use of water

Reduction Strategies

1. **County Water Efficient Landscape Ordinance.** In 2007, the County adopted a landscape ordinance that provided for the conservation and protection of water resources through the efficient use of water, appropriate use of plant materials suitable for climate and location, and regular maintenance of landscaped areas. On February 8, 2011, the Board of Supervisors adopted a comprehensive landscaping ordinance (Development Code Sections 83.10.010 et seq.) whose provisions meet or exceed the water conservation requirements development by the Department of water resources pursuant to Government Code Sections 64491 et seq. The County landscaping ordinance implements standards that manage outdoor water use through various conservation measures which include using a water budget and low impact development design strategies such as impervious surface reduction, pollution prevention measures to reduce the introduction of pollutants to the environment, and other integrated practices to reduce and cleanse runoff. This Legislative effort is aimed at meeting interdisciplinary goals such as



protecting the County's limited water supply, groundwater recharge, and storm water management.

(Measure R2WC1, Appendix A)

2. **Water Conservation Ordinance.** The County's Special District Department manages and operates County Service Areas 42 (Ore Grande), 64 (Spring Valley Lake, Victorville) and 70, Improvement Zones CG (Cedar Glen), F (Little Morongo, near Yucca Valley), J (Oak Hills), W-1 (Landers), W-3 (Hacienda) and W-4 (Pioneer Town), that provide water services to county residents. In response to drought conditions that existed within these county service areas and improvement zones (Districts), the Board of Supervisors, acting in its capacity as the governing body of the Districts, adopted ordinance No. SD 90-11, to preserve the water supply in those Districts. This water conservation ordinance prohibits excessive landscape watering, watering during peak daylight hours, watering non-permeable surfaces, excessive water use for noncommercial washing, water use resulting in runoff, and water leaks. The ordinance also requires efficient use of water for construction activities, low-flow toilets and showerheads for all new construction, the use of drought-tolerant plants and efficient landscape watering for all new development, pool covers, water conservation signage at hotels, and recycling of water used for cooling systems.

(Measure R2WC1, Appendix A)

3. **County Water Conservation Programs.** San Bernardino is implementing water conservation programs through public education and by partnering with conservation organizations to promote water conservation, highlighting specific water-wasting activities, such as watering non-vegetated surfaces and uncontrolled runoff, and using water to clean sidewalks. The Green County Initiatives program helps cities implement sustainable policies to reduce greenhouse gas emissions and conserve water. One such program is the Facilities Management Demonstration Garden, where the County is using water efficient landscaping to reduce its carbon footprint and water consumption.

(Measure R2WC1, Appendix A).

4. **Collaboration with Water Purveyors.** The County will collaborate with water purveyors to implement and promote conservation programs and actions including:
 - a. Water audit programs that offer free water audits to single family, multi-family, large landscape accounts and commercial customers; and
 - b. Programs to install ultra-low-flush toilets in commercial, industrial and institutional facilities

(Measure R2WC1, Appendix A):



5. **Recycled Water Use.** The County will establish programs and policies to increase the use of recycled water which may include the following actions (Incorporated into R2WC1):
 - a. Produce and promote the use of municipal wastewater and greywater that can be used for agricultural, industrial and irrigation purposes, including greywater systems for residential irrigation;
 - b. Inventory potential non-potable uses of water for potential substitution by recycled water;
 - c. Assess feasibility of producing and distributing recycled water for groundwater replenishment;
 - d. Collaborate with responsible agencies to encourage the use of recycled water where cost and energy efficiencies for its production, distribution and use are appropriate.

6. **Water Efficiency Training and Education.** The County will encourage water efficiency training and certification for irrigation designers and installers, property managers.

(Measure R2WC1, Appendix A)

7. **Manage Storm Water Runoff.** The County will implement low-impact development practices that maintain the existing hydrologic character of the site to manage storm water, reduce potential treatment, and protect local groundwater supplies.

(Measure R3WC1, Appendix A)

8. **Conservation Areas.** The County will preserve existing land conservation areas for watershed protection to protect water quality (reduces water treatment energy use), and protect local water supplies (reduces imported water energy use). Protection of conservation areas can also provide carbon sequestration benefits, particularly in forested areas.

(Measure R3WC2, Appendix A)

9. **Financing Mechanisms and Opportunities.** The County will pursue multiple financing mechanisms and opportunities available to the County for implementing water conservation measures.

(Measure R3WC3, Appendix A)

GHG 4.2.6.3 SUMMARY OF STATE MEASURES TO REDUCE WATER USE

State legislation (SBX7 7) requires a per capita urban water use reduction of 20 percent by 2020 compared to current conditions. The County would support the achievement of this goal through the measures described above. The County will also support this through



Internal Inventory reduction plan measures for County facilities in the unincorporated areas (see Appendix B).

As described above, the state has adopted a Renewable Portfolio Standard of 33 percent for 2020. The benefit of this measure for building energy was described above. However, this measure will also help to reduce the electricity emissions associated with water conveyance from outside the County into the County and thus will also help to reduce water conveyance GHG emissions.

GHG 4.2.6.4 SUMMARY OF REDUCTIONS ASSOCIATED WITH WATER CONSERVATION

Total estimated GHG percent reductions and quantities from the R1 and R2 reduction measures are presented below in **Table 4-8**. Emission reductions for each measure are applied to the projected 2020 unmitigated emissions for the appropriate emissions source. Total reductions attributed to these measures from the unmitigated 2020 emissions would be approximately 10,193 MTCO₂e.

Table 4-8: External GHG Emission Reductions from Implementation of Water Supply Strategies

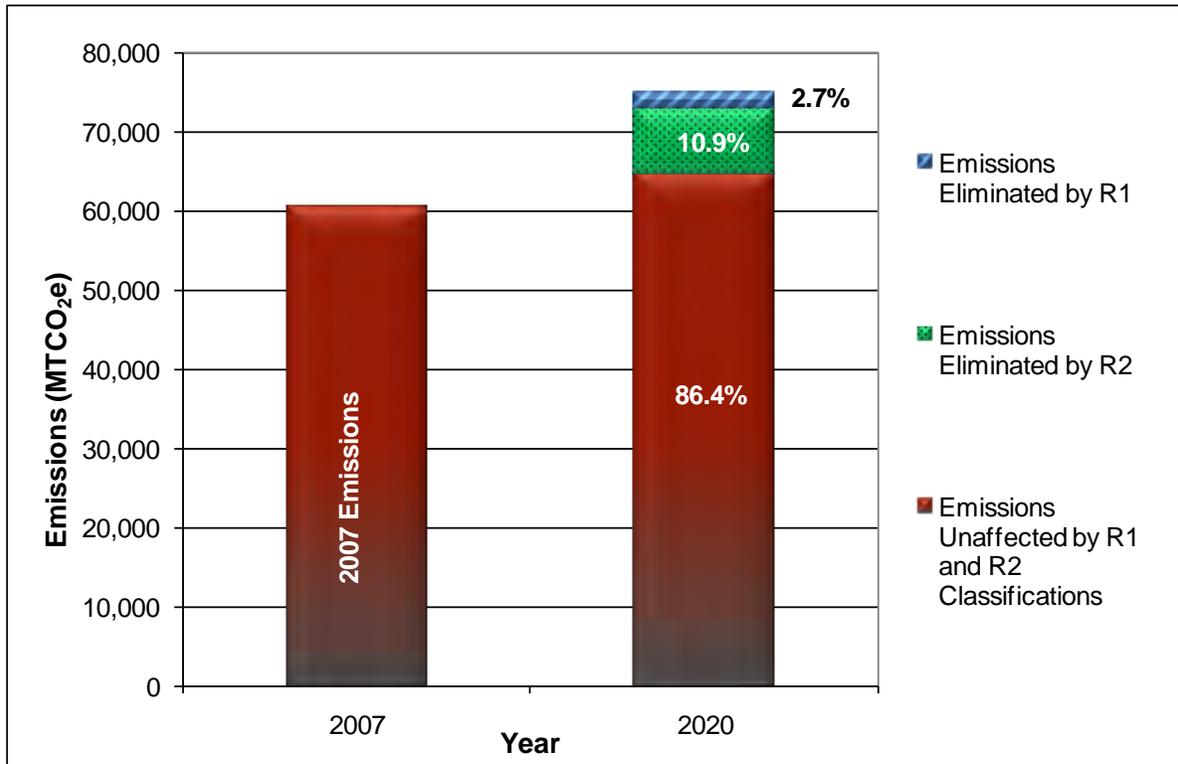
Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 unmitigated	Percent Reduction from 2020 unmitigated
R1: Existing and proposed state and regional water supply measures that do not require County action		
R1WC1: Renewable Portfolio Standard (33 percent by 2020)	2,007	N/A**
R2: Existing and new water supply measures that require County action*		
R2WC1: Per Capita Water Use Reduction	8,186	N/A**
Total	10,193	N/A**
R3: Existing and new water supply measures—reductions not quantified or relied upon to achieve reduction goal		
R3WC1: Manage Storm Water Runoff		
R3WC2: Conservation Areas		
R3WC3: Financing Mechanisms and Opportunities		

* Reductions assume measure will effect water importation from the State Water Project only. The County’s mandatory influence is only direct for new development; impact on existing development must come through voluntary measures in cooperation with water providers.

** These measures reduces emissions associated with electricity inside and outside the County, as well as from fuel combustion and fugitive emissions from wastewater treatment, thus a strict percent reduction compared to the water conveyance emissions is not provided. See Appendix A for further discussion

With the implementation of the emission reduction strategies included in this Plan, emissions from water supply and treatment emissions will be reduced approximately 14 percent from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately eight percent higher than 2007 emissions. **Figure 4-6** below, graphically depicts this reduction.

Figure 4-7: External GHG Emission Reductions from Water Conservation Measures



GHG 4.3 INTERNAL GHG EMISSIONS REDUCTION GOALS, OBJECTIVES AND STRATEGIES

The County can provide a leading example of GHG emissions reduction implementation through its management of County operations and facilities. The strategies described below apply to building energy, fleet management, solid waste management employee commuting, land management and County purchasing. Collectively, by 2020 these measures will reduce Internal Inventory emissions to a level 24 percent below Current emissions levels.



Internal GHG Goal: 1 Reduce GHG emissions from County facilities and operations.

GHG 4.3.1 BUILDING/ ENERGY EMISSIONS

Objective GHG EE1.1-INT: Reduce GHG emissions from the generation of electricity by improving energy efficiency and enhancing renewable energy generation.

Reduction Strategies:

1. **Require LEED Silver for New County Buildings.** All new County buildings (over 5,000 square feet) will be required to attain a minimum level of efficiency to satisfy LEED Silver or equivalent requirements where fiscally sensible. The minimum level of energy performance required to acquire a LEED Silver rating is 14 percent above code for newly constructed buildings.

(Measure R2E1-INT, Appendix B)

2. **Retrofit Existing Buildings.** The County will retrofit that portion of its pre-2008 buildings with energy efficiency features and alternative energy improvements. Not all buildings are large enough or otherwise suitable for retrofit, however, at least 25 percent of the County-owned buildings that existed in 2007 will be retrofit by 2020.

(Measure R2E2-INT, Appendix B)

3. **Increase Use of Combined Heat and Power Systems.** The County will install combined heat and power (CHP) systems at the Arrowhead Regional Medical Center. CHP systems utilize waste heat created during distributed power generation to provide heat locally. This technology lowers energy needed for heating and hence also lowers the GHG emissions associated with this heating.

(Measure R2E3-INT, Appendix B)

4. **Install Solar and Other Renewable Energy Sources on County Buildings.** The County will install renewable energy sources on a portion of County-owned buildings to offset at least ten (10) percent of the County's 2020 emissions from County-owned buildings. The installation of renewable energy sources will lower the amount of fossil fuel energy used by the County and emitted as indirect emissions by the County's main utility, Southern California Edison. The installations may include, for example:

- a. Installing solar collection systems on County-owned building roofs;
- b. Installing solar water heating for County-owned pools; and,
- c. Installing waste-to-energy systems at waste handling operations.

(Measure R2E6-INT, Appendix B)

5. **Heating, Ventilating and Air Conditioning (HVAC) Retrofit Program.** The County will continue to implement its County-wide HVAC retrofit program involving the installation of variable frequency drives (VFD), economizers, and controls to various mechanical systems. The buildings included in the program are: the County Government Center, Old Hall of Records, Library Administration and Regional Youth Education Facility (RYEF).

(Measure R2E7-INT, Appendix B)

6. **Solar Photovoltaic Installation Projects.** The County will install solar photovoltaic panels on the following two buildings: the High Desert Government Complex and the Joshua Tree new County building.

(Measure R2E8-INT, Appendix B)

7. **Training and Support.** The County will ensure that staff receives appropriate training and support to implement objectives and policies to reduce GHG emissions, including, but not limited to, the following:

- a. Providing energy efficiency training to design, engineering, building operations and maintenance staff;
- b. Providing information related to energy use and management, including data from the tracking and management system, to managers and others making decisions that influence energy use; and,
- c. Providing energy design review services to departments undertaking new construction or renovation projects, to facilitate attainment of LEED Silver or equivalent standards.

(Measure R3-E4, Appendix B)

8. **Other Energy Efficiency Related Activities.** In addition to these programs the County will also reduce energy consumption in its operations by:

- a. Utilizing incentives offered by Southern California Edison partnership;
(Measure R3E1-INT, Appendix B)
- b. Benchmarking existing buildings to rate the County's buildings' energy performance, set investment policies, and verify and track progress of improvement projects;
(Measure R3E2-INT, Appendix B)
- c. Linking utility payment/energy usage data into the computer aided facilities management database to enhance the County's energy usage data tracking and facilitate analysis of all County buildings;
(Measure R3E3-INT, Appendix B)
- d. Using energy saving design features such as east-west long axis oriented buildings, operable external shading devices on south facing facades, double



skin facades etc., and energy efficiency features above Title 24 standards.
(Measure R3E5-INT, Appendix B)

9. **Install Outlets To Support Use Of Small Tools and Equipment.** The County will install outdoor electrical outlets on buildings to support the use of electric lawn and garden equipment, and other tools that would otherwise be run with small gas engines or portable generators, when feasible and appropriate.

(Measure R3E7-INT, Appendix B)

GHG 4.3.2 FLEET/FUEL EMISSIONS

Objective GHG 1.2-INT: Reduce GHG emissions from vehicle and equipment engines.

Reduction Strategies:

1. **Implement Accelerated Turnover of Passenger/Light Duty Vehicles.** The County will accelerate its fleet replacement schedule to replace all of its passenger/light duty vehicles in the motor pool and 50 percent of the Fire Department fleet with the most fuel efficient vehicles practical, by 2020. This Measure will reduce GHG emissions faster than the implementation of Pavley I and Pavley II measures.

(Measure R2F1a-INT & R2F1b-INT, Appendix B)

2. **Replace Medium-Duty and Heavy-Duty Vehicles.** The County will replace its medium-duty and heavy-duty vehicle fleet (excluding County Fire vehicles) with new vehicles by 2020.

(Measure R2F2-INT, Appendix B)

3. **Accelerated Turnover of “Other” Vehicles.** In addition to retiring all passenger/light duty, medium duty, and heavy duty vehicles by 2020, the County will replace vehicles classified as “other,” with cleaner-burning diesel engines or alternative fueled engines, when feasible and appropriate. Other vehicles include off-road vehicles, construction equipment, marine vehicles, and stationary engines (i.e., generators).

(Measure R3F1-INT, Appendix B)

4. **Use Hybrid/ULEV Vehicles.** The County will replace retired vehicles with hybrid electric vehicles and/or ULEV that are 50 percent cleaner than average new model cars, when feasible and appropriate.

(Measure R3F3-INT, Appendix B)

5. **Fleet and Equipment Management and Monitoring.** The County will:

- a. Implement an early tire inflation program to monitor and ensure vehicle tire pressure is maintained to manufacturer specifications;
(Measure R3F3-INT, Appendix B)
- b. Implement additional measures for internal operations to reduce excessive idling, such as idle-free stickers, signage, tracking devices, and incentives ;
(Measure R3F4-INT, Appendix B)
- c. Implement a Smart Driving Policy for fuel economy;
(Measure R3F5-INT, Appendix B)
- d. Install global positioning systems (GPS) in all new vehicles (with some exceptions) to monitor mpg, idle time, and emission status;
(Measure R3F7-INT, Appendix B)
- e. Maintain all vehicles and equipment in good working order; and,
(Measure R3F6-INT, Appendix B)
- f. Develop a new fleet management program to assist in “right sizing” the fleet to the number of employees.

(Measure R3F7-INT, Appendix B)

GHG 4.3.3 SOLID WASTE/LANDFILL EMISSIONS

Objective GHG W1.3-INT: Reduce GHG emissions through improved management of waste handling and reductions in waste generation.

Reduction Strategies:

1. **Increase Methane Recovery at Mid-Valley, Milliken and Colton Landfills.** These landfills currently have methane recovery systems in place. However, the County will increase the methane recovery to achieve a capture rate of 95 percent at Mid-Valley and 85 percent at the Colton Landfill.

(Measure R2W-INT, Appendix B)

2. **Barstow Methane Recovery.** The County will install a methane recovery system at the Barstow Landfill aimed at capturing 75 percent of emitted methane from all waste currently in place.

(Measure R2W2-INT, Appendix B)

3. **Landers Methane Recovery.** The County will install a methane recovery system at Landers aimed at capturing 75 percent of emitted methane from all waste currently in place.

(Measure R2W3-INT, Appendix B)



4. **Methane Capture Systems at all Landfills with 250,000 or more Tons of Waste in Place (WIP).** The will explore the feasibility of installing a methane recovery system at landfills with 250,000 or more tons of WIP, including but not limited to Apple Valley (closed), big Bear (closed), Hesperia, (closed), and Yucaipa (closed). The County will also explore the feasibility of providing technical support, for the installation of methane recovery systems, to privately owned landfills within the County.

(Measure R3W1-INT, Appendix B)

5. **Financing Mechanisms and Opportunities.** The County will pursue all appropriate grant opportunities to help finance the installation of methane recovery systems and controls.

(Measure R3W2-INT, Appendix B)

6. **Additional Landfill Methane Controls.** The County will continue to assess, through the use of landfill gas extraction systems, surface sampling, gas migration probe, and other available techniques, the feasibility of installing additional methane capture systems at County landfills. In addition, the County will:
 - a. Pursue further study of chemical reactions of methane gas attenuation as it migrates through the cover soils as each landfill, and develop low power methods for improving these reactions;
 - b. Work with other agencies that are studying GHG emissions from landfills and develop partnerships where information and approaches are shared; and
 - c. Further develop waste disposal alternatives such as recycling, waste to energy, Aerobic digestion of organic materials, and other actions.

(Measure R3W4-INT, Appendix B)

7. **Landfill Gas to Energy Projects.** The County will pursue Landfill Gas to Energy (LFGE) projects at landfills where such projects are cost-effective and technologically feasible.

(Measure R3W5-INT, Appendix B)

Objective GHGW1.4-INT: Implement and/or expand current waste reduction and recycling plans, including outreach and education programs.

Reduction Strategies:

1. **Comprehensive Disposal Site Diversion Program.** The County's Comprehensive Disposal Site Diversion Program (CDSDP) recovers ~~post-~~ "post-diversion" waste for recycling at the landfill. Post-diversion is defined as the waste sent to landfill, after accounting for the County's municipal recycling and composting programs, which are accounted for in the 2020 total waste estimates. By 2020 the CDSDP program will divert an estimated 11% of waste arriving at



County landfills each year, increasing the current per capita diversion rate from 49% to approximately 54.5%.

(Measure R2W4-INT, Appendix B)

2. **Construction and Demolition Recycling Program.** The County requires a minimum diversion of 50 percent of construction and building materials, and demolition debris from landfills. In addition, the County also requires a detailed Diversion Plan that identifies the waste hauler and plan verification procedures before issuing building permits. The County anticipates that it will be diverting at least 60% of construction and building materials, and demolition debris from landfills by 2020.

(Measure R2W5-INT, Appendix B)

3. **County and City Diversion Programs—75 Percent Goal.** The County will continue to work with businesses within the County to expand current reduction and recycling plans through, among other things, outreach and education programs, by making recycling and composting mandatory at public events, by providing waste audits as well as establishing an appliance end-of life requirement. The County will also continue to work with the various cities within its jurisdiction to reduce waste and to increase the waste diversion rates from the current 55 to 75% by 2020

(Measure R2W6-INT and R2W7-INT, Appendix B)

4. **Financing Mechanisms and Opportunities.** The County will pursue appropriate grant opportunities to help finance the enhancement of waste diversion programs and public education programs focused on waste stream issues.

(Measure R3W2-INT, Appendix B)

5. **Waste Education Program.** The County will expand its community education programs designed to educate the public and assist residents with waste reduction, recycling and reuse activities.

(Measure R3W3-INT, Appendix B)

4.3.4 EMPLOYEE COMMUTE EMISSIONS

Objective GHG EC1.5-INT: Reduce employee vehicle trips and mitigate emissions impacts from municipal travel.

Reduction Strategies:

1. **Trip Reduction Program.** The County will implement programs to reduce employee vehicle trips, including:



- a. Expanding Vanpool Program. The County will provide incentives and infrastructure to strengthen and expand its vanpool programs by providing features such as pool vehicles, preferred parking, a website bulletin board to facilitate ride-sharing, expanding the number of work sites where the vanpools operate, offering greater flexibility in vanpool scheduling (i.e., allowing commuters to vanpool on the week days of their choice or allowing unscheduled use of vanpools), implementing vanpool education and rewards programs, and offering premium quality vanpool service options (such as high-quality vans, workstations, complimentary newspapers, drinks, etc.)

(Measure R2EC1-INT, Appendix B)

- b. Increasing the use of Ridesharing. The County will increase the use of ridesharing as an alternative to single occupancy driving through incentives such as gas cards, carpool awards, educational seminars, commuter-choice programs, commuter-tax benefits, guaranteed ride-home programs, commuter assistance and outreach, and parking incentives.

(Measure R2EC2-INT, R3EC2-INT Appendix B)

- c. Increasing the Use of Public Transportation. The County will create new or strengthen existing public transit incentives, including but not limited to, providing subsidized free passes for mass transit, parking incentives, commuter assistance and outreach, marketing promotion, improving rider information and education, creating park-and-ride facilities, and providing transit maps and guides.

(Measure R2EC4-INT, Appendix B)

- d. The County will reduce emissions by encouraging telecommuting, compressed work weeks, and off-peak work hours, where appropriate.

(Measures R3EC1, Appendix B)

2. **Increase Bicycling and Walking.** The County will promote and support the use of bicycles as transportation through the following:

- a. Providing bicycle stations with secure parking and storage areas;
- b. Providing a bicycle safety program and information about safe routes to work (cycling maps);
- c. Creating education programs; and
- d. Reimbursing employee cycling mileage expenses.

(Measure R2EC3- INT, Appendix B)

3. **Increase Use of Clean Air Vehicles.** The County will implement commuter assistance, outreach, and educational programs focused on encouraging employees to purchase hybrids and alternative fueled vehicles, and implementing parking



incentives. Where appropriate, the County will also pursue installation of electric vehicle charging stations at County facilities to encourage use of plug-in hybrids and electric vehicles.

(Measure R2EC5-INT, Appendix B)

GHG 4.3.5 CARBON SEQUESTRATION STRATEGIES

Objective GHG CS1.6_INT: Manage vegetation stock to reduce GHG emissions.

Reduction Strategies:

1. **Tree Management.** The County will maintain and increase its tree inventory, and coordinate tree maintenance responsibilities with all responsible departments, consistent with best management practices

(Measure R3CS1-INT, Appendix B)

2. **Landscaping.** The County will evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping and will install or replace vegetation with drought-tolerant, low maintenance native species or edible landscaping that can also provide shade and reduce heat-island effects.

(Measure R3CS2-INT, Appendix B)

GHG 4.3.6 COUNTY PURCHASING STRATEGIES

Objective GHG EE1.7-INT: Use purchasing power to promote reductions in GHG emissions by the suppliers of its goods and services.

Reduction Strategies

1. **Office Equipment Procurement Standard.** The County will adopt purchasing practices and standards to support reductions in GHG emissions, including a requirement that all office equipment be energy-efficient (ENERGY STAR rated), the use of recycled materials, and purchasing from manufacturers that have implemented green management practices. ENERGY STAR office equipment would have average energy savings of 50 percent from currently used office equipment.⁸

(Measure R2E4-INT, Appendix B)

2. **Leasing Procurement Standard.** Buildings leased by the County will be required to have at least 20 percent lower energy intensity than buildings leased in 2007.

⁸ ENERGY STAR office equipment uses 30–75 percent less energy than conventional equipment (Energy Star 2009).



This Measure requires benchmarking any building being considered for lease by the County. Benchmarking is the process of creating a measure of a building's energy intensity, expressed in kilowatt hours (kWh) per square foot and cubic feet natural gas per square foot.

(Measure R2E5-INT, Appendix B)

3. **Contracting Practices.** The County will establish bidding standards and contracting practices that encourage GHG emissions reductions, including preferences or points for the use of low or zero emissions vehicles and equipment, recycled materials, and provider implementation of other green management practices.

(Measure R3E8-INT, Appendix B)

GHG 4.3.7 SUMMARY

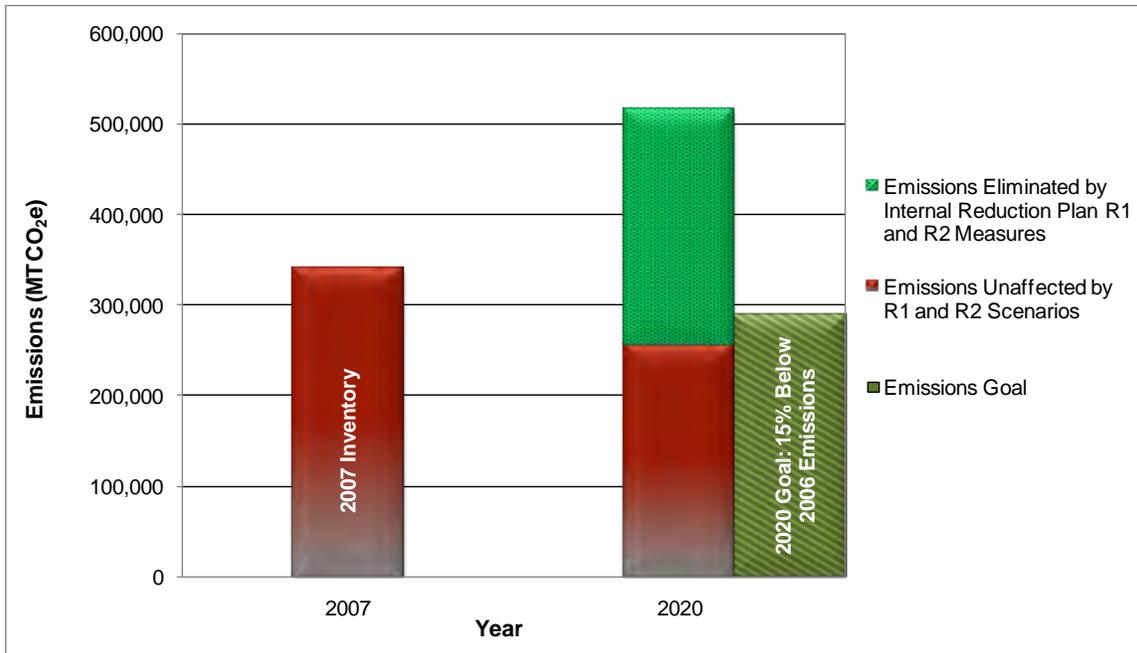
The Internal Inventory reduction strategies described in this Plan provide more than sufficient emission reductions to meet the County's 2020 goal to reduce emissions 15 percent below Current levels. As shown in **Table 4-9** below, the Internal Inventory measures will result in a reduction totaling 260,692 MTCO₂e.

Table 4-9: Internal GHG Emission Reductions from Implementation of Internal Strategies

Sector	2020 Reduction (MTCO ₂ e)		
	State Measures	County Measures	TOTAL
Solid Waste/Landfills	0	206,960	206,960
Building Energy	15,892	17,543	33,435
Vehicle Fleet/Fuels	11,179	4,467	15,647
Employee Commute	0	4,651	4,651
Total	27,071	233,621	260,692

With implementation of the reduction measures for the Internal Inventory by 2020, GHG emissions will be approximately 24 percent lower than 2007 emissions. **Figure 4-8** below graphically depicts this resolution.

Figure 4-8: Summary of Internal GHG Emission Reductions





CHAPTER 5.0

PUTTING THE PLAN INTO ACTION

Success in meeting the County's GHG emission reduction goal will depend on cooperation and participation by County departments, residents, businesses, and other entities in the County's LUA. As with other administrative responsibilities of the County, the level of implementation will depend upon adequate funding. Budgetary considerations regarding Plan implementation will be balanced with other County obligations. Yet, in spite of current fiscal constraints, the County anticipates that it will be able to achieve the overall target of GHG Emissions Reduction by 15% of the 2007 level by 2020. The County believes that this can be accomplished because this Plan builds on a foundation of various activities that the County has already been undertaken and incorporated into its normal operating procedures. The reduction measures that are included in this Plan, which are under County jurisdiction and control, can be implemented by 2020 with current and expected future County revenues. Supplemental funding through grants and sources will be sought out to augment County revenues in cases where accelerated or expanded implementation can be achieved.

This section outlines key steps that the County will follow for the implementation of this Reduction Plan. Some steps will occur in sequence and some concurrently.

GHG 5.1 ADMINISTRATION AND STAFFING

The County will establish a team from among existing County Executive Staff and Department Heads to oversee GHG Plan implementation. Designated Executive Staff and Department Heads will form the County GHG Reduction Team (GRT) to support and guide the County's efforts to reduce emissions.

An Implementation Coordinator will be selected to serve as team leader and coordinate implementation of the GHG Reduction Plan.

The County GRT, reporting to the County Executive Officer (CEO), will be responsible for implementing this Reduction Plan, coordinating all County departments, and recommending modifications and changes to the Reduction Plan over time.

The GRT will include the following departments, but will be expanded as needed to ensure coordinated leadership in Plan implementation:

- *County Executive Office.* The CEO's office can provide economic, financial, and administrative guidance and support to the GRT.
- *Economic Development Agency.* This agency can provide expertise in evaluating and managing the economic impacts of the plan.



- *Land Use Services Department.* LUSD can provide expertise in the use of County code and policies to implement Reduction Plan measures through the project entitlement process and provide long-term planning support.
- *Architecture and Engineering.* This department can provide technical expertise in the development of code requirements and the evaluation of technical feasibility of different reduction measures.
- *Facilities Management.* This department has been and will be implementing energy efficiency measures for County buildings and thus can provide expertise on crafting green building requirements and programs for the community at large.
- *Public Works.* The Transportation and Land Development and Construction divisions can provide expertise on use of alternative fuel vehicles for transportation and for construction, as well as use of solar messaging boards and other energy-saving measures.
- *Fleet Management.* This department can provide expertise in alternative fuel vehicles and infrastructure for both internal operations and private fleet operations.
- *Human Resources.* This department can provide expertise in ride-share activities, telecommute operations and flexible work schedules.
- *Special Districts.* This department can provide expertise in recreational facilities, senior citizen/community centers and in similar functions to Public Works and Solid Waste related to construction and waste management.
- *Solid Waste Management.* This division can provide expertise in the implementation of waste diversion and landfill methane components of the plan.

The Implementation Coordinator will be responsible for monitoring and reporting on progress towards meeting the 2020 reduction goal and will have the following responsibilities:

- Securing long-term financing for reduction programs and coordinating the budget for emissions reduction planning.
- Coordinating GRT meetings and the implementation of specific GRT identified actions.
- Establishing regional partnerships with cities in the County, utilities (including Southern California Edison and Southern California Gas), SANBAG, local businesses, non-profit organizations, and other stakeholders to leverage and maximize efficiency of emissions reduction efforts.
- Conducting periodic outreach efforts to involve the entire community in emissions reduction planning.
- Developing a protocol for regular reporting on reduction measures and progress towards meeting the emissions goals, and coordinating periodic monitoring of emissions reductions.



- Reporting periodically to the GRT, the CEO, the Board of Supervisors, and other boards and commissions on emissions reduction progress.
- Identifying and recommending new actions and programs or modifications to current actions and programs, as data becomes available on cost effectiveness, new revenue sources appear, and technology improvements bear fruition.
- Tracking state and federal legislation and its applicability to the County

GHG 5.2 FUNDING AND BUDGETING

Implementation of the GHG Plan will require creative, continuing and committed funding in order to work. Local, regional, state, and federal public sources of funding will be needed along with the substantial involvement of the private sector. The Reduction Measures labeled as R1 measures are within the federal, state and regional agency authority and responsibility for implementation. The County is prepared to implement all R2 and R3 measures by 2020. However, for the majority of these measures that are within the authority of the County to implement, the measures are anticipated to be in a start-up or continuing operational mode within four years of the adoption of the GHG Plan. Certain measures that involve significant capital improvements such as methane recovery systems at County landfills or retrofit of energy systems at County buildings will be done in accordance with existing capital improvement programs of County Departments such as Solid Waste Management and Facilities Management.

As one of the first priorities for implementation of the plan, the County will assess the on-going or planned activities currently anticipated by County Departments that make a direct or indirect contribution to GHG reduction. The costs of implementing the GHG reduction measures identified in this plan will take into account the costs and staff resources as well as the benefits and cost savings of proposed implementation actions. The County will conduct a cost-effectiveness analysis in cases where there may be limited staff or funding resources in order to identify the highest priority actions. The GRT will establish implementation priorities for annual department budgets based on funding available, priority actions and other factors relevant to building departmental annual work programs. Implementation of the GHG Emissions Reduction Plan will be integrated into the annual work program and budget of each of the key County Departments that are part of the GRT and will be approved by the Board of Supervisors as part of the annual County budget approval process. The GRT Implementation Coordinator will work with each of the GRT participating departments to develop a tracking and accounting process that will facilitate monitoring and reporting of implementation. The tracking and accounting process will provide for an orderly and systematic method for calculation of GHG emission reductions to assist with periodic adjustments, if needed, and for future “re-inventorying” of GHG emissions.

While all of the R2 and R3 measures are expected to be fully implemented by 2020, there may be opportunities to accelerate the timing or extent of implementation through grants, tax incentives and other funding sources. The County will continue to explore such opportunities. For example, Clean Water Act or Clean Air Act grants could assist in earlier completion of specified methane recovery systems at landfills that are currently planned by the County, but may be programmed in out years closer to 2020 based on existing capital improvement plans. Likewise, such federal



grants could assist with improvements to water treatment or water delivery systems or use of treated water for landscaping and other non-potable water use purposes. The following different funding options will be explored by the GRT:

- *State and Federal Grants and Low-interest Loans.* As described below there is a variety of grant and loan programs that exist in various sectors.
- *Support from Local Businesses, Non-Profits, and Agencies.* Opportunities for public-private partnerships (like the existing SCE partnership) exist to provide cooperation on many aspects of the Reduction Plan including energy efficiency retrofits, waste minimization, transit promotion, and education.
- *Self-Funding and Revolving Fund Programs.* Innovative programs to fund residential solar investments.
- *Agreements with Private Investors.* Energy service companies (ESCOs) and other private companies can finance up-front investments in energy efficiency and then be reimbursed through revenues from energy savings.
- *Carbon Offsets.* With an emerging offset market, there will be opportunities to fund reduction efforts through the sale of offsets. In particular, this may be an opportunity for the County related to reductions of landfill methane given that the County landfills receive most of the waste of the entire County while only being responsible for generating a minor (perhaps 15 percent) amount of total waste.
- *Taxes and Bonds.* Various municipalities have used targeted finance instruments for solar, transportation, vehicle improvements, and landfill methane controls.

Given that finance availability is critical to implementing many measures, a review of current and potential funding sources was completed for the different sectors covered in this Plan and is presented below to help early phase implementation of the GHG Plan.

Whether at the federal, regional or state level, it appears likely that there will be some form of a cap and trade system in place within several years. This system, depending on its particular character, is likely to influence energy prices (such as for electricity, natural gas, and vehicle fuels), and may make currently cost-ineffective measures more economically feasible

GHG 5.2.1 ENERGY EFFICIENCY AND RENEWABLE ENERGY FUNDING

Federal Energy Efficiency Community Block Grants (EECBG)

As part of the stimulus package (the “American Recovery and Reinvestment Act” or ARRA), signed into law by President Obama in spring 2009, block grants are available for energy efficiency planning and improvements in the building, transportation, and other sectors. The purpose of the EECBG Program is to assist eligible entities in creating and implementing strategies to: reduce fossil fuel emissions in a manner that is environmentally sustainable and that maximizes, to the greatest extent practicable, benefits for local and regional communities; reduce the total energy use of the eligible entities; and improve energy efficiency in the building sector, the transportation sector, and other appropriate sectors. Eligible activities include: development of an energy efficiency and conservation strategy; technical consultant services; residential and commercial building energy audits; financial incentive programs; energy efficiency retrofits; energy efficiency and conservation programs for buildings and facilities; development and implementation of certain transportation programs; building codes and inspections; certain distributed energy projects; material conservation programs; reduction and capture of methane and greenhouse gases from landfills and dairies; efficiency traffic signals and street lighting; renewable energy technologies on government buildings; and other appropriate activity.

Federal Tax Credits for Energy Efficiency

On October 3, 2008, President Bush signed into law the “Emergency Economic Stabilization Act of 2008.” This bill extended tax credits for energy efficient home improvements (windows, doors, roofs, insulation, HVAC, and non-solar water heaters). Tax credits for these residential products, which had expired at the end of 2007, will now be available for improvements made during 2009. However, improvements made during 2008 are not eligible for a tax credit. The bill also extended tax credits for solar energy systems and fuel cells to 2016. New tax credits were established for small wind energy systems and plug-in hybrid electric vehicles. Tax credits for builders of new energy efficient homes and tax deductions for owners and designers of energy efficient commercial buildings were also extended.

(See: http://www.energystar.gov/index.cfm?c=products.pr_tax_credits.)

SCE Energy Efficiency / Renewable Energy Incentives

- *Savings By Design* (for new non-residential construction): Design assistance, owner incentives, and design team incentives.
- *Standard Performance Contract Incentives*: Lighting (\$0.05/kWh), Air Conditioning and Refrigeration (\$0.14/kWh), other (\$0.08/kWh).
- *California New Homes Program (CANHP)*: New Residential Construction: approximately \$500–\$2,000 / home.
- *Direct Install Program* (business customers with less than 100 kW demand): Free energy analysis; free lighting, refrigeration, and LED exit sign upgrades; free installation.



- *Retro-commissioning Program*: Free analysis, incentives for implementing energy efficiency measures, and free training.
- *California Solar Initiative (CSI) and New Solar Homes Partnership (NSHP)*: Solar rebate program for existing (CSI) and new (NSHP) buildings: ~\$2.50/Watt installed.
- Industrial Energy Efficiency Program.
- Various other commercial incentive/rebate programs (see <http://www.sce.com/b-rs/commercial/>).

Metropolitan Water District of Southern California (Metropolitan) Incentives

Metropolitan has rebates for homeowners, multi-family developers, businesses, and homebuilders and incentives related to water consumption under the Be Water Wise program (see <http://www.bewaterwise.com/rebates01.html>).

Inland Empire Utility Agency (IEUA)

IEUA offers a number of rebates for the residential, commercial, industrial, and municipal sectors (see <http://www.ieua.org/rebate/rebate.html>).

Clean Renewable Energy Bonds (CREBs)

CREBs can be used by certain entities—primarily in the public sector—to finance renewable energy projects. The list of qualifying technologies is generally the same as that used for the federal renewable energy production tax credit. CREBs may be issued by electric cooperatives, government entities (states, cities, counties, territories, Indian tribal governments, or any political subdivision thereof), and certain lenders. The advantage of CREBs is that they are issued—*theoretically*—with a zero (0) percent interest rate. The borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. (See http://www.irs.gov/irb/2007-14_IRB/ar17.html.)

AB 811 Financing Districts

AB 811 permits the creation of assessment districts to finance installation of distributed generation renewable energy sources or energy efficiency improvements that are permanently fixed to residential, commercial, industrial, or other real property. The use of such a district can remove the up-front cost or up-front financing as an impediment to property owners who would like to install energy efficiency upgrades or renewable energy systems. Financing is repaid through the property tax bill and repayment obligations remain with the property when it is sold to a new owner.¹

¹ AB811 Financing districts are currently constrained by Fannie Mae and Freddie Mac mortgage requirements. It is presumed that this constraint will be overcome in the future and/or alternative financing mechanisms can be developed to support this plan.



GHG 5.2.2 TRANSPORTATION FUNDING

Federal Energy Efficiency Community Block Grants (EECBG)

As described above, eligible activities include development and implementation of certain transportation programs and efficiency traffic signals and street lighting.

Measure I

Measure I authorizes SANBAG to impose a half cent retail transactions and use tax applicable in the incorporated and unincorporated areas of the County for the 20-year period between April 1, 1990 and March 31, 2010. By approving Measure I, County voters guaranteed that all of the funds collected would be expended in the County for certain types of transportation projects. Measure I will generate approximately \$1.8 billion for transportation improvements in the County throughout the life of the 20-year sales tax.

Regional Improvement Program (RIP)

The RIP is funded from 75 percent of the funds made available for transportation capital improvement projects under the State Transportation Improvement Program (STIP). This program targets urban projects that are needed to improve transportation within the region. SANBAG recommends to the California Transportation Commission (CTC) the selection of these projects, which can include state highway improvements, local roads, public transit, intercity rail, grade separations, and more.

Interregional Improvement Program (IIP)

The IIP is funded from 25 percent of the funds made available for transportation capital improvement projects under the STIP. This program targets projects that are needed to improve interregional movement of people and goods. Caltrans recommends to the CTC the selection of these projects, which can include state highway improvements, intercity passenger rail, mass transit guideways, or grade separation projects. SANBAG participates in this process by supporting or recommending the most cost-effective projects for implementation.

Regional Transportation Improvement Program

SANBAG participates in the development of the Regional Transportation Improvement Program (RTIP), assembled by the Southern California Association of Governments (SCAG). The RTIP is a listing of all capital transportation projects proposed over a six (6)-year period for the SCAG region. Projects include highway improvements, transit, rail and bus facilities, carpool lanes, signal synchronization, intersection improvements, freeway ramps, and other related improvements. In the SCAG region, updates are made to the RTIP every two years, during even-numbered years.

Passenger Rail Short Range Transportation Plan



This program funds substantial passenger rail improvements within the San Bernardino Valley. In addition to setting aside SANBAG's share of capital improvements on all three (3) passenger rail lines, SANBAG is also proposing major investments extending passenger rail service from the City of San Bernardino to the City of Redlands and extending Los Angeles County's METRO Gold Line beyond the City of Azusa to a new terminus in the City of Montclair within San Bernardino Valley, as approved in the Measure I extension expenditure plan of 2004. The sum of all these investments in rail is \$290,426,000. Of this total, \$91,300,000 is expected from the federal New/Small Starts program and \$19,606,000 from California State transportation funds.

San Bernardino County Public Transit—Human Services Transportation Coordination Plan

Federal Transit Administration (FTA) Section 5310 provides capital assistance for the purchase of vehicles and associated equipment by non-profit agencies for the provision of transportation to elderly individuals and individuals with disabilities for whom mass transportation services are unavailable, insufficient, or inappropriate.

Transportation Development Act: Article 3 Biennial Call for Projects

SANBAG Board of Directors approved a call for projects for city and County projects related to the construction of pedestrian and bicycle facilities, as well as improvement projects for transit stops. The Transportation Development Act (TDA) provides for two (2) percent of the Local Transportation Funds (LTF) to be made available for these purposes.

GHG 5.2.3 WASTE REDUCTION FUNDING

Resource Conservation Funds 2009

The USEPA Region 9 is soliciting proposals to fund projects that address solid waste reduction and management. Funds will be awarded pursuant to Section 8001 of the Resource Conservation and Recovery Act (RCRA), 42 USC §6981. Funding will be in the form of cooperative agreements and/or grants. Funds will be awarded to applicants carrying out projects that serve the following states and territories: Arizona, California, Hawaii, Nevada, the U.S. territories in the Pacific Ocean, and the lands in Indian Country belonging to over 140 federally recognized tribes which fall under USEPA Region 9's geographic area. The aim of this funding is to support innovative ideas with the goal of fostering positive change. Projects may include studies, surveys, investigations, demonstrations, training, and public education programs. All demonstration projects must demonstrate applications, technologies, methods, or approaches that are new, innovative, or experimental. A demonstration project that is carried out through a routine or established practice is not eligible for funding. Under this announcement, USEPA Region 9 anticipates awarding approximately two to four cooperative agreements and/or grants totaling approximately \$120,000. USEPA Region 9 anticipates that each grant or cooperative agreement will range in size from approximately \$20,000 to \$100,000.

See <http://www.epa.gov/region09/funding/rcra.html> for additional details.



California Integrated Waste Management Board Grants and Loans

The CIWMB offers funding opportunities authorized by legislation to assist public and private entities in the safe and effective management of the waste stream. See <http://www.ciwmb.ca.gov/grants/> for more details.

GHG 5.2.4 WATER CONVEYANCE AND TREATMENT FUNDING

Clean Water State Revolving Funds (CWSRFs)

CWSRFs fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management. CWSRFs have funded over \$63 billion, providing over 20,700 low-interest loans to date.

(See <http://www.epa.gov/owm/cwfinance/cwsrf/index.htm> for more details.)

CWSRF's offer:

- *Low Interest Rates, Flexible Terms.* Nationally, interest rates for CWSRF loans average 2.1 percent compared to market rates that average 4.3 percent. For a CWSRF program offering this rate, a CWSRF funded project would cost 18 percent less than projects funded at the market rate. CWSRFs can fund 100 percent of the project cost and provide flexible repayment terms up to 20 years.
- *Funding for Nonpoint Source Pollution Control and Estuary Protection.* CWSRFs provided more than \$240 million in 2007 to control pollution from nonpoint sources and for estuary protection, more than \$2.6 billion to date.
- *Assistance to a Variety of Borrowers.* The CWSRF program has assisted a range of borrowers including municipalities, communities of all sizes, farmers, homeowners, small businesses, and nonprofit organizations.
- *Partnerships with Other Funding Sources.* CWSRFs partner with banks, nonprofits, local governments, and other federal and state agencies to provide the best water quality financing source for their communities.

GHG 5.3 TIMELINE AND PRIORITIZATION

The County will develop an implementation schedule based on the completion of the cost-effectiveness analysis and assessment of existing and planned County activities currently programmed by the County as part of its on-going provision of services. Prioritization will be based on the following factors:

- Cost effectiveness
- GHG reduction efficiency
- Availability of funding



- Level of County Control
- Ease of implementation
- Length of Time required to implement

In general consideration of these factors, the following is an outline of key priorities for three (3) phases starting in 2011 through 2020.

- **Phase 1 (2011–2012):** Development of key programs (such as continuation of the Green County Program adopted in 2007, warehouse solar program, expansion of waste diversion goal to 60 percent, etc.), completion of key planning efforts (e.g., implement DRP process into development permit processing procedures, integrate regional land use/transportation planning); implementation of most cost-effective measures (e.g., energy efficiency retrofits at County facilities and continuation of retrofits existing housing of low-income families, first tier landfill controls, rideshare/carpool measures, etc.); and support of voluntary efforts.
- **Phase 2 (2013–2015):** Continued implementation of Phase 1 measures, implementation of second tier measures (expand waste reduction target to 70 percent, new building solar installations, next level of landfill controls, etc.); and implementation of key planning outcomes from Phase 1 (transit-oriented development, etc.)
- **Phase 3 (2015–2020):** Continued implementation of Phase 1 and Phase 2 measures, implementation of third tier of measures (expand waste reduction target to 75 percent, next level of landfill controls, etc.).

Because the reduction target of this GHG Reduction Plan is aggressive, success in meeting the GHG Reduction Plan goals depend on some flexibility in the GHG reduction actions. While the County is committed to implementing the reduction measures and meeting the goals of this Reduction Plan, flexibility must be maintained in order to be successful. Successful implementation of the reduction measures in this Plan may be implemented through various options. The goals of each reduction measure can often be achieved through a variety of means, especially those related to building energy efficiency. For example, the County has already established procedures to use Green Building practices for new County built facilities that require adherence to energy efficient design as required by reduction measures R2E3 and R2E4. Another example of the County's aggressive actions to reduce its internal emissions inventory is a recently constructed new County Library met the Gold Standard for Green Building practices. Private sector development will need to comply with the Development Review Process for Reduction of GHG Emissions The process provides a means for streamlined review by incorporating design features that can achieve GHG emissions reductions through many combinations of actions including, but not limited to: installing energy efficient appliances, lighting, and HVAC systems; installing solar panels and solar water heaters; siting and orienting buildings to optimize conditions for natural heating, cooling, and lighting; installing top-quality windows and



insulation; and incorporating natural shading, skylights, and reflective surfaces as well as smart growth and compact and mass transit oriented development design measures.

Table 5-1 presents the anticipate phasing sequence for the GHG reduction measures.

Table 5-1: Anticipated Phasing of External GHG Reduction Measures

Emissions Reduction Measures	Phase
Building Energy	
R2E1: Residential Energy Efficiency Retrofits	1
R2E2: Commercial Energy Efficiency Retrofits	1
R2E3: Residential Retrofit Renewable Energy Incentives	1, 2, 3
R2E4: Warehouse Renewable Energy Incentive Program	1, 2, 3
R2E5: Solar Hot Water Incentives	2
R2E6: Residential Energy Efficiency for New Development	2
R2E7: Commercial Energy Efficiency for New Development	1
R2E8: New Home Renewable Energy	2
R2E9: New Commercial/Industrial Renewable Energy	2
R2E10: Commercial/Industrial Rehabilitation/Expansion Renewable Energy	2
R3E1: Green Building Development Facilitation and Streamlining	1, 2, 3
R3E2: Green Building Training	1, 2, 3
R3E3: Community Building Energy Efficiency & Conservation for Existing Buildings	1
R3E4: Energy Efficiency Financing	1, 2, 3
R3E5: Heat Island Mitigation Plan	2
R3 E6: Public Education	1, 2, 3
R3E7: Cross-Jurisdictional Coordination	1, 2, 3
R3E8: Community Alternative Energy Development Plan	2
R3E9: Support Utility-Scale Renewable Energy Siting and Transmission Lines	1, 2, 3
R3E10: Identify and Resolve Potential Barriers to Renewable Energy Deployment	1
R3E11: Solar Ready Buildings	2
R3E12: Renewable Energy Financing	2
R3E13: Regional Renewable Energy Collaboration	2
R3E14: Accessory Wind Energy Systems	2
R3E15: Off-Site Mitigation of GHG Impacts for New Development	1
Transportation	
R2T1: Anti-Idling Enforcement	1, 2, 3
R2T2: Employment Based Trip and VMT Reductions	1, 2, 3
R2T3: Revise Parking Policies	1
R2T4: Roadway Improvements including Signal Synchronization and Traffic Flow Management	1
R2T5: Expand Renewable Fuel/Low-Emission Vehicle Use	2, 3
R2T6: Ridesharing and Carpooling	1, 2, 3
R2T7: Bicycle/Pedestrian Infrastructure and Promotion	1, 2, 3

Emissions Reduction Measures	Phase
R2T8: Construct High Occupancy Vehicle (HOV) Lanes	1, 2, 3
R3T1: Public Transit Measures	1, 2, 3
R3T2: Leverage Existing Financing Mechanisms and Opportunities	1, 2, 3
R3T3: Diesel Exhaust Emissions Control Measures	1
R3T4: Regional Land Use/Transportation Coordination	1
R3T5: Regional Employment Based Trip Reduction Programs.	1
R3T6: County Commuter Services Program.	1
R3T7: Home Employment.	1
R3T8: Intelligent Transportation Systems Applications.	2
R3T9: Public Outreach and Educational Programs Relative to Various Modes of Transportation.	1
R3T10: Land Use Strategies to Reduce Reliance on Automobile Use	1
Waste	
R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	3
R2W2: Barstow Methane Recovery	1
R2W3: Landers Methane Recovery	2
R2W4: Comprehensive Disposal Site Diversion Program	1
R2W5: C&D Recycling Program	1
R2W6: County Diversion Program - 75 percent Goal	1, 2, 3
R2W7: City Diversion Programs - 75 percent Goal	1, 2, 3
R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP	3
R3W2: Leverage Existing Financing Mechanisms and Opportunities	1, 2, 3
R3W3: Waste Education Program	1, 2, 3
R3W4: Additional Landfill Methane Controls	1, 2, 3
R3W5: Landfill Gas to Energy Projects	3
Water	
R2WC1: Per Capita Water Use Reduction	1
R3WC2: Manage Storm Water Runoff	1, 2, 3
R3WC3: Conservation Areas	1, 2, 3
R3WC4: Financing Mechanisms and Opportunities	1, 2, 3
Natural Resources	
R3NR1: Conservation Areas	1, 2, 3
R3NR2: Compensation for Loss of Sequestration	2, 3
R3NR3: Urban Forestry	2, 3

Table 5-2: Anticipated Phasing of Internal GHG Reduction Measures

Emissions Reduction Measures	Phase
Building Energy	
R2E1-INT: LEED Silver for New County Buildings	1



Emissions Reduction Measures	Phase
R2E2-INT: Retrofit Existing Buildings	1,2,3
R2E3-INT: Increase Use of Combined Heat and Power Systems	2,3
R2E4-INT: Office Equipment Procurement Standard	1
R2E5-INT: Leasing Procurement Standards	1
R2E6-INT: Install solar and other renewable energy sources on County Buildings	1,2,3
R2E7-INT: HVAC Retrofit Program	1,2,3
R2E8-INT: Solar PV Installation Projects	2,3
R3E1-INT: Utilize Incentives Offered by Southern California Edison Partnership	1,2,3
R3E2-INT: Benchmark Existing Buildings	1
R3E3-INT: Link Utility Payment/Energy Usage Data into the Computer Aided Facilities Management Database	1
R3E4-INT: Train County Employees on Energy Efficiency and Conservation	1
R3E5-INT: Apply Energy Saving Design Features	1,2,3
R3E6-INT: Contracting Practices	1
R3E7-INT: Small Tools and Equipment Use	2
Transportation	
R2F1a-INT: Current fleet turnover	1,2,3
R2F1b-INT: Replace Passenger/Light-Duty Vehicles by 2020	1,2,3
R2F2-INT: Replace All Medium and Heavy-duty Vehicles by 2020	1,2,3
R3F1-INT: Implement Accelerated Vehicle Fleet Turnover for Other Vehicles	2,3
R3F2-INT: Use Hybrid/ULEV Vehicles	2,3
R3F3-INT: Implement Early Tire Inflation Program	1
R3F4-INT: Implement Anti-Idling Measures	1
R3F5-INT: Implement Smart Driving Policy	1
R3F6-INT: Implement Vehicle Maintenance Program	1
R3F7-INT: Senate Bill 375, Statutes 2008	2,3
R3F8-INT: California's Low-Emission Vehicle (LEV) Program	N/A (state)
R3F9-INT: Zero Emission Vehicle (LEV) Regulations	N/A (state)
R3F10-INT: Fleet and Equipment Management and Monitoring	1,2,3
Waste	
R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	3
R2W2: Barstow Methane Recovery	1
R2W3: Landers Methane Recovery	2
R2W4: Comprehensive Disposal Site Diversion Program	1
R2W5: C&D Recycling Program	1
R2W6: County Diversion Program - 75 percent Goal	1, 2, 3
R2W7: City Diversion Programs - 75 percent Goal	1, 2, 3
R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP (Optional)	3
R3W2: Leverage Existing Financing Mechanisms and Opportunities (Optional)	1, 2, 3
R3W3: Waste Education Program	1, 2, 3
R3W4: Additional Landfill Methane Controls (Optional)	1, 2, 3



Emissions Reduction Measures	Phase
R3W5: Landfill Gas to Energy Projects (Optional)	3
Employee Commute	
R2EC1-INT: Expand Vanpool Program	1
R2EC2-INT: Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving	1
R2EC3-INT: Increase Bicycling and Walking	1
R2EC4-INT: Increase the Use of Public Transit as an Alternative to Driving	2,3
R2EC5-INT: Increase Use of Clean Air Vehicles	2,3
R3EC1-INT: Telecommuting, compressed Work Week	2,3
Natural Resources	
R3CS1-INT: Tree Management	1,2,3
R3CS2-INT: Landscaping	1,2,3

GHG 5.4 PUBLIC INVOLVEMENT IN THE IMPLEMENTATION PROCESS

The citizens and businesses in the County are integral to the success of GHG reduction efforts. Their involvement is essential in order to reach the reduction goals because this Plan depends on a combination of state and local government efforts, public and private sources of finance, and the voluntary commitment, creativity, and participation of the community at large.

In August 2007, the Board of Supervisors launched Green County San Bernardino to spur the use of “green” technologies and building practices among residents, business owners, and developers in the County. Green County San Bernardino includes a public awareness component aimed at educating residents about steps they can take in their daily lives to conserve resources and protect the environment

The County will educate stakeholders such as businesses, business groups, residents, developers, and property owners about the Reduction Plan and encourage participation in efforts to reduce GHG emissions in all possible sectors.

GHG 5.5 REGIONAL COOPERATION

GHG 5.5.1 Green Valley Initiative

The Green Valley Initiative (GVI) envisions that the Inland Empire region will be a center of green technology with balanced economic and community development. Its mission is to transform Riverside and San Bernardino Counties into a region that integrates people and business with natural resources to create jobs, greater opportunities, and a higher quality of life. Regional organizations, the counties and cities, and businesses will work together to accomplish the goal of creating a healthy economic and environmental future.

San Bernardino and Riverside Counties initiated efforts in June 2007, and over 400 parties have participated in the development of recommendations for the GVI. The GVI is a project of the



Green Institute for Village Empowerment (GIVE), which seeks to empower, encourage, and promote principles of sustainability through education, training, and leading by example.

All San Bernardino County cities are invited to join the GVI by becoming a –Green Valley” jurisdiction. The County will encourage the incorporated cities to join the GVI, participate in the County’s GHG Reduction Plan, and develop their own climate action plans to reduce GHG emissions. To join GVI, cities will need to adopt the GVI resolution, declaring their participation in GVI and commitment to a higher quality of life through the implementation of sustainable policies that promote responsible economic and community development.

Green Valley Cities must pledge to address five (5) or more policy areas that aim to reduce GHG emissions. Cities have complete discretion over which policies they choose to adopt. GVI recognizes that each city is unique and a one-size-fits-all approach is counteractive to the overall goal of sustainable economic and community development.

Participants joining the GVI will document their participation by resolution or letter, identify a Green Valley coordinator, and pledge to address a minimum of five (5) of the listed policy areas shown below, as they are developed:

- Green Building Programs
- Buy Green/Buy Local
- Green Business Programs
- Conservation and Recycling
- Solar and Alternative Energy
- Encourage Green Economic Development
- Green Valley Land Use
- Green Valley Coordinators

San Bernardino County cities that have already joined GVI include Adelanto, Chino, Fontana, Loma Linda, Rancho Cucamonga, Rialto, Redlands, the Town of Yucca Valley, and Yucaipa. Other participants include Cucamonga Valley Water District, the Western Riverside Council of Governments, the Eastern and Western Municipal Water Districts, the Cherry Valley Water District, the March Air Force Base JPA, the County of Riverside, Beaumont, Coachella, Canyon Lake, Cathedral City, Corona, Desert Hot Springs, Indian Wells, La Quinta, and Riverside. GVI and its partners hope to have more agencies join them in their quest to transform the Inland Empire into the –green valley.”

GHG 5.5.2 Other Regional Cooperation Opportunities

There are other substantial opportunities for regional collaboration that will be essential to implementation of this Reduction Plan. These opportunities include, but are by no means limited to the following:

- *Energy Efficiency.* There may be opportunities for regional energy efficiency



programs that can reduce program implementation and administration costs and that could leverage combined sources of financing to the benefit of the County and the San Bernardino cities.

- *Alternative Energy.* There may be opportunities for cross-jurisdictional cooperation on community-scale alternative energy installations (wind, solar, etc.).
- *Land Use and Transportation.* The County already coordinates with the San Bernardino cities in planning for their spheres of influence, and works with regional transportation planning agencies and providers. In order to fully implement General Plan policies promoting transit and mixed use development, continued coordination will be necessary to promote transit-oriented development throughout the region by supporting transit funding and development, by promoting adequate densities to support transit in those portions of the County where it is feasible, and to coordinate land use planning with the cities. With SB 375 and its linkage to transportation funding, it will be crucial for the San Bernardino cities and the County to develop a shared vision of how land use and transportation can be consistent with the next Regional Transportation Plan and the required Sustainable Communities Strategy.
- *Waste/Landfills.* As described above and in Appendix A, this Plan includes the adoption of a 75 percent diversion goal by the cities in San Bernardino in addition to County adoption of such a goal. The County and the cities need to coordinate to provide the facilities, programs, and incentives so that these goals could be achieved by 2020 and to avoid inefficiencies in implementation
- *Water.* While the County can continue to influence water efficiency through requirements for new development, as well as cooperation with water purveyors to promote conservation in indoor and outdoor water use from existing developments.

GHG 5.6 DEVELOPMENT PROJECT REVIEW

The County will establish procedures to implement the Development Review Process (DRP) for evaluating new projects (as defined by CEQA) in the County's LUA area for consistency with this Plan, CEQA guidelines, and any applicable state, regional and local plans to reduce GHG emissions. The CEQA Guidelines encourages programmatic GHG mitigation strategies including reliance on adopted regional blueprint plans, GHG reduction plans, and general plans that meet regional and local GHG emissions targets and that have also undergone CEQA review. The County, as lead agency, determines significance of a project's generation of GHG emissions and has the authority to make this determination based upon a project's compliance with this Plan.

An important administrative objective of the County in adopting a GHG Plan is that it satisfies the requirements of Section 15183.5 of the CEQA Guidelines, which sets forth standards for using a greenhouse gas reduction plan to address the GHG emissions of specific projects. Under this Guideline, compliance with the GHG Plan can be used in appropriate situations to determine the significance of a project's effects relating to greenhouse gas emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG Plan.



Guideline section 15183.5(b) reads as follows:

(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:

- (A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;*
 - (B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;*
 - (C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;*
 - (D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;*
 - (E) Establish a mechanism to monitor the plan's progress towards achieving the level and to require amendment if the plan is not achieving specified levels;*
 - (F) Be adopted in a public process following environmental review.*
- (2) Use the Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulative considerable, notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.*

The provisions of the GHG Plan and the appendices that support the Plan comply with these



provisions by providing a quantified inventory of currently existing and projected greenhouse gas emissions resulting from activities within a defined geographic area of the County. The GHG Plan and associated documents also identify and analyze the emissions associated with specific actions, and set forth performance standards to achieve the specified emissions goals. The GHG Plan establishes a GHG emissions reduction target for 2020 of 15% below 2007 emissions, consistent with AB 32 and sets the County on a path to achieve more substantial long term reduction in the post-2020 period. Achieving this level of emissions will ensure that the contribution to greenhouse gas emissions from activities covered by the GHG Plan will not be cumulatively considerable. The analysis in the GHG Plan and the supporting documents demonstrates that this level will be achieved by the identified mitigation measures. The Plan also includes requirements to monitor progress towards achieving the specified emissions goals, and provisions for amendment of the Plan if it is not making sufficient progress towards reaching those goals. Finally, the GHG Plan, including monitoring, will be adopted in a public process following environmental review.

Screening Tables, in the form presented in Appendix F, will serve as a tool to assist with implementing applicable mitigation based on calculated GHG reduction and aid in the determination of a significance finding. The Screening Tables incorporate a point system that is based on calculated emission reductions for various GHG mitigation using accepted emission factors. The point system is designed to ensure compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those from existing development, will allow the County to meet its GHG emissions reduction target. Consistent with the CEQA Guidelines Sections 15064(h)(3) and 15064.4, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions.

Projects that do not use the Screening Tables, will be required to quantify project specific GHG emissions or otherwise demonstrate that project specific GHG emissions will be consistent with the reduction measures in the GHG Plan and achieve the equivalent level of GHG emissions efficiency as a 100-point project, which will allow the County to achieve the GHG reduction targets in the GHG Plan. Consistent with the CEQA Guidelines, projects that can demonstrate this level of reduction or greater will be determined to have a less than significant individual and cumulative impact for GHG emissions. In some cases, projects may not be able to achieve sufficient reductions in GHG emissions (identified through the use of the Screening Tables or through project-specific quantification), thus resulting in a preliminary determination of a significant impact on GHG emissions that will require preparation of an EIR to analyze the project's impacts and possible mitigation.

Monitoring of Plan implementation in order to track progress, to determine whether emissions are being reduced as forecasted, and to provide a platform for future revisions to the plan, if necessary, is a critical activity. In order to retain the benefits of CEQA streamlining and tiering of the analysis of greenhouse gas emissions for future projects as described in the CEQA Guidelines Section 15183.5 above, the Plan must include a mechanism to monitor the plan's progress towards achieving the level of proposed emissions reductions and to require amendment if the plan is not achieving specified levels. Monitoring is more fully described in section GHG 5.7



below and the process for amending the Plan is described in section GHG 5.9.

Consequently, the County, through CEQA and the County Development Code, will ensure that new development within the County's LUA area meets the requirements set forth in this Plan. This Plan represents a local plan to reduce GHG emissions 15% below 2007 emissions by 2020 consistent with AB 32, and constitutes an "adopted list of regulations and requirements to implement a local plan" as specified in the CEQA Guidelines. Furthermore, the Plan contains an analysis that extends beyond 2020 to 2030 with consideration of the trajectory of reductions needed to provide substantial reductions by 2050 (see Appendix E), consistent with CARB's recommendations for looking forward in its Scoping Plan.

The Plan does not allow larger residential or mixed-use projects outside a City Sphere of Influence (SOI) to use the Screening Tables or rely on this Plan for a determination that the project's individual or cumulative GHG impacts are less than significant. This provision ensures land use commitments outside of SOIs do not impede the expected emissions trajectory to mid-century and are not likely to conflict with the long term goal of substantial reductions through 2050. This provision is an interim procedure that will be re-examined in a major Plan update and amendment anticipated to occur in 2015 following a new emissions inventory and incorporation of the SCS and Regional GHG reduction measures.

Residential projects (or mixed use projects with a residential component) that exceed 250 residential units that are located in unincorporated areas not within a City SOI will not be eligible to use the Screening Tables or rely on this Plan for a determination of less than significant on individual or cumulative GHG impacts. (See Appendix F for a full description of the limitations and uses of the Screening Table.)

Residential Projects outside of a City SOI that exceed 250 residential units will be required to prepare a project specific GHG emissions analysis that includes a robust assessment of emissions, appropriate mitigation measures, and analysis of the issues associated with land use intensification and VMT generation on a project and regional basis. The analysis must produce an assessment that allows for a determination of whether the specific project causes cumulatively considerable GHG impacts. These projects will not qualify for the tiering and streamlining benefits otherwise provided by this Plan as allowed by CEQA Guidelines Section 15183.5 due to the inability to adequately analyze and incorporate programmatic mitigation that comprehensively addresses the issues of GHG emissions for regionally significant residential projects beyond the 2020 analysis horizon.

It is anticipated that upon completion of the Sustainable Communities Strategy (SCS) by Southern California Association of Governments (SCAG) and the Regional GHG Reduction Plan currently under preparation by the San Bernardino County Association of Governments (SANBAG), adequate methodology for quantification of regional VMT and more comprehensive mitigation will provide suitable planning tools that can be incorporated into this Plan through a future amendment. Both the SCS and the Regional GHG Reduction Plan are intended to satisfy the requirements of SB 375 and allow better forecasts of GHG emissions for future years as well as providing a regional strategy for reducing GHG emissions.



GHG 5.7 MONITORING AND INVENTORYING AND REPORTING

The GRT will establish a process of monitoring the implementation of the GHG Reduction Plan and amending the plan as opportunities arise. The Land Use Services Department (LUSD) will compile the monitoring results and report to the Board of Supervisors on Plan implementation progress. The LUSD will incorporate annual monitoring results with the required annual reporting procedures for implementation of the County General Plan. The County will conduct periodic comprehensive reviews on a four year schedule that will involve an appropriate level of re-inventorying emissions sources in order to get a more complete understanding of GHG conditions at that time and the results of the GHG Emissions Reduction program. (See Section GHG 5.3) A four year interval for “re-inventorying” will be synchronized with the reduction measure phasing. Phases 1 and 2 will be concluded in 2014 and thus, re-inventorying (the inventory will be completed in 2015) at this point will provide an important milestone assessment in the progress that the County is making with Plan implementation. The next inventory would be completed to coincide with the 2020 target date and implementation of the Phase 3 reduction measures. This inventory will provide a more comprehensive assessment of the Plan’s success while providing a basis for adjusting the Plan for the 2030 target. As the GHG Plan is implemented and as technology changes, for example, energy consumption, vehicle efficiency, waste diversion amounts, and methane recovery amounts will change. If promising new strategies emerge, the County will evaluate how to incorporate these strategies into the GHG Reduction Plan. Further, state and federal action will also result in changes which will influence the level of the County emissions.

Monitoring the Development Review Process: As noted in Section GHG 5.6 above, monitoring of Plan implementation in order to track progress, to determine whether emissions are being reduced as forecasted, and to provide a platform for future revisions to the plan, if necessary, is essential to retain the benefits of CEQA streamlining and tiering of the analysis of greenhouse gas emissions as described in the CEQA Guidelines Section 15183.5. The LUSD will use development permit tracking to monitor and evaluate the utility and effectiveness of the Screening Tables as the tables are applied to new development permits. Use of the Screening Tables will facilitate calculation of project GHG emissions, with and without mitigation. The quantified emissions can be recorded and tracked with the County’s permit tracking software. As part of the Department’s annual monitoring review an assessment will be made as to the function of the Screening Tables and the effectiveness of mitigation. Recommendations for changes to the DRP process will be made by the Department Director and approved by the CEO. These changes will be part of the amendment process for the GHG Emissions Reduction Plan described in section GHG 5.9.

GHG 5.8 ADDITIONAL PLANNING ACTIVITIES

GHG 5.8.1 Addressing SB 375

Senate Bill 375 (SB 375) (codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.01, 65584.04, 65584.04, 65587, 65588, 14522.1, 14522.2, 65080.01 and Public



Resources Code Sections 21061.3, 21159.28, and Chapter 4.2), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. For the southern California region, the Southern California Association of Governments (SCAG) is the MPO responsible for preparing the SCS.

One of the challenges in addressing the reduction of GHG emissions in response to SB 375 is the regional interconnectedness of various emission sources. On road transportation emissions are particularly hard to reduce because of that regional interconnectedness. Most of the vehicle trips and vehicle miles traveled within Unincorporated San Bernardino County originate and/or terminate in the cities within the County. To address this issue and provide additional GHG reduction opportunities, the County proposed to the San Bernardino County Association of Governments (SANBAG) that a collaborative regional effort in reducing GHG emissions be undertaken. The proposal was to collaborate with the cities within the County, SANBAG and SCAG in addressing regional sources of GHG emissions. The result is the SANBAG Regional GHG Reduction Plan. One aspect of the SANBAG Regional GHG Reduction Plan is the regional traffic modeling effort being coordinated with SCAG in the demonstration of sustainable community strategies (SCS) for the region. The regional traffic modeling effort includes all of San Bernardino Valley as well as the Victor Valley area of the High Desert region of San Bernardino County.

The regional collaborative approach to analyzing and reducing on road transportation related emissions provides quantification of GHG reductions due to County land use policies focusing land use development and increased densities within the cities' spheres of influence (SOI) that was not possible during the drafting of the San Bernardino County GHG Reduction Plan. In addition, this regional approach allows for quantification of reductions associated with transit oriented development (TOD) and mixed land use intensification along transit lines within the cities and proposed transit lines in the unincorporated areas of the County (see GHG Reduction Measure R3T4); regional employment based trip reduction programs (see GHG Reduction Measure R3T5); Intelligent Transportation Systems (ITS) applications (see GHG Reduction Measure R3T8); and others.



The SANBAG Regional GHG Reduction Plan will be able to quantify many of the R3 measures in the San Bernardino County GHG Reduction Plan that were unquantifiable at the time the San Bernardino County Plan was drafted. Once on road transportation reductions are quantified in the SANBAG Regional GHG Reduction Plan, additional reduction quantification will be possible as an update to the San Bernardino County GHG Reduction Plan.

Additionally, the SANBAG regional effort looks past 2020 toward achieving the 2035 reduction target in SB 375, which will yield additional on road transportation reduction quantification related to our region's portion of the SCAG SCS. The SCS for SCAG is anticipated to be adopted in March 2012. The SANBAG Regional GHG Reduction Plan is proposed to be adopted this fall, in 2011. However, the draft SCS will be out in September 2011. The SANBAG Regional GHG Reduction Plan will include elements of the SCS that pertain to our region through coordination with SCAG even though the SANBAG Plan precedes the adoption of that SCS strategy. Both regional programs will provide protocols and mitigation measures that will be needed to fully implement GHG Reduction Measure R3T10 (Land Use Strategies to Reduce Reliance on Automobile Use).

The County anticipates that both the SCAG SCS and SANBAG Regional GHG Reduction Plan will have implications for land use and land use designations in the unincorporated area of San Bernardino County under the County's LUA. The SANBAG GHG Plan is expected to focus on VMT reduction and travel scheduling, while the SCS is anticipated to emphasize Smart Growth concepts such transit oriented development, compact development, mixed use development that positions residential land uses closer to job centers, and walkable community design. While the current County General Plan embraces all of these smart growth principles and aspirations for VMT reduction, the land use designations may require substantial analysis and modification to affect the GHG reduction strategies that may emerge from the SANBAG GHG Plan. Land use designations and zoning changes were not part of the 2007 General Plan Update, however, they will likely need to be re-assessed in the next update to respond to the SCAG and SANBAG programs. When the regional strategies are completed by SCAG and SANBAG, the County will engage in re-evaluating the County General Plan from a land use standpoint with focused consideration of its implications for amending the GHG Plan. The County believes that from a cost-effective and efficiency perspective, a land use analysis and prospective GHG Plan amendment to include the regional strategies should occur in conjunction with the first emissions re-inventorying effort to be completed within four years of Plan adoption provided the regional strategies have been finalized and adopted by the time of that first emissions re-inventory.

GHG 5.8.2 Beyond 2020

In order to assess whether implementing this plan achieves the State's long-term climate goals, one must look beyond 2020 to see whether the emissions reduction measures set the County on a trajectory needed to comply with State mandates. Governor Schwarzenegger's Executive Order



S-3-05 calls for an 80 percent reduction below 1990 GHG emissions levels by 2050. This results in a 2050 statewide target of about 85 MMTCO₂e (total emissions), as compared to the 1990 level (also the 2020 target) of 427 MMTCO₂e. Assuming that San Bernardino County's 2020 goal of 15% below 2007 levels (approximately 5.3 MMTCO₂e, for External Emissions and 0.3 MMTCO₂e for Internal Emissions) is roughly equivalent to 1990 levels, the 2050 County goal to match the S-3-05 goals would be approximately 1 MMTCO₂e in 2050.

Full implementation of CARB's Scoping Plan and the County's GHG Reduction Plan will put the County on a path toward these required long-term reductions. Figure E-1, Appendix E, depicts what an emissions trajectory might look like; assuming San Bernardino County follows a linear path from the 2020 reduction target to a 2050 goal matching that in S-03-05. While the measures needed to meet the 2050 goal are too far in the future to define in detail, one can examine the policies needed to keep us on track through at least 2030.

To stay on course toward the 2050 target, the County's greenhouse gas emissions need to be reduced to approximately 3.9 MMTCO₂e by 2030. This translates to an average reduction of 2.7 percent per year between 2020 and 2030. An additional challenge comes from the fact that the population in unincorporated San Bernardino County will grow further between 2020 and 2030.

To counteract this trend, per-capita emissions must decrease at an average rate of slightly less than 3.1 percent per year during the 2020 to 2030 period. These reductions are possible. The measures needed are logical expansions of the programs recommended in the CARB Scoping Plan at the state level and the measures included in the San Bernardino GHG Reduction Plan at the local level that get the County to the 2020 goal.

As described above under the discussion of GHG Reduction Goals, 2020 is only a milestone in GHG reduction planning. Executive Order S-03-05 calls for a reduction of GHG emissions to a level 80 percent below 1990 levels by 2050. The 2050 target is consistent with the estimated reductions needed to stabilize atmospheric levels of CO₂ at 450 parts per million (ppm). Thus, there will be a need to start planning ahead for the post-2020 period. The County will commence planning for the post-2020 period starting in 2017, at the approximate midway point between plan implementation and the reduction target and after development of key ordinances and implementation of cost-effective measures. At that point, the County will have implemented the first two phases of this GHG Plan and will have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. Further, the state's regulations under AB 32 would have been fully in force since 2012; federal programs and policies for the near term are likely to be well underway; market mechanisms like a cap and trade system are likely to be in force and will be influencing energy and fuel prices; and continuing technological change in the fields of energy efficiency, alternative energy generation, vehicles, fuels, methane capture, and other areas will have occurred. The County will then be able to take the local, regional, state, and federal context into account. Further, starting in 2017 will allow for development of the post-



2020 plan so that it can be ready for full implementation, including potential new policies, revisions to the General Plan (as necessary), programs, ordinances, and financing by 2020.

The new plan will include a specific target for GHG reductions for 2030, 2040, and 2050. The targets will be consistent with broader state and federal reduction targets and with the scientific understanding of the needed reductions by 2050. The County will target adoption of the new plan by January 1, 2020.

GHG 5.9 Amending the GHG Plan

The GHG Emissions Reduction Plan is viewed by the County as a dynamic program that requires implementation, monitoring, evaluation and adaptation. A critical provision of any dynamic program anticipates amendments that will result in adaptation based on the experience gained from the evaluation of implementation and monitoring. The County GHG Plan will be amended as needed to achieve the 2020 reduction target of 15% below 2007 emission levels and to incorporate future reduction strategies, such as those that are anticipated to result from regional scale reduction planning required by SB 375. Amendments will also be necessary to incorporate new or improved methodologies and protocols for measuring emission generation and mitigation reductions. The County anticipates that both major and minor amendments will be needed as Plan implementation progresses over time. Major amendments will require review by the County GRT (GHG Reduction Team), Planning Commission and adoption by the Board of Supervisors. Minor amendments can be accomplished upon review and recommendation by the GRT and approval by the CEO.

The GHG model for the County GHG Plan forecasts that GHG emissions in the jurisdictional area addressed in this Plan will be reduced by 260,692 metric tons of carbon dioxide equivalent (MTCO₂e) for the Internal Inventory and 2,290,874 metric tons of carbon dioxide equivalent (MTCO₂e) for the External Inventory compared to the unmitigated projections in 2020. Based on comprehensive updates to the GHG inventory, the County will evaluate whether the actual GHG emissions from activities over which the County has jurisdictional and operational control reflect the reductions anticipated by the model. If sufficient reductions are not achieved by the 2015 re-inventory, the County will reevaluate and adjust the measures and overall targets to reach the established 2020 target. A second re-inventory is planned to coincide with an evaluation in 2020 as to Plan success. A second major amendment may be necessary at this point to ensure that emission reductions are on track to maintain a trajectory post 2020, to provide substantial reductions by 2050.

Minor Amendments are anticipated as part of the Department's annual monitoring review of the Development Review Process (DRP). An assessment will be made as to the function of the Screening Table and the effectiveness of mitigation. Recommendations for changes to the DRP process will be made by the Department Director, reviewed by the GRT and approved by the



CEO.

Major Amendments will be more comprehensive and are anticipated to occur in conjunction with the four year interval for re-inventorying that will be synchronized with the reduction measure phasing. At a minimum, two major amendments are anticipated to be required between the date of Plan adoption and 2020. Implementation Phases 1 and 2 (described in section GHG 5.3) will be concluded in 2014 with re-inventorying completed in 2015. At this point, an important milestone assessment in the progress that the County is making with Plan implementation will occur. By this time, regional emissions reduction strategies resulting from SB 375 should be completed. Results from monitoring, re-inventorying and new regional reduction strategies will provide the appropriate data for a comprehensive amendment in.

The next inventory is intended to be completed at a point that coincides with the 2020 target date and implementation of the Phase 3 reduction measures. This inventory will provide a more comprehensive assessment of the Plan's success while providing a basis for adjusting the Plan for the 2035 target.

Technical Appendices

INTRODUCTION TO APPENDICES

Prepared By:

ICF INTERNATIONAL

Inventories

Two separate Green House Gas (GHG) inventories were prepared by ICF International for the County and are presented in this GHG Reduction Plan (the ~~Plan~~ or ~~GHG Reduction Plan~~): the External Inventory and the Internal Inventory. These inventories are defined below.

External Inventory

The External Inventory includes GHG emissions from land uses within the County's unincorporated areas where the County has jurisdictional land use authority (External Inventory). The External inventory also includes emissions generated outside the County that are the result of service and operation demands from land uses located within the County's unincorporated area.

For purposes of this Plan, the jurisdictional area subject to the County's land use authority (LUA) is the area within which the County exercises discretionary development permit and ministerial building permit authority.

The year 2007 was chosen for the current External Inventory as it was the most recent year with the necessary data to perform a comprehensive inventory (~~Current~~ or ~~2007~~ inventory). The 2020 emissions projection represents unmitigated emissions associated with the County's LUA in 2020.¹

Internal Inventory

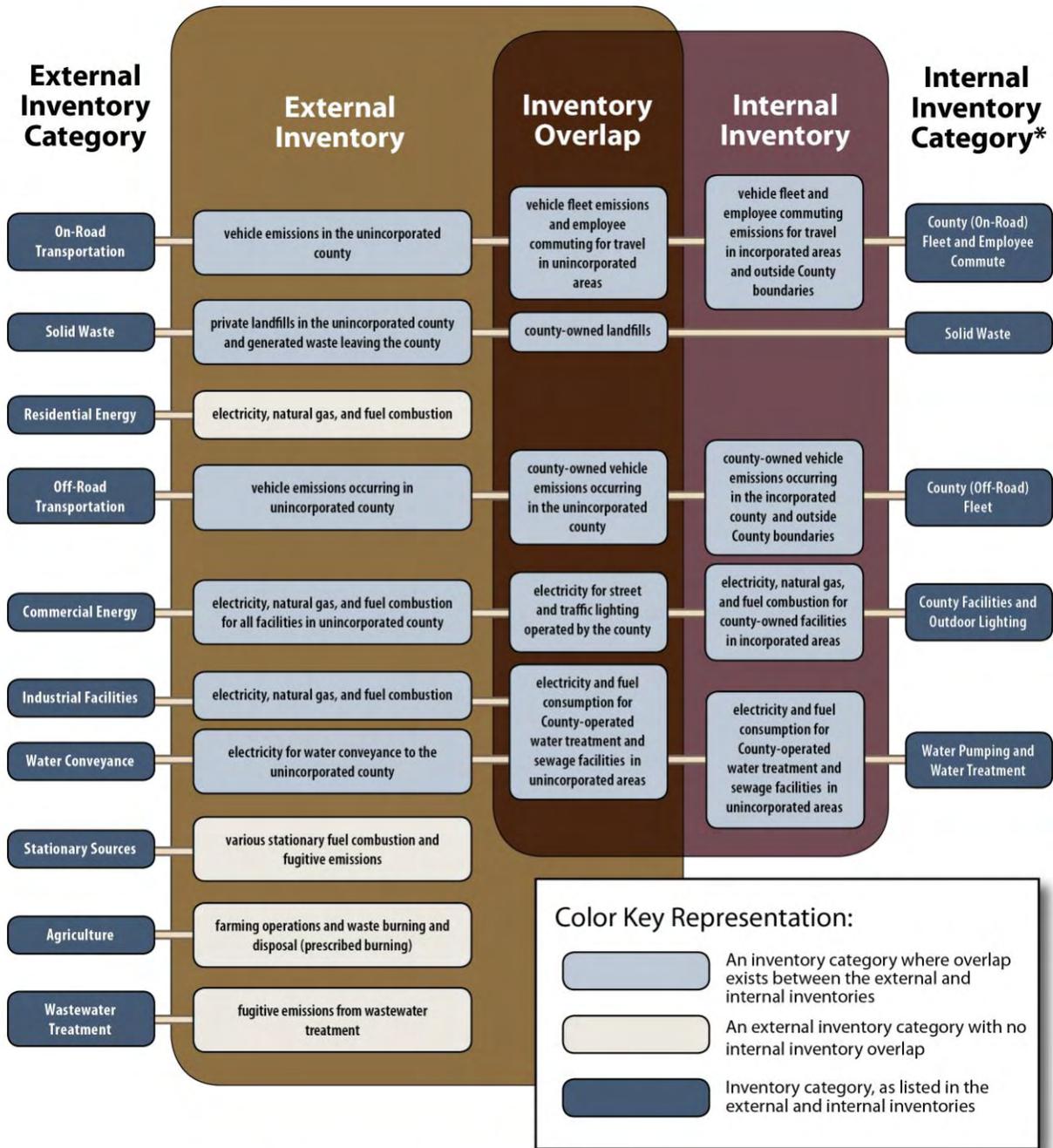
The Internal Inventory includes GHG emissions associated with the County's provisions of services and internal operations. The Internal Inventory includes emissions that occur due to County operations within the unincorporated County (where County facilities and operations are located and/or take place in unincorporated County (where County facilities and operations that occur outside the unincorporated County (where County facilities and operations are located and/or take place in other jurisdictions).

¹ This is sometimes referred to as 2020 ~~Business as Usual~~ or BAU emissions. This report uses the term ~~unmitigated emissions~~ for future emissions forecasts that do not take into account state, regional, or local emission reduction measures.

The County's current Internal Inventory is for the fiscal year (FY) 06/07 (July 1, 2006, to June 30, 2007), which represents the most recent year with the necessary data to perform a comprehensive inventory ("Current" or "2007" inventory). The 2020 emissions projection represents unmitigated emissions associated with the County's internal operations in 2020.

Some emissions sources are included in both External and Internal Inventories, as there are overlaps in the operational boundaries of the two (2) inventories. For example, in the External Inventory, on-road transportation emissions include emissions from all vehicles travelling in the unincorporated County, as calculated with the California Air Resources Board's (CARB) On-Road Emissions Factor (EMFAC) model. The corresponding Internal Inventory category is County vehicle fleet emissions, which operate in the unincorporated County, incorporated County, and outside of the County. The overlap between the External and Internal Inventories for this category are those County vehicle emissions that occur in the unincorporated County since these emissions are accounted for in the EMFAC modeling.

Figure 1: GHG Emission Source Overlap for the External and Internal County Inventories



*Several of the Internal Inventory categories are combined.

Figure 1 shows the “overlap” between inventory categories in the External and Internal Inventories for San Bernardino County. The general categories included in the External Inventory are shown on the left-hand side of the diagram; the general categories included in the Internal Inventory are shown on the right-hand side of the diagram. Where there is overlap of a particular External Inventory category with an Internal Inventory category (“Inventory Overlap”), the particular External Inventory category is linked to the appropriate Internal Inventory category. The “Inventory Overlap,” depicted in the area shaded dark brown, represents those portions of the External and Internal inventories where there is an overlap between inventory categories.

Reduction Measures

The emission reduction measures included in this Plan include existing and proposed federal, state, regional, county, and other local measures that will result in GHG emissions reductions of those emissions inventoried in both the External and Internal Inventories. The emission reduction measures are organized as follows, for each emissions sector:

- *Reduction Classification 1 (R1)* includes all adopted, implemented, and proposed state, and regional measures that will result in quantifiable GHG reductions for the County’s LUA area and internal operations.² These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.
- *Reduction Classification 2 (R2)* includes all quantifiable measures that have been or that will be implemented by the County, as well as any additional quantifiable measures that require County action and could further reduce the GHG emissions for the County’s LUA area and internal operations. R2 also includes any federal, state, and regional measures that require substantial action by the County to achieve the expected GHG reductions.
- *Reduction Classification 3 (R3)* includes all other measures that have been implemented or that will be implemented by the County which were not quantified, but are included in the County’s GHG Plan. These measures are either facilitative in nature or there are methodological issues that prevent their quantification at this time.

Appendices A and B include a detailed discussion of the methodology applied for each reduction measure for the External and Internal GHG Reduction Plan. The reduction methodology for R1, R2, and R3 measures is summarized below:

- R1 measures were primarily quantified consistent with the CARB methodology outlined in the AB 32 Scoping Plan. In the AB 32 Scoping Plan, CARB quantified reductions associated with each measure identified in the Scoping Plan. The percent reduction associated with each of the AB32 Scoping Plan measures was directly applied to the County’s GHG Reduction Plan measures. For example, the AB 32 Scoping Plan states that Pavley I and II will result in a 20 percent reduction in statewide passenger/light duty emissions by 2020. Consequently, a 20 percent reduction in 2020 passenger/light duty external emissions was attributed to the GHG Reduction Plan measures. R2 measures were

² Includes County buildings located in cities (incorporated areas) which are included in the Internal inventory but not in the External inventory.

quantified on a case-by-case basis, based on available information as well as other protocols and studies. To avoid double counting reductions from R1 measures, reductions from R2 measures incorporate relevant R1 measures and preceding R2 measures. For example, R2T3 (Congestion Pricing and Driving Disincentives) applies to external on-road emissions after all R1 transportation measures, as well as measures R2T1 and R2T2, have been addressed. The R2 measures presented in this Plan are consistent with the County's General Plan; a cross-reference of the proposed measures to General Plan policies is provided in Appendix C.

- R3 measures were not quantified and were not used to demonstrate achievement of the County's 2020 GHG emissions reduction target. Some of these measures (such as education or financing strategies) are necessary to facilitate success of R2 measures and are considered essential parts of this Plan. Other measures may contribute to additional GHG reductions, but lack data or protocols for quantification, and are not necessary to reach the identified 2020 reduction target. These measures may be suitable for quantification in the future subject to further research on viability or development of suitable data or protocols.

Reduction Target

The County's reduction target, of 15 percent below Current levels, is based on AB 32 and CARB's recommended greenhouse gas reduction goal for local governments of 15 percent today's level's by 2020, to ensure that their municipal and community-wide emissions match the State's reduction target. (AB 32 Scoping Plan 2008, p. ES-5).

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APPENDIX A

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APPENDIX A - External Inventory/Reduction Measures Methodology

Prepared By:

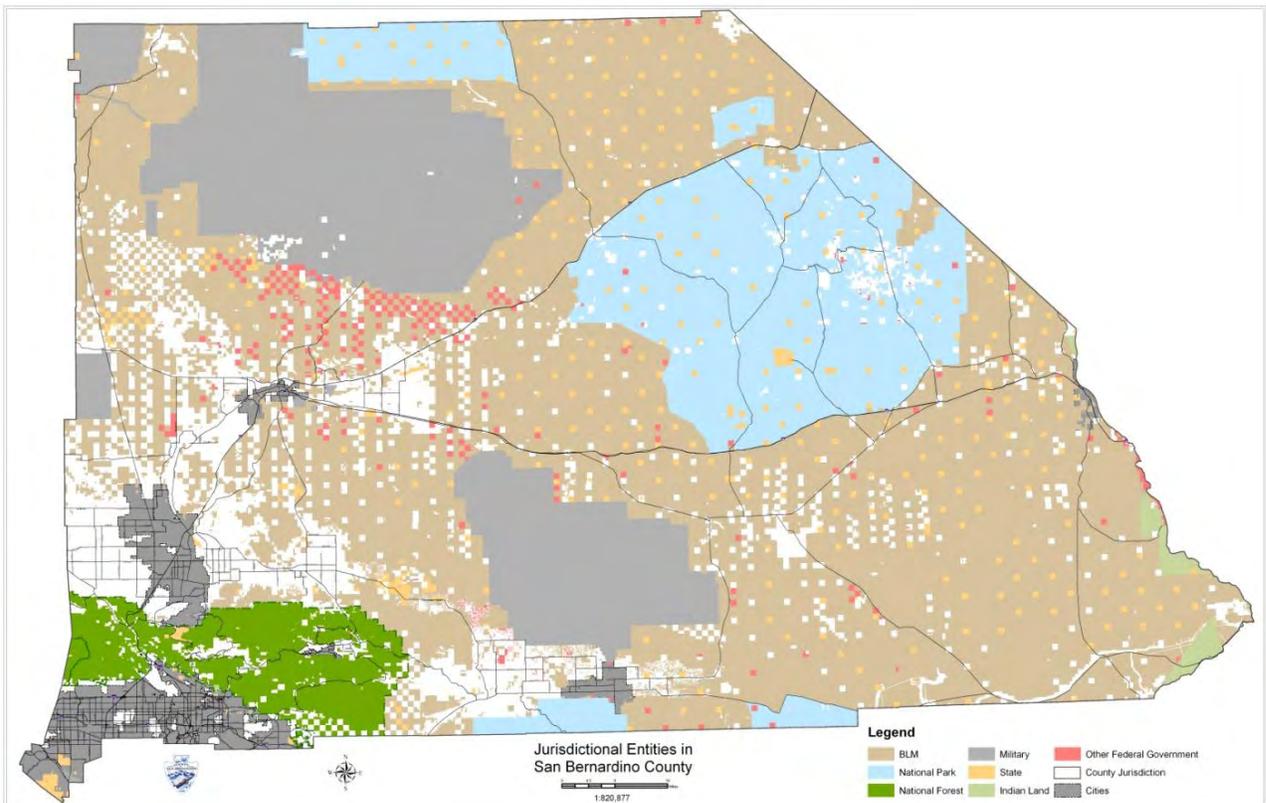
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Jurisdictional Authority	A-10
Methodology for External Inventory Emissions, Calculation and Data Collection	A-11
Calculation Approach	A-13
South Coast Air Quality Management District Inventory	A-14
2020 Unmitigated Emissions Projections	A-15
External Inventory	A-17
Building Energy End Use Emissions	A-17
Transportation and Land Use Emissions	A-22
Stationary Source Emissions	A-24
Water Conveyance Embodied Emissions (Imported Water)	A-27
Landfill Emissions	A-28
Fugitive Emissions from Wastewater Treatment	A-31
Agriculture	A-33
Miscellaneous	A-34
Carbon Sinks and Sequestration	A-35
External Inventory Results Summary	A-37
Scope 3 External Emissions	A-43
Data Gap Analysis and Recommendations for Future Inventories	A-46
Methodology for Estimating External Reduction Measures GHG Effectiveness	A-48
Introduction	A-48
Development Review Process	A-48
Building Energy Reduction Measures	A-50
Transportation and Land Use Measures	A-69
Municipal Solid Waste Management	A-85
Stationary Source Measures	A-96
Agriculture	A-101
Water Conservation Measures	A-103
Wastewater Treatment	A-109
Natural Resource Conservation	A-110
List of Preparers	A-112
ICF International	A-112
San Bernardino County	A-112
References	A-113
Personal Communications	A-116

Jurisdictional Authority

Figure A-1 depicts the incorporated and unincorporated portions of the County, as well as federal and state lands within the County

Figure A-1: Jurisdictional Entities in San Bernardino County



The County regulates land use within the unincorporated portion of the County but does not regulate projects within the boundaries of the incorporated cities, state and federal lands, such as those lands managed by the Bureau of Land Management (BLM), military bases and installations. Additionally, public utilities, water agencies (other than private water agencies), and railroads are generally not subject to the County’s land use jurisdiction.

Methodology for External Inventory Emissions, Calculation and Data Collection

This section provides information, the methodology, and supporting material relating to calculations of greenhouse gas (GHG) emissions for the San Bernardino County (County) External Inventory, and data collection efforts. Emissions were calculated in terms of metric tons carbon dioxide equivalent (MTCO_{2e}).

The guidelines of the Local Government Operations Protocol (LGOP) (CARB et al. 2008) were followed in developing this inventory, although the LGOP does not specifically establish a community emissions protocol appropriate to this inventory. In cases, where the LGOP did not establish specific guidance, the inventory follows protocol from the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006), the U.S. Environmental Protection Agency (USEPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007 (2007, 2008, 2009a, 2009b), and the California Climate Action Registry's General Reporting Protocol (2009b). These documents include standard and widely accepted inventory methodology and guidance.

The External Inventory includes the years 2007 and 2020. The year 2007 (referred to as the "2007" inventory, or "Current" year inventory for the External Inventory) was chosen for the External Inventory as it was the most recent year with the necessary data to perform a comprehensive inventory. The 2020 inventory is an unmitigated projection based on current energy consumption and unit emission rates adjusted by sector-specific growth rates provided by the County or based on CARB's unmitigated projections for 2020 (CARB 2009).

Table A-1 presents the emissions sectors included in the External Inventory, the data source for each emission sector, the methodology for scaling countywide emissions to the County's LUA area where appropriate, and the methodology for projecting emissions to 2020.

Table A-1. External Inventory Data Sources and Methodology

Sector	Emission Sources	Source of Data	Scaling Methodology	Projection Methodology
Stationary Sources	Cement plant process emissions	SCAQMD	Population ¹	SCAQMD growth factors
	Fuel combustion	CARB mandatory reporting data		
	Industrial process emissions			
Residential	Electricity consumption	Electricity records from utilities ²	None	County growth forecasts ⁴
	Natural gas consumption	Gas records from utilities ³		
	Other fuel consumption by type (LPG, fuel oil, diesel, gasoline, etc.)	County Assessor data		
Commercial	Electricity consumption	Electricity records from utilities ²	None	County growth forecasts ³
	Natural gas consumption	Gas records from utilities ³		
	Other fuel consumption by type (natural gas, LPG, fuel oil, diesel, gasoline, etc.)	County Assessor data		
Industrial	Electricity consumption	Electricity records from utilities ²	None	County growth forecasts ³
	Natural gas consumption	Gas records from utilities ³		
	Other fuel consumption by type (natural gas, digester gas, LPG, fuel oil, landfill gas and diesel)	County Assessor data		
Transportation (on- and off-road)	On-road vehicles fuel combustion	SCAQMD	Population	SCAQMD growth factors
	Off-road vehicles and equipment fuel combustion			
Agricultural Emissions	Enteric fermentation and manure management from dairy operations	SCAQMD	Population	SCAQMD growth factors
Landfill Waste	Methane emissions from landfilled waste	County SWMD CIWMB USEPA Landfill Methane Outreach Program (LMOP) database.	None	County SWMD projections
Domestic Wastewater Treatment and Discharge	CH ₄ and N ₂ O emissions from the treatment of wastewater from domestic sources (municipal sewage)	CARB California GHG inventory	None	General Plan growth forecasts ⁵
Water Conveyance	Indirect electricity emissions for water supply and irrigation infrastructure	CEC	None	General Plan growth forecasts ⁴

¹ No scaling factor was used for cement plants.

² Electric utilities include Southern California Edison (SCE), Bear Valley Electric (BVE), Colton Public Utilities, and Needles Public Utility Authority.

³ Natural Gas utilities include Southern California Gas Company (SCG) and Southwest Gas (SWG).

⁴ Revised growth forecasts prepared by Hoffman (2009)

⁵ Not adjusted to revised forecast per Hoffman (2009) may overstate emissions due to growth.

These emissions are separated by scope as follows. Scope 1 and 2 emissions were quantified and included in the External Inventory. Several Scope 3 emissions were also quantified for informational purposes but not included in the External Inventory.

Scope 1:

- Stationary emissions from fuels consumed (stationary source, industrial, commercial, and

residential)

- Mobile emissions from fuels consumed by on- and off-road vehicles
- Methane Emissions from landfills
- Agricultural emissions
- Wastewater treatment and discharge emissions (fugitive)
- Miscellaneous emissions

Scope 2:

- Emissions associated with purchased electricity used at all facilities in the County’s LUA (industrial, commercial, and residential)
- Emissions associated with electricity used to import water

Scope 3:

- High GWP GHGs
- Rail emissions

Calculation Approach

Emissions were estimated using the appropriate emission factors for each of the sources included in the External Inventory (see **Table A-2**). For electricity consumption, the Southern California Edison (SCE) emission factor was applied to all electricity within the External Inventory boundaries because these factors were the most specific factors publicly available. All other emissions were calculated based on the emission factors provided in the following guidance documents:

- California Air Resources Board (CARB) Local Governments Operations Protocol (LGOP) (2008)
- California Climate Action Registry (CCAR) and General Reporting Protocol (2009)
- CARB California Greenhouse Gas Inventory Data 1990-2006 (2009)
- California Energy Commission (CEC) Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (2006)
- U.S. Environmental Protection Agency (USEPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007 (2009).
- Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006)

Emission factors and references are summarized in **Table A-2**.

Table A-2. GHG Emission Factors

Fuel	Emission Factor	Source
Compressed Natural Gas (CNG) (Vehicle)	0.054 Kg CO ₂ /Standard Ft ³	USEPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006 (2008)
Motor Gasoline (Vehicle)	8.81 Kg CO ₂ /US gal	Provided in the California Local Government

Appendices

Propane (Vehicle)	5.74 Kg CO ₂ /US gal	Operations Protocol (CARB et al. 2008)
Diesel (Vehicle)	10.15 Kg CO ₂ /US gal	
Natural Gas	0.0546 Kg CO ₂ /Standard Ft ³	
	0.1 g NO ₂ /MMBTU	
	5 g CH ₄ /MMBTU	
Other Fuels	Variable ¹	SQAQMD
Electricity	290.87 kg CO ₂ /MWh	CCAR (2009a) Public Reports and USEPA eGrid2007 (2005 data)
	2.04 kg NO ₂ /GWh	
	13.88 kg CH ₄ /GWh	

Notes:

¹ Other fuels were included in the SCAQMD Inventory. Associated emissions are based on emission factors from CARB's Regulation for the Mandatory Reporting of GHG Emissions and fuel High Heating Values (HHVs) from USEPA's AP-42 document.

South Coast Air Quality Management District Inventory

Several emissions categories included in the External Inventory are based on emissions data provided by the South Coast Air Quality Management District (SCAQMD) in an inventory of GHG emissions it prepared for the County, dated, May 2009, and revised December 2010 (SCAQMD Inventory). The SQAQMD Inventory, attached as Appendix D to the GHG Reduction Plan includes an inventory of emissions in the entire County area, including both incorporated and unincorporated areas ("Countywide" inventory). These Countywide emissions are not broken out by each incorporated or unincorporated area. SCAQMD scaled the Countywide emissions to the County's LUA area using the ratio of the population within the LUA area to that of the entire County. The base year for SCAQMD's Countywide and LUA GHG inventories is 2002. This base-year inventory was then projected to future years (2007, 2020) using the socioeconomic forecasts provided by Southern California Association of Governments (SCAG) for the 2007 Air Quality Management Plan (AQMP).

2020 Unmitigated Emissions Projections

To measure future reductions, an unmitigated emissions projection was developed for the year 2020 (2020 unmitigated). This projection is used in the reduction plan to help set targets and for future monitoring of emission reductions.

The 2020 unmitigated projections are developed based on current energy consumption and growth rates provided by the County, SCAQMD, CARB, the U.S. Census Bureau, and other data sources. The assumptions associated with growth rates provided in **Table A-3** do not assume the implementation of any federal, state, or local reduction measures but rather projects the future emissions based on current energy and carbon intensity in the existing economy.

Table A-3. 2020 Unmitigated Emission Projection Assumptions

Emission Source	Percent Annual Increase	Assumption Source
Stationary Sources		
Cement Plants	1.5% ¹	CARB Scoping Plan and U.S. Geological Survey cement production data
Other Sources	Variable ²	SCAQMD
Residential		
Electricity and Natural Gas	0.4%	County growth Forecasts ³
Other Fuel Combustion	2.2%	SCAQMD
Commercial		
Electricity and Natural Gas	1.9%	County growth Forecasts ³
Other Fuel Combustion	1.7%	SCAQMD
Industrial		
Electricity and Natural Gas	1.9%	County growth Forecasts ³
Other Fuel Combustion	1.5%	SCAQMD
Transportation: On-Road	2.2% ⁴	EMFAC
Transportation: Off-Road	3.1% ⁴	OFFROAD
Landfill Waste	1.075%	Waste Management
Agriculture	(1.8%)	SCAQMD
Wastewater	1.8%	General Plan
Water Conveyance	1.6%	General Plan
Miscellaneous	1.8%	SCAQMD

Notes:

¹ Cement plant emissions grow 2.0% annually from 2008 to 2020 based on CARB projections; because cement plant emissions *decreased* from 2007 to 2008, the adjusted growth rate from 2007 to 2020 is likely lower than 2%. The 1.5% annual growth rate is equal to the SCAG RTP employment forecast growth from 2008 to 2020 in all of San Bernardino County.

² SCAG and AQMP growth factors depend on each specific source

³ Revised growth forecasts prepared by Hoffman (2009).

⁴ EMFAC and OFFROAD growth factors represent average for each specific source

Population, housing, and employment estimates and forecasts for 2000, 2007, and 2020 are presented in **Table A-4**. These projections were used to project building energy end use emissions.

Table A-4. County Population, Housing, and Employment Estimates and Forecasts

Sector	2000	2007	2020
Population	276,131	283,662	306,437
Housing	91,300	91,803	96,886
Employment	45,147	49,439	63,355

Source: Hoffman 2009.

Growth factors for 2007 through 2020 were calculated as the ratio of 2020 projections to year 2007 estimates. The 2007 consumption estimates were multiplied by those growth factors to project 2020 consumption, as follows:

- Residential Energy End Use—projected using growth in the number of households,
- Commercial Energy End Use—projected using growth in the number of jobs, and
- Industrial Energy End Use—projected using growth in the number of jobs.

External Inventory

This section presents the External Inventory for the County, categorized by sectors of emissions.

Building Energy End Use Emissions

The following section describes the methodology for calculating GHG emissions for building energy end use in the External Inventory. Building energy end use for residential and commercial buildings, and industrial buildings and processes is a significant component of the County's external GHG inventory, accounting for approximately 20 percent of the County's total emissions in 2007.

Electricity and Natural Gas Consumption

Data Collection

Energy consumption data were obtained from SCE, Bear Valley Electric (BVE), Southern California Gas Company (SCG), and Southwest Gas (SWG) and broken down by account type (i.e., residential, commercial, industrial, and institutional). Electricity consumption in kilowatt hours was collected from SCE and BVE, while natural gas consumption was collected from SCG and SWG. Indirect GHG emissions for 2007 from electric consumption were calculated based on a weighted average of utility energy contribution to the SBC region. The data provided by SCE was calculated specifically for the LUA area such that all reported consumption was consumed only within the County's LUA area. The BVE data were provided for each jurisdiction such that consumption within the County's LUA area could easily be determined. All electricity consumption data were segregated into the following categories: residential, commercial/industrial, and municipal/street lighting. The SCG data were provided by jurisdiction such that consumption within the County's LUA area could easily be determined.

This study also employed County Assessor data (San Bernardino County 2009) and U.S. Energy Information Administration (USEIA) end use profile data to achieve the following goals: 1) examine bottom-up residential and commercial energy emissions and compare these estimates to top-down estimates from the utility data; and 2) support reduction quantification for the 2020 mitigated inventory. In this analysis, the County assessor data and energy use profiles are used to identify the mix of uses in the County and unmitigated emissions on a per-unit basis. General plan growth forecasts are applied to project future emissions from the residential, commercial, and institutional sectors.

Emissions Calculations

Emission factors were used to calculate GHG emissions due to electricity and natural gas usage within the County LUA area. Because SCE accounts for roughly 97 percent of the electricity supplied to the County's LUA area, the SCE emission factor for electricity was chosen to reflect that of the entire County LUA area (see **Table A-2** above).

Residential Energy Consumption

Data Collection

To supplement the utility data described above, this analysis used average household energy intensity factors from the 2005 Residential Energy Consumption Survey (RECS), a

household survey conducted every 4 years by the EIA (USEIA 2005). Intensity factors for end-uses of household energy (i.e., space heating fuel intensity, air conditioning intensity, water heating, and appliances and lighting) by housing vintage (i.e., decade the house was built) were calculated for the entire U.S. and adjusted to represent the average energy intensity for California. These intensity factors were used to refine residential energy emissions estimates for the County.

The total number of residential units, the year built, and the square footage were collected from the County Assessor's database and summed. Heating degree days and cooling degree days with a base temperature of 65° F were estimated by averaging the 17 weather stations in the County calculated by the National Oceanic & Atmospheric Administration in its *Annual Degree Days to Selected Bases, 1971–2000*, released June 20, 2002. Estimates of the number of households in the County using natural gas, electricity, propane, wood, or no fuel for heating were collected from the 2007 American Community Survey (ACS) (U.S. Census Bureau 2007). Consumption of each fuel for each end use was estimated by multiplying either the number of households (for water heating and lighting/appliances) or the total square footage (for space heating and air conditioning) by the RECS energy consumption intensity factor for each end use. For fuel-specific calculations (i.e., space heating, water heating, and appliances), consumption of the fuels was estimated only for those households using the fuels designated in the ACS data. This was repeated for each vintage of housing units and summed. Consumption of natural gas, electricity, and LPG was then summed across end uses. The ratio of natural gas consumption to electricity consumption was identified as 1.58:1 on a BTU basis.

The SWG data did not distinguish between LUA area and non-LUA area, so additional effort was required to estimate the natural gas consumption within the LUA area. Because SCG residential consumption for the LUA area was known, the SCG residential consumption for the LUA area was subtracted from the total estimated residential natural gas consumption, with the balance being SWG residential consumption. The estimated SWG residential consumption within the LUA area was approximately 15.7 percent of the total reported by SWG. The estimated SWG consumption and reported SCG consumption were summed to provide total residential natural gas consumption within the LUA area.

Emissions Calculations

Residential energy consumption within the LUA area resulted in GHG emissions of 440,850 MTCO_{2e} in 2007 and 467,217 MTCO_{2e} in 2020, accounting for approximately seven (7) percent and six (6) percent of the External Inventory in the respective years.

The SCAQMD Inventory for the County estimated emissions from residential fuel combustion, based on data from the Mojave Desert Air Quality Management District (MDAQMD), assumptions and data in the 2007 South Coast AQMP, emission factors from CARB's Regulation for the Mandatory Reporting of GHG Emissions, and fuel High Heating Values (HHVs) from USEPA's AP-42. The following categories of fuel combustion from the SCAQMD Inventory were included in the External Inventory because these categories augment the fuel use data obtained from RECS data: liquefied petroleum gas (LPG)/propane/butane, diesel/distillate oil, gasoline, jet fuel, residual fuel oil, compressed natural gas (CNG), and digester gas.

To determine emissions associated with the County's LUA, total Countywide GHG emissions were scaled by the ratio of residential natural gas combustion in the unincorporated County to residential natural gas combustion in the entire County for 2007 as provided by SCG. This ratio is 0.17.

Commercial and Industrial Energy Consumption

Data Collection

To supplement the utility data described above, this analysis used average commercial energy intensity factors from the 2005 Commercial Building Energy Consumption Survey (CBECS), a commercial survey conducted every four (4) years by the EIA (USEIA 2003, 2005). The commercial/industrial electricity consumption obtained from SCE and BVE was split into separate commercial and industrial sectors based on the ratio of natural gas consumption in the commercial and industrial sectors, as reported by SGC and SWG. To account for the non-LUA area consumption reported by SWG, the SWG commercial and industrial data needed to be adjusted in a manner similar to that described for the residential sector. As described above, the estimated SWG residential consumption within the LUA area was 15.7 percent of the total reported by SWG. This percentage was applied to the commercial sector to account for consumption within the LUA area only. The estimated SWG consumption and reported SCG consumption were summed to provide total commercial natural gas consumption within the LUA area.

Emissions Calculations

Commercial energy consumption within the LUA area resulted in GHG emissions of 246,364 MTCO₂e in 2007 and 314,604 MTCO₂e in 2020, accounting for approximately four (4) percent of the External Inventory in each year. Industrial energy consumption within the LUA area resulted in GHG emissions of 593,715 and 760,834 MTCO₂e in 2007 and 2020, accounting for approximately nine (9) percent and ten (10) percent of the External Inventory in the respective years.

The SCAQMD Inventory estimated emissions from commercial fuel combustion, based on data from the MDAQMD, assumptions and data in the 2007 SCAQMP, emission factors from CARB's Regulation for the Mandatory Reporting of GHG Emissions, and fuel HHVs from USEPA's AP-42 emissions factors. The following categories of fuel combustion listed in the SCAQMD Inventory were included in the External Inventory because these categories augment the natural gas fuel use data obtained from RECS data: LPG/propane/butane, diesel/distillate oil, gasoline, jet fuel, residual fuel oil, CNG, and digester gas.

To determine emissions associated with the County's LUA area, total Countywide GHG emissions were scaled by the ratio of commercial natural gas combustion within the LUA versus commercial natural gas combustion in the entire County in 2007, as provided by SCG. This ratio is approximately 0.03.

Emissions resulting from the use of energy in buildings are an important aspect of the total inventory of GHG emissions. Residential, commercial, and industrial uses account for 20 percent, 18 percent, and 28 percent of CO₂ emissions from fossil fuel combustion in the United States, respectively (USEPA 2008a; CARB 2007a). GHG emissions from building

energy end use represent 20 percent of the County's external total emissions for the year 2007.

Current and Projected Emissions

Table A-5 presents the total GHG emissions from each building energy end use subsector—by end-use when available—for the years 2007 and 2020 (unmitigated). GHG emissions from building energy use represent 20 percent of the County's external total emissions for the year 2007 and 2020 unmitigated.

Table A-5. GHG External Emissions by Building Energy End-Use

Sector	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)	Percentage of 2007 Building Energy End Use Emissions
Residential			
Heating	95,814	101,119	7.5
Air Conditioning	67,786	71,538	5.3
Water Heating	95,357	100,636	7.4
Refrigeration	25,851	27,283	2.0
Lighting/Other Appliances	148,938	157,185	11.6
Other Fuel Combustion	7,105	9,456	0.6
Subtotal	440,851	467,217	34.4
Commercial			
Space Heating	58,001	74,327	4.5
Cooling	22,324	28,608	1.7
Ventilation	8,704	11,154	0.7
Water Heating	17,801	22,811	1.4
Lighting	46,241	59,256	3.6
Cooking	13,073	16,754	1.0
Refrigeration	22,219	28,473	1.7
Office Equipment	1,849	2,369	0.1
Computers	3,546	4,543	0.3
Other	19,735	25,290	1.5
Other Fuel Combustion	32,871	41,018	2.6
Subtotal	246,364	314,603	19.2
Industrial*	593,716	760,834	46.4
Total	1,280,931	1,542,654	100.0

* Industrial end-use emissions were unable to be broken down by end-use due to SCAQMD data restrictions. The industrial use sector includes electricity and natural gas consumption. Combustion emissions are included in the stationary source sector of this inventory.

Transportation and Land Use Emissions

The following section discusses the methodology for calculating GHG emissions for on- and off-road transportation in the External Inventory.

On-Road Transportation

Emissions Calculations

GHG emissions for on-road mobile sources were calculated for 2007 and 2020 based on the SCAQMD Inventory. These GHG emissions within the LUA area are 1,631,666 and 2,176,130 MTCO₂e in 2007 and 2020, accounting for approximately 26 percent and 28 percent of the External Inventory in the respective years. To calculate CO₂ and CH₄ emissions from on-road mobile sources, SCAQMD used the CARB EMFAC2007 V2.3 mobile source emissions model. SCAQMD staff calculated N₂O emissions based on CARB methodology of multiplying fuel consumption for on-road vehicles by N₂O emissions factor. On-road transportation emissions associated with the County's LUA area were established by scaling SCAQMD's on-road mobile County emissions by the ratio of population in the unincorporated County to the population in the entire County for 2007. This ratio is approximately 0.15.

Data Collection

On-road transportation data were collected from the SCAQMD Inventory.

Off-Road Transportation

Emissions Calculations

GHG emissions for off-road mobile sources were included for 2007 and 2020, based on the SCAQMD Inventory. These emissions within the LUA area are 157,184 and 235,053 MTCO₂e in 2007 and 2020, accounting for approximately three (3) percent of the External Inventory in each year. Off-road transportation emissions associated with the County's LUA area were established by scaling SCAQMD's off-road mobile County emissions by the ratio of population in the unincorporated County to the population in the entire County for 2007. This ratio is approximately 0.15.

SCAQMD estimated emissions for construction equipment, recreational vehicles, pleasure craft, and other off-road equipment using CARB's OFFROAD model. For emissions associated with aircrafts, locomotives, and cargo handling equipment at intermodal facilities that are not included in OFFROAD model, SCAQMD used alternative methodologies to estimate these emissions. Locomotives are defined as Scope 3 sources in this inventory due to the County's limited or non-existing jurisdiction over these sources. Emissions from these sources are reported for informational purposes in the Scope 3 section.

Emissions resulting from the on-road and off-road transportation sector are an important aspect of the total inventory of GHG emissions, accounting for one-third of U.S. CO₂ emissions from fossil fuel combustion and approximately 40 percent of California's CO₂ emissions (USEPA 2008; CARB 2007a). GHG emissions from transportation represent four (4) percent of the County's external energy-related emissions and three (3) percent of the County's external total emissions for the year 2007. GHG emissions were estimated

based on EMFAC and OFFROAD modeling performed in the SCAQMD Inventory. Data Collection

Off-road transportation data were included in the SCAQMD Inventory.

Current and Projected Emissions

Table A-6 presents the total transportation GHG emissions by vehicle type for the year 2007 and 2020 (unmitigated). Transportation GHG emissions are listed by general vehicle class.

Table A-6. GHG External Emissions from Transportation by Vehicle Type

Vehicle Type	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)^a	Percentage of 2007 Transportation Emissions
On-Road			
Passenger/light-duty ^b	929,486	1,163,397	52.0
Medium-duty ^c	207,321	261,422	11.6
Heavy-duty ^d	470,645	716,451	26.3
Motorcycles	4,662	8,241	0.3
Buses/Motorhomes ^e	19,552	26,621	1.1
Subtotal	1,631,666	2,176,132	91.2
Off-Road			
Aircraft	31,455	75,652	1.8
Recreational Boats	21,060	31,942	1.2
Off-Road Recreational Vehicles	2,588	4,187	0.1
Off-Road Equipment	94,878	116,566	5.3
Farm Equipment	7,204	6,707	0.4
Subtotal	157,185	235,054	8.8
Total	1,788,851	2,411,186	100.0

Notes:

^a 2020 unmitigated emissions were projected based on SCAQMD Inventory

^b Gross weight 0–5,750 pounds (sedans, pick-up trucks, SUVs, and vans).

^c Gross weight 5,751–8,500 pounds (large pickups and SUVs [Ford F450, F550, Dodge Ram 2500, etc.]).

^d Gross weight 8,500+ pounds (fire trucks, dump trucks, semi trucks, water trucks, flatbed trucks, etc).

^e Includes diesel and gas urban buses, school buses, other buses, and motor homes.

Stationary Source Emissions

The following section discusses the methodology for calculating GHG emissions for stationary sources in the External Inventory. Specifically, this source category represents emissions from fuel combustion (such as diesel, gasoline, and propane) and fugitive emissions of CH₄ and N₂O at industrial facilities located in the County, provided by SCAQMD Inventory. .

Cement Plants

Cement plants emit large quantities of GHG emissions through activities including fuel combustion, electricity use, and clinker production. The fuel combustion activities at these plants include those associated with cement production, building operations, power plants/cogeneration facilities, and any other activity that consumes fuel. GHG emissions from clinker production result from the chemical reactions involved in producing the intermediate cement product from raw materials. There are three cement plants within the County's LUA area: 1) Mitsubishi Cement Plant, Lucerne Valley; 2) CalPortland Cement Plant, Colton; and 3) TWI Cement Plant, Oro Grande. The County has land use permitting authority over these plants' operations. A fourth cement plant, CEMEX, is in Victorville on incorporated land, and was therefore not included in the External Inventory.

Data Collection

GHG emissions data for cement plants for 2008 were obtained from CARB³. Cement plants are required to report their emissions as stipulated by the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. To estimate cement plant emissions for 2007, 2008 emissions were estimated based on Southern California clinker production. Because clinker is the primary ingredient in cement and also requires the most energy to produce in relation to other cement ingredients, clinker production is a reasonable proxy for estimating emissions. According to the U.S. Geological Survey (USGS), Southern California clinker production was 8,661 MT in 2007 and 7,978 MT in 2008; the decline in clinker production is likely a result of recent economic conditions⁴. The 2008 cement emissions (2,514,034) were multiplied by 1.086 to estimate cement emissions for 2007.

Emissions Calculations

CARB assumes a two (2) percent annual growth in cement production from 2004 to 2020⁵. This growth rate was used to calculate cement emissions, but it is likely an overestimate, because California cement production declined 1.3 percent on average from 2004 to 2007 and 1.8 percent from 1994 to 2007⁶. GHG emissions for cement plants were included for 2007 and 2020, based on CARB data. These emissions within the LUA area are 2,729,261 and 3,188,403 MTCO₂e in 2007 and 2020, accounting for approximately 46 percent and 43 percent of the External Inventory in the respective years.

³ Pers. Comm. Bannerman.

⁴ U.S. Geological Survey 2009.

⁵ California Air Resources Board 2008a, 2009a.

⁶ U.S. Geological Survey 2009.

Other Stationary Sources

The following section discusses methodology for calculating GHG emissions for other stationary sources in the External Inventory.

Data Collection

The GHG emissions for stationary sources were obtained from the SCAQMD Inventory. These emissions result from fuel use other than natural gas consumption, which is accounted for in the industrial category above. To determine emissions associated with the County's LUA area, total Countywide GHG emissions were scaled by the ratio of industrial natural gas combustion within the LUA area versus industrial natural gas combustion in the entire County in 2007, as provided by SCG. This ratio is approximately 0.19. The growth factors for each source consuming natural gas were used to determine natural gas emissions for 2007 and 2020, and these emissions were subtracted from the respective GHG emissions for each inventory year.

The following categories were included in the External Inventory: oil and gas production (combustion), manufacturing and industrial, food and agricultural processing, fuel combustion, coatings and related processes, cleaning and surface coatings, petroleum production and marketing, chemical, mineral processes, industrial processes, asphalt paving/roofing, and sewage treatment.

The SCAQMD Inventory for stationary industrial sources also includes emissions from natural gas combustion; the emissions associated with each fuel source were aggregated to provide the total emissions for each category. In this inventory, natural gas emissions were calculated separately, based on data from the utilities and as described above. To avoid double counting emissions from natural gas combustion, the percentage of emissions associated with natural gas consumption was subtracted from the SCAQMD total stationary source inventory.

Emissions Calculations

Other stationary source emissions account for approximately three (3) percent of the County's energy-related emissions and two (2) percent of the County's total emissions in 2007. This source category represents emissions from fuel combustion (such as diesel, gasoline, and propane) and fugitive emissions of CH₄ and N₂O at industrial facilities in the County. (SCAQMD Inventory).

County stationary source GHG emissions account for 137,714 MTCO₂e and 167,767 MTCO₂e for year 2007 and 2020 unmitigated GHG emissions, respectively. These GHG emissions represent two (2) percent of the County's GHG emissions inventory for the years 2007 and 2020 (unmitigated). Stationary source GHG emissions are listed by general category. GHG emissions were estimated in the SCAQMD Inventory.

Current and Projected Emissions

County stationary source emissions account for 46 and 43 percent of the County's GHG emissions inventory for the year 2007 and 2020 (unmitigated), respectively. Stationary source GHG emissions are listed by general category. GHG emissions were estimated in the SCAQMD

Inventory. **Table A-7** presents the total stationary source GHG emissions for each stationary source category for the year 2007 and 2020 (unmitigated).

Table A-7. GHG External Emissions from Stationary Sources by Category

Stationary Source Category	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)
Cement Plants		
Clinker Production	1,656,120	1,823,939
Fuel Combustion	1,070,378	1,178,842
Fugitive Emissions	2,763	3,043
Subtotal	2,729,261	3,005,824
Other Stationary Source Emissions		
Oil and Gas Production (combustion)	369	369
Manufacturing and Industrial	84,648	110,502
Food and Agricultural Processing	605	779
Other (Fuel Combustion)	30,806	31,560
Coatings and Related Processes	234	323
Other (Cleaning and Surface Coatings)	52	82
Petroleum Marketing	7,521	7,639
Chemical	367	616
Food and Agriculture	7	7
Mineral Processes	501	652
Other (Industrial Processes)	63	89
Asphalt Paving/Roofing	26	33
Sewage Treatment	11,975	15,115
Subtotal	137,174	167,766
Total	2,866,435	3,173,590

Water Conveyance Embodied Emissions (Imported Water)

The following section discusses methodology for calculating GHG emissions for water conveyance in the External Inventory due to importation of water from outside the County.

Data Collection

Water supply and conveyance involves indirect emissions from the generation of electricity required to supply the County with imported water. Imported water comes from the SWP and the Metropolitan Water District of Southern California (Metropolitan). Imported water quantities were supplied by the General Plan *Circulation and Infrastructure Background Report* (San Bernardino County 2006a).

Emissions Calculations

Indirect emissions associated with water importation to the LUA area resulted in GHG emissions of 10,696 and 13,211 MTCO₂e in 2007 and 2020, as shown in **Table A-8**, accounting for approximately 0.2 percent of the External Inventory for each of the respective years. Electricity and natural gas used for water pumping and treatment in the County was included in the utility data described above. The energy used to transport water from outside of the County is not included in this utility data and was obtained from the CEC 2006 report, *Refining Estimates of Water-Related Energy Use in California*, which provides proxies for embodied energy use for water in southern and northern California (CEC 2006).

Table A-8. GHG External Emissions from Water Conveyance by Imported Source

Water Source	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)
State Water Project	9,743	12,522
Metropolitan's CRA	953	689
Total	10,696	13,211

Information in the CEC report regarding electricity usage and loss factors, and imported water quantities listed in the General Plan *Circulation and Infrastructure Background Report*, was used to calculate indirect emissions from water importation to the County from the Colorado River and from the State Water Project (SWP) (San Bernardino County 2006a). Electricity emission factors for the CAMX/WECC California region were used (724.12 lbs CO₂/MWh, 30.24 lbs CH₄/GWh, and 8.08 lbs N₂O/GWh) (USEPA 2009c). Last, emissions associated with the County's LUA area were based on total Countywide GHG emissions for water supply and conveyance, as calculated above, by scaling these Countywide emissions by the ratio of the population in the unincorporated County to that of the entire County for 2007. This ratio is approximately 0.15.

County water supply and conveyance GHG emissions due to importation of water account for 10,696 MTCO₂e and 13,211 MTCO₂e for year 2007 and 2020 (unmitigated) GHG emissions, respectively. These GHG emissions represent approximately 0.2 percent of the County's GHG emissions inventory for the year 2007 and 2020 (unmitigated).

Landfill Emissions

The following section discusses the methodology for calculating GHG emissions for landfills in the External Inventory.

Landfill Methane Emissions

Data Collection

The County operates six active landfills and maintains 14 closed landfill sites. The County's Solid Waste Management Department is responsible for the management of all 20 landfills. The County's active landfills range in capacity from just over 3,000 cubic yards at Barstow and Landers to over 80,000 cubic yards at Victorville. In total, the County was responsible for the management of 1,920,829 tons of solid waste in 2007 generated in the unincorporated areas of the County and the incorporated cities in the County. Several of the landfills already have control systems in place for methane capture. The landfills contain waste that has been generated by the entire County population over a long historical period; the oldest landfill site opened in 1949.

In addition to County-owned and operated landfills, there are five private landfills in the County. Due to limited data for two of these landfills, which suggests that these landfills are small, methane emissions from only the remaining three private landfills were included in the External Inventory.

Waste in place (WIP) data, opening and closing dates, and methane capture data from the USEPA were incorporated into the analysis (USEPA 2009b). Waste disposal tonnage for all waste landfilled from the California Integrated Waste Management Board (CIWMB) was reported for 2005 through 2007 and used to project incoming waste for future years (CIWMB 2009).

For further discussion of waste data collection methods, refer to Appendix B.

Emissions Calculations

Landfill emissions associated with the LUA area resulted in GHG emissions of 213,191 and 359,317 MTCO₂e in 2007 and 2020, accounting for approximately three (3) percent and five (5) percent of the External Inventory in the respective years. GHG emissions from landfill waste are primarily the result of methane generation from anaerobic decomposition processes. Methane emissions from landfills were calculated for County-owned landfills, privately-owned landfills within the County's LUA area, and for waste generated by the unincorporated County but landfilled outside County borders. These calculations were performed according to the guidelines outlined in the Local Government Operations Protocol (CARB et al., 2008).

Methane emissions from landfills were calculated using a first order kinetics model. For a particular amount of WIP) at a landfill, it is assumed that the waste was deposited in the landfill in equal installments for each of the years the landfill was open. The methane generated in the current year (before landfill gas recovery) can be estimated as:

Methane = $(k \cdot L_o \cdot R_n \cdot WIP \cdot e^{-kA} - e^{-kB}) / (e^{-k} - 1)$ where:

- k = the exponential time constant of decay.
- L_o = methanogenic potential of the waste (cubic meters of methane per kg of waste).
- WIP = total waste-in-place in the landfill in the inventory year (metric tons).
- R_n = a factor that incorporates the density of methane and any unit conversions required to balance the equation dimensionally.
- A = the difference between the current year (plus one) and year the landfill opened.
- B = the difference between the current year (plus one) and the most recent year waste was deposited in the landfill.

The k and L_o coefficients for this analysis were selected based on the USEPA LandGEM model assumptions for the climatological conditions specific to San Bernardino County. Landfill size and control technology were also accounted for in these calculations. CO₂e emissions were calculated by multiplying the methane emissions from landfills by the GWP of methane of 21, based on LGOP guidance.

Methane emissions associated with WIP at private landfills within the LUA area were calculated for the following three private landfills: California Street Landfill, Metropolitan Water District of Southern California—Iron Mountain, and Mitsubishi Cement Plant Cushenbury Landfill.

In this analysis, the following were assumed: an annual waste to landfill growth rate of 1.75 percent (same as for the County-owned landfills); and 90 percent of new waste sent to landfills with existing methane recovery systems in place (USEPA 2009b).

The SCAQMD Inventory includes landfill methane emissions and carbon dioxide emissions from landfill flaring. These emissions were reported by individual landfill facilities. The SCAQMD Inventory also included carbon dioxide emissions from landfill flaring. These emissions were not included in this Plan, consistent with applicable protocols, as described below.

Methane emissions from waste generated by a jurisdiction but disposed of outside its organizational boundaries are considered to be “Scope 3 emissions” or “optional,” according to Local Government Operations Protocol (Protocol). The Protocol recommends that these emissions be included in the emissions inventory because doing so provides an opportunity for innovation in GHG management. Therefore, these emissions were included in the County’s External Inventory because the County is responsible for diversion programs that affect the amount and composition of waste sent to landfills outside of the County. To calculate these emissions, waste disposal tonnages from the CIWMB for 2005 through 2007 were used to project incoming waste for future years (CIWMB 2009). Emissions were calculated as described above for the County-owned and private landfills. In addition, the following assumptions were applied: an annual waste to landfill growth rate of 1.75 percent (same as County-owned landfills); and 93 percent of new waste sent to landfills with existing methane recovery systems in place (USEPA 2007).

Landfill Flaring CO₂ Emissions

Although the composition of landfill emissions is estimated to be about 50 percent CH₄ and 50 percent CO₂ by volume, CO₂ emissions from anaerobic digestion of solid waste in landfills are considered to be of biogenic origin. The SCAQMD reported both CO₂ and CH₄ emissions from landfill flaring in their inventory. The LGOP and IPCC recommend that biogenic emissions be reported only as an informational item (CARB et al., 2008; IPCC 2006). CO₂ emissions from combustion of recovered landfill gas (i.e., flared methane) are also not typically reported, as the CO₂ emissions are considered to be of biogenic origin. Consequently, the inventory presented in this report does not include CO₂ from flaring, in contrast to the SCAQMD inventory.

Current and Projected Emissions

County solid waste–related GHG emissions by landfill for 2007 and 2020 (unmitigated) projections are presented in **Table A-9**. 2020 unmitigated GHG emissions were projected through a first-order kinetics method based on:

- current waste in landfills from prior years (i.e., “waste in place”)
- projected new waste added to the landfills that is generated between 2007 and 2020

Landfill emissions account for approximately three (3) and five (5) percent of the External Inventory for the year 2007 and 2020 (unmitigated), respectively.

Table A-9. GHG External Emissions from Solid Waste/Landfills

Landfill Site	Landfill Status	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)
County-Owned Landfills			
Barstow	Active	18,110	14,626
Colton	Active	26,167	21,619
Landers	Active	13,830	11,294
Mid-Valley	Active	43,988	39,563
San Timoteo	Active	21,944	18,480
Victorville	Active	19,690	17,730
Apple Valley	Closed	3,547	2,735
Baker	Closed	61	47
Big Bear	Closed	4,491	3,462
Hesperia	Closed	5,280	4,071
Lenwood-Hinkley	Closed	918	708
Lucerne Valley	Closed	673	519
Milliken	Closed	31,366	24,184
Morongo Valley	Closed	801	617
Needles	Closed	1,437	1,138
Newberry	Closed	546	421
Phelan	Closed	2,553	1,968
Trono-Argus	Closed	459	354

Landfill Site	Landfill Status	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)
Twenty-Nine Palms	Closed	2,623	2,022
Yermo	Closed	231	178
Yucaipa	Closed	6,051	4,666
New Waste to landfill with methane recovery	NA	NA	119,131
New Waste to landfill without methane recovery	NA	NA	52,947
Subtotal		204,766	342,480
Private Landfills Located in the County			
California Street	Active	3,296	2,958
Mitsubishi Cement Plant Cushenbury	Active	4,979	4,438
Metro Water Dist—Iron Mountain	Closed	20	15
New Waste to landfill with methane recovery	NA	NA	7,701
New Waste to landfill without methane recovery	NA	NA	72
Total		8,295	15,184
Projected Waste to Landfills outside County Borders			
New Waste to landfill with methane recovery	NA	100	1,271
New Waste to landfill without methane recovery	NA	30	383
Subtotal		130	1,654
Total		213,191	359,318

Fugitive Emissions from Wastewater Treatment

The following section discusses methodology for calculating GHG emissions for wastewater treatment in the External Inventory.

Emissions Calculations

Fugitive emissions from wastewater treatment emissions associated with the LUA resulted in GHG emissions of 27,994 and 35,525 MTCO₂e in 2007 and 2020, accounting for approximately 0.4 percent of the External Inventory in each of the respective years as shown in **Table A-10**. Treatment of wastewater from both domestic (municipal sewage) and industrial sources can produce fugitive CH₄ and N₂O emissions (USEPA 2007). Due to lack of data on industrial wastewater treatment, only GHG emissions from domestic wastewater were analyzed. Wastewater from domestic sources is treated to remove soluble organic matter, suspended solids, pathogenic organisms, and chemical contaminants. CH₄ is generated when microorganisms biodegrade soluble organic material in wastewater under anaerobic conditions. N₂O is generated during both nitrification and denitrification of the nitrogen present in wastewater, usually in the form of urea, ammonia, and proteins (USEPA 2007).

Table A-10. GHG External Emissions from Wastewater Treatment

Water Source	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)
Wastewater Treatment	27,994	35,525

CARB’s current and 2020 inventory provides State-wide emissions for CH₄ and N₂O from wastewater treatment. These emissions were scaled by the reported California population in the appropriate years to derive State-wide per capita emissions of CH₄ and N₂O from wastewater treatment. California Department of Finance population projections were used for the 2020 population projection and to scale to the emissions to the County. To determine emissions associated with the County’s LUA, total Countywide GHG emissions as calculated above were scaled by the ratio of population in the unincorporated County to the entire County for 2007. This ratio is approximately 0.15.

Data Collection

CARB’s current and 2020 inventory provides State-wide emissions for CH₄ and N₂O from wastewater treatment as discussed above.

Agriculture

The following section discusses the methodology for calculating GHG emissions for agriculture in the External Inventory.

Data Collection

The agriculture emissions estimates included in the report are based on the SCAQMD Inventory for San Bernardino County, which included the following agriculture source categories:

- Farming Operations (enteric fermentation and manure management from dairy operations), and
- Waste Burning and Disposal (prescribed burning).

The SCAQMD Inventory emissions estimates for agriculture emissions are based on information provided by the County Department of Agriculture, Weights and Measures for 1990, and information obtained from CARB (2000) and the Andreae and Merlet report (2001).

Emissions Calculations

To determine emissions associated with the County's LUA, total Countywide GHG emissions were scaled by the ratio of population in the unincorporated County to that in the entire County for 2007. This ratio is approximately 0.15.

Agricultural emissions account for approximately one (1) percent of the County's total emissions in 2007. This source represents CH₄ and N₂O emissions from dairy manure management and enteric fermentation and prescribed burning provided by SCAQMD. Other agricultural emissions were not included in SCAQMD's I Inventory; these sources are expected to be minor and were not quantified in this report.

County agricultural emissions account for GHG emissions of 86,854 MTCO₂e and 68,526 MTCO₂e for year 2007 and 2020 (unmitigated) GHG emissions, respectively. These GHG emissions represent one (1) percent of the County's GHG emissions inventory for the year 2007 and 0.7 percent of the 2020 (unmitigated) emissions.

Table A-11. GHG External Emissions from Agricultural Activity

Agricultural Activity	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)
Farming Operations	33,180	19,580
Waste Burning and Disposal	31,439	31,411
Total	64,619	50,991

Miscellaneous

The following section discusses methodology for calculating GHG emissions for additional miscellaneous sources in the External Inventory.

Data Collection

GHG emissions estimates miscellaneous sources included in the plan are based on the SCAQMD Inventory, which includes methane emissions from two additional, minor sources:

- Residential fires, and
- Cooking (charbroiling emissions).

Only methane emissions from these two sources were included because CO₂ emissions from wood combustion (fires) are considered biogenic (CARB et al., 2008).

Emissions Calculations

To determine emissions associated with the County's LUA, total Countywide GHG emissions as calculated above were scaled by the ratio of population in the unincorporated County to the entire County for 2007. This ratio is approximately 0.15. Emissions from fires and cooking within the LUA resulted in GHG emissions of 329 and 414 MTCO₂e in 2007 and 2020, accounting for approximately 0.001 percent of the External Inventory for the year 2007 and 2020 (unmitigated).

Table A-12. GHG External Emissions from Miscellaneous Sources

Miscellaneous Activity	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)
Residential Fires	17	17
Cooking (charbroiling emissions)	329	414
Total	346	431

Carbon Sinks and Sequestration

Various land covers in San Bernardino County provide sequestration of carbon in vegetation and soils. The amount of carbon in standing vegetation and soils is called the *carbon stock*. The amount of carbon sequestered from the atmosphere annually is called the *carbon flow*, the *GHG flux*, or the *annual sequestration*. The different types of land covers in the County, their carbon stock, and literature values for sequestration values are noted in **Table A-13**.

Data Collection

The focus for the External Inventory is on annual GHG emissions within the County LUA. Conversion of natural and agricultural land to urban uses results in the loss of the annual sequestration value of that land unless the new landcover provides sequestration value of its own. Loss of sequestration of carbon is functionally equivalent to an emission of carbon dioxide. However, data on specific conversion of land by individual land cover was not available to support quantification of land conversion in 2007 to add these emissions to the 2007 inventory. Similarly, data were not available to support a forecast of the potential conversion of carbon sinks between 2007 and 2020.

Emissions Calculations

No forecast of changes in natural carbon sinks was completed due to a lack of forecasted land use change data. The loss of annual sequestration is a cumulative concern in that the loss accumulates as more natural land cover is converted over time. **Table A-13** below presents potential carbon stock and sequestration values to different land covers that occur in San Bernardino County. These numbers are provided for illustrative purposes only and should not be considered a precise accounting of current or projected annual or cumulative losses of sequestration value.

It should be noted that loss of carbon stocks does not necessarily translate into an equivalent emission of carbon dioxide in the same manner as loss of annual carbon sequestration value. For example, when trees are cut and used in building products, the carbon in the wood fiber is still sequestered and is not released to the atmosphere. However, when carbon stock is burned or otherwise degrades, the carbon is released; in comparison to remaining *in situ*, this then represents a one-time release of the carbon dioxide formerly bound up as stock.

Table A-13: Carbon Stocks and Annual Sequestration Values of Different Land Covers

Land Cover	Planning Area	Carbon Stock (t C/Ha)	Annual Sequestration Value (t C/Ha/Year)	Notes
Chaparral, Sage, and Scrub	Valley Mountain	30 ¹	0.01 ²	
Grassland	Valley Mountain	3.5 ¹	0.01 ²	
Riparian Forest	Valley Mountain	NA	0.35 ² – 1.05 ¹	Limited riparian forest in San Bernardino County
Oak Woodlands and Oak Forests	Valley Mountain	26 – 56 ³ (woodlands) 52 – 114 ³ (forests)	0.35 ² – 1.05 ¹	Total estimated stock in San Bernardino County (all areas including incorporated areas and federal land) is ~2.1 million tons carbon on ~53,000 ha. ⁴
Conifer Forests (Ponderosa, Pinon, Juniper)	Mountain Desert	42 – 106 ⁵	0.5 – 3 ⁶	Ponderosa pine forest sequestration peaks at 3 t C/ha/yr after around 65 years and then declines to 0.5 t C/ha/yr at year 155. ⁶
Wetlands	Valley Mountain Desert	363 – 1,470 ²	0.12 – 0.21 ²	Freshwater wetlands can also be a net source of methane that can offset carbon sequestration value. Limited wetland resources in County.
Alkali Sink, Sand Dune	Desert	NA	NA	Given limited/non-existent vegetation, carbon stock and sequestration very limited.
Cultivated Soils	Valley Desert	3 ¹	0.0 ^{1,2} - 0.19 ⁷	Total carbon stock in agricultural lands in San Bernardino County estimated as ~45,000 t/carbon on 15,000 ha ¹ . Does not account for fossil fuel or fertilizer use by agriculture.
Urban Forest	Valley	NA	0.3 ² – 0.8 ⁷	Limited urban forested areas in County.

Notes

¹ CEC 2004a. Sequestration value for riparian forest and oak woodland/forest is value for hardwood forest and may overstate value.

² USCCP 2007. Carbon stock value for wetlands includes soils. Sequestration value for riparian forests, oak woodlands, and oak forests is average value for all forest types.

³ Gaman 2008. Tree values only included. Additional carbon stock and sequestration in understory, duff, debris, and soil.

⁴ Gaman and Firman 2008.

⁵ NCASI 2009. Excludes soil.

⁶ Stavins and Richards 2005. Values are for ponderosa pine forest.

⁷ Kroodma and Fields 2006.

⁸ Forbes and Dakin, no date. Urban forest value is U.S average. San Bernardino value is likely substantially lower due to arid conditions and sparse tree cover in urban areas.

All specific references to the County are for the County as a whole, including cities and federal lands, and are not limited to the unincorporated area.

External Inventory Results Summary

1990 Emissions

The SCAQMD Inventory included an estimated 1990 Countywide inventory, which totaled 2.8 MMTCO₂e. This 1990 inventory was not included in the Internal or External Inventories for the following reasons:

- The County's jurisdictional boundaries have changed significantly since 1990, introducing considerable uncertainty into an estimate of 1990 external emissions that is based on the current jurisdictional boundaries.
- Internal and External emissions estimates for the year 1990 would be difficult to determine with great accuracy since data for energy use, fuel combustion, landfills, and other sources required for GHG analysis were unavailable; therefore, the SCAQMD Inventory 1990 estimate, is based on backcasting from 2002 and subject to a degree of inherent uncertainty.
- Recognizing the inherent uncertainties in estimating a 1990 inventory for local jurisdictions, the CARB Scoping Plan did not recommend that local municipalities adopt a goal of reducing to 1990 emissions levels, but rather recommended that local governments adopt a future reduction goal that reflects a level of approximately 15 percent emissions reductions from current levels for both community (external) and municipal (internal) (CARB 2008).

Given the CARB Scoping Plan recommendation, the GHG Reduction Plan includes a 2007 inventory and 2020 estimate of emissions. As described below, the 2007 inventory is used to determine the reduction goal.

Current (2007) External GHG Emissions

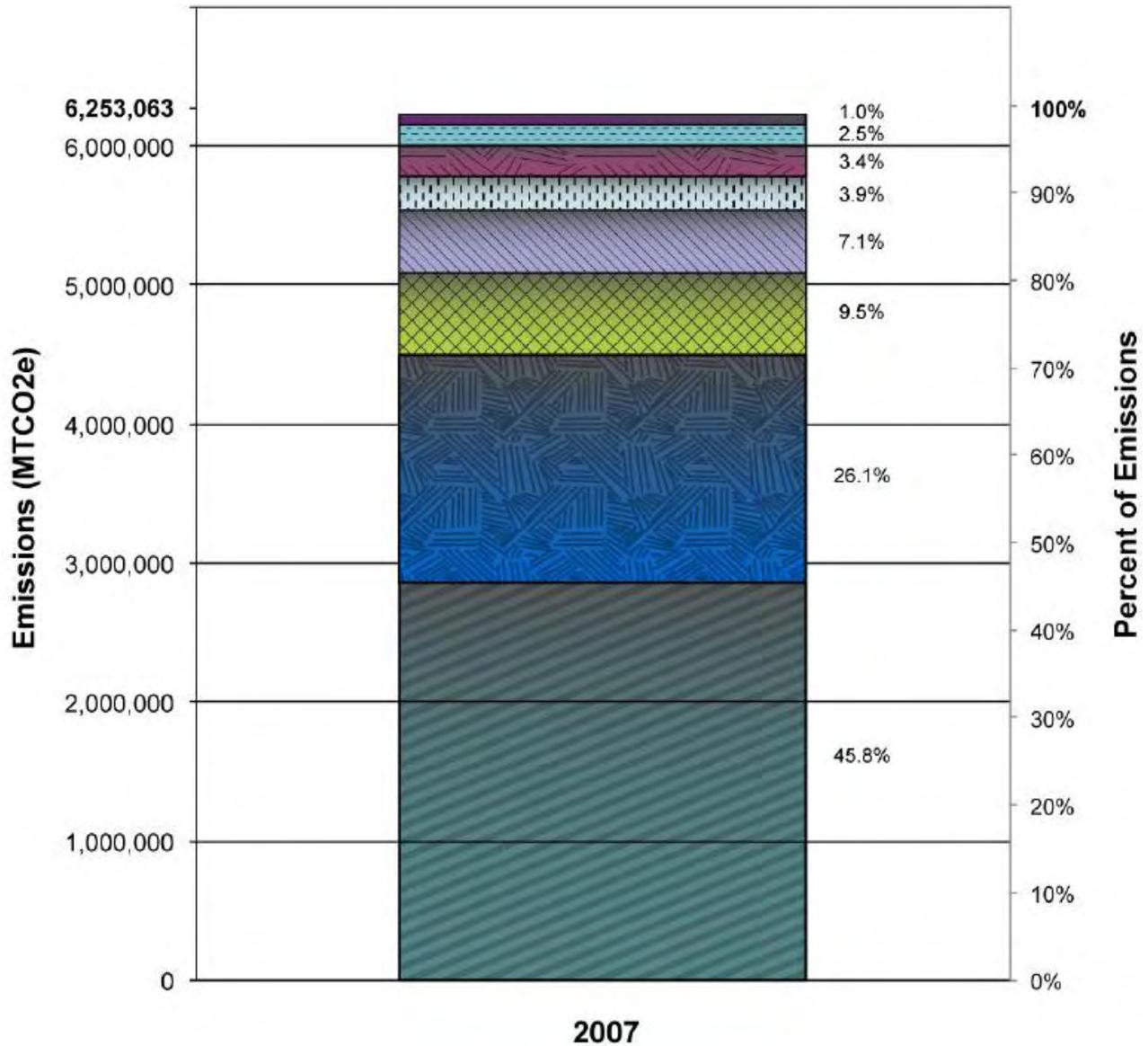
The County's 2007 External Inventory is presented in **Table A-14** by major sector. The largest source of GHG emissions in 2007 is Stationary Source emissions, followed by On-Road Transportation.

The primary source of Stationary Source emissions is cement plants as depicted in **Figure A-2**. The cement plant emissions result from several industrial activities, some of which are under the County's jurisdictional control. There are 11 cement plants located in California, four (4) are located in the County, three (3) of which are located in the County LUA area. These three (3) cement plants represent approximately 30 percent of GHG emissions from cement production in California.

Table A-14. 2007 External Emissions Summary (MTCO₂e)

Sector	2007	
	Emissions	Percent
Stationary Sources	2,866,435	45.8
Transportation: On-road	1,631,666	26.1
Industrial Energy Use	593,716	9.5
Residential Energy Use	440,851	7.1
Commercial Energy Use	246,364	3.9
Landfill waste	213,191	3.4
Transportation: Off-road	157,185	2.5
Agriculture	64,619	1.0
Wastewater	27,994	0.4
Water Conveyance	10,696	0.2
Miscellaneous	346	0.01
Total	6,253,063	100

Figure A-2. 2007 External Emissions by Sector



- Agriculture
- Transportation - Offroad
- Landfill WIP
- Commercial
- Residential
- Industrial
- Transportation - Onroad
- Stationary Sources
- Miscellaneous (not shown: 0.01%)
- Water Conveyance (not shown: 0.2%)
- Wastewater (not shown: 0.4%)

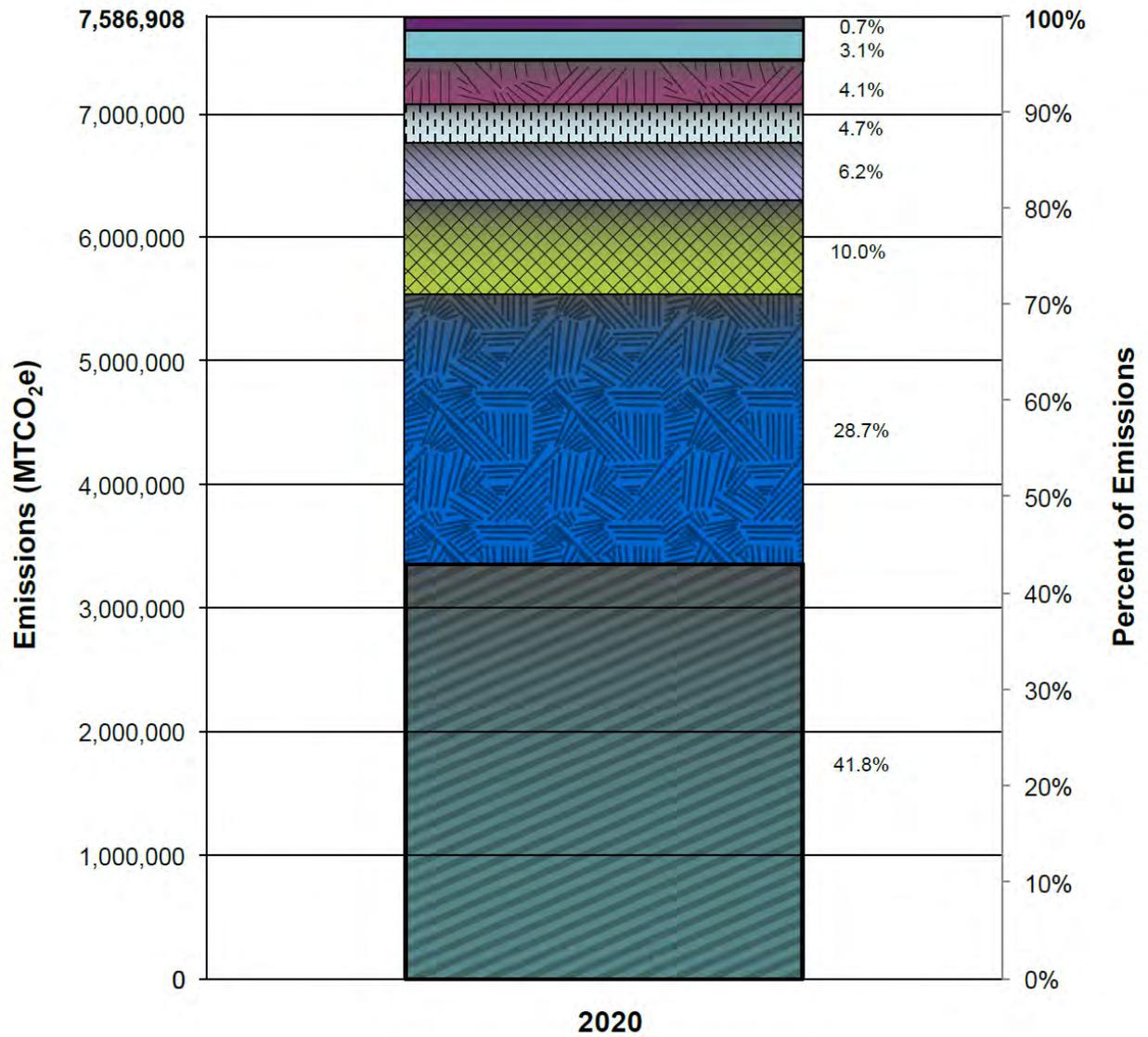
Projected (2020) External GHG Emissions

The 2020 (unmitigated) emissions projections are listed in **Table A-15** and presented in **Figure A-3** below. Projections for 2020 (unmitigated) are based on current emissions, scaled by sector specific growth rates presented in Table 2-1 above.

Table A-15. Projected 2020 Unmitigated External Emissions Summary (MTCO₂e)

Sector	2020	
	Emissions	Percent
Stationary Sources	3,173,592	41.8
Transportation: On-road	2,176,132	28.7
Industrial Energy Use	760,834	10.0
Residential Energy Use	467,217	6.2
Commercial Energy Use	314,603	4.1
Landfill waste	359,318	4.7
Transportation: Off-road	235,054	3.1
Agriculture	50,991	0.7
Wastewater	35,525	0.5
Water Conveyance	13,211	0.2
Miscellaneous	431	0.01
Total	7,586,908	100

Figure A-3. 2020 External Emissions by Sector

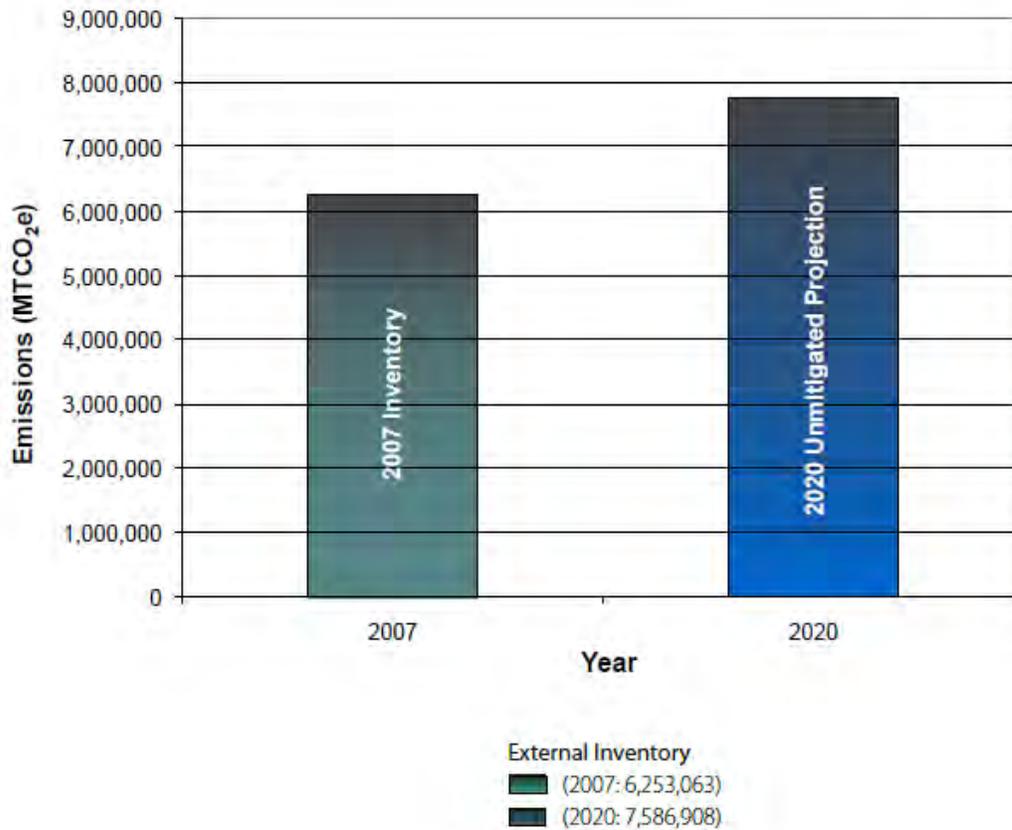


- Agriculture
 - Transportation - Offroad
 - Landfill WIP
 - Commercial
 - Residential
 - Industrial
 - Transportation - Onroad
 - Stationary Sources
- Miscellaneous (not shown: 0.01%)
 Water Conveyance (not shown: 0.2%)
 Wastewater (not shown: 0.5%)

Summary of 2007 and 2020 Unmitigated External Emissions

The County’s external emissions for 2007 and 2020 are 6.3 MMTCO₂e and 7.8 MMTCO₂e, respectively (see **Figure A-4** below). The 2007 GHG unmitigated emissions were calculated based on the most current and comprehensive data available and projected 2020 unmitigated GHG emissions are based on growth factors presented above. These future emissions are not adjusted to reflect recent legislation that will result in statewide GHG emissions reductions.

Figure A-4. External Inventory of GHG Emissions (2007–2020)



Scope 3 External Emissions

The following section discusses the methodology for calculating GHG emissions for Scope 3 sources. Emissions from these sources are reported for informational purposes and are not included in the External Inventory or establishment of the reduction target.

Methane Commitment for Waste Generation

Emissions associated with the “methane commitment” for waste generation within the LUA resulted in 98,504 and 123,424 MTCO₂e in 2007 and 2020, respectively. These emissions are defined as the future landfill methane emissions that result from the current or “active” year’s waste generation. These emissions are reported for informational purposes only and are not included in the inventory since reporting these emissions is considered to be optional (CARB et al. 2008). The “methane commitment” method is based on the USEPA’s Waste Reduction Model (WARM) for calculating lifecycle emissions from waste generation in that it accounts for future emissions from waste generation. The WARM model also addresses other lifecycle emissions such as upstream (i.e., raw material acquisition) emissions and carbon sequestration in landfills that are not included in this analysis. The waste disposal tonnage for all waste generated in the LUA area was obtained from the CIWMB for 2005 through 2007 (CIWMB 2009).

High Global Warming Potential GHGs

These sources of emissions are defined as Scope 3 sources in this inventory due to the County’s limited or non-existing jurisdiction over these sources. In addition, emissions of high global warming potential (GWP) GHGs are not specifically recommended for quantification in regional inventories and their quantification for the External Inventory may include considerable uncertainty.

High-GWP emissions within the LUA area resulted in 160,588 and 390,168 MTCO₂e in 2007 and 2020, respectively. High-GWP gases include SF₆ from electric utility applications, substitutes for ozone depleting substances (primarily hydrofluorocarbons and perfluorocarbons), and other high-GWP gases used in semiconductor manufacturing and other industrial processes.

Emissions of high-GWP GHGs were quantified for two sources:

- Substitutes for ozone depleting substances (ODS), and
- SF₆ emissions from electricity transmission lines.

Emissions from semiconductor manufacturing and specific industrial processes were not included in the inventory because these emissions either do not occur in the County, have negligible emissions, or could not be quantified for this analysis.

County high-GWP GHG emissions for the year 2007 and 2020 (unmitigated) are estimated and presented in **Table A-16** below.

Table A-16. Scope 3 GHG Emissions from High GWP Gases by Source

High GWP Source	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)

Use of Substitutes for ozone depleting Substances	152,502	381,415
SF ₆ Emissions	8,086	8,754
Total	160,588	390,169

HFCs and PFCs as ODS Substitutes

Emissions of HFCs and PFCs occur from their use in refrigeration and air conditioning systems. These high-GWP compounds were phased in as ODS substitutes. The California State-wide per capita emissions of HFCs and PFCs from these applications were used to determine emissions for the County on a population basis, as described for wastewater treatment emissions. The CARB’s projected emissions for 2020 were used to determine a per capita emission rate, which was used to estimate emissions from the County in 2020. The California Department of Finance population projections for the County were used to estimate future emissions. To determine emissions associated with the County’s LUA, total Countywide GHG emissions as calculated above were scaled by the ratio of population in the unincorporated County to the entire County for 2007. This ratio is approximately 0.15.

High-GWP GHG emissions account for approximately 3.5 percent of the County’s total emissions in 2007. Most anthropogenic high-GWP GHGs include SF₆, HFCs, and PFCs. Emissions of high-GWP GHGs were quantified for two major source categories: appliances and electricity transmission lines. In appliances, ODS substitutes required by the Montreal Protocol include HFCs and PFCs. These high-GWP gases are emitted during normal use in appliances such as refrigeration and air conditioning systems, and leakage after disposal. Electricity transmission lines result in emission of SF₆, which is used to ensure the safety of electricity transmission.

Electricity Transmission

Electrical transmission and distribution systems emit SF₆. CARB estimates the California Statewide emissions of SF₆ from electricity transmission and distribution to be constant from 2004 to 2020 (CARB 2009). These emissions were used to estimate SF₆ emissions within the County LUA area, using the same methodology as that described above for ODS substitutes and wastewater treatment emissions.

Rail Emissions

Emissions associated with rail operations and trains were considered Scope 3 emissions and were not included in the External Inventory. Many trains travel through the County but have origins and destinations not located within the unincorporated County. In addition, railroads are not subject to County’s regulatory authority. GHG emissions for rail are based on the SCAQMD Inventory

These emissions within the LUA area resulted in 122,255 and 151,755 MTCO₂e in 2007 and 2020, respectively. These emissions are associated with locomotive fuel combustion. These emissions are reported for informational purposes only and are not included in the inventory because railroads are not subject to the County’s land use authority. GHG emissions for rail are based on the SCAQMD inventory.

Summary of Scope 3 Emissions

Various Scope 3 emission sources were calculated for the External Inventory for informational purposes and are presented in **Table A-17**.

Table A-17. Scope 3 External Emissions Summary

San Bernardino 2007 Scope 3 External Inventory and 2020 Unmitigated Projections (MTCO₂e)				
Sector	2007		2020	
	Emissions	Percent	Emissions	Percent
Methane Commitment for Waste Generation	98,504	25.8	123,424	18.6
High GWP GHGs	160,588	42.1	390,168	58.6
Trains	122,255	32.1	151,755	22.8
Total	381,347	100.0	665,347	100.0

The methane emissions are considered biogenic in the LGOP; therefore, not included in the inventory. High GWP GHGs are not typically included in regional inventories since their quantification is based on state-wide emissions factors regarding a suite of possible sources, and thus scaling those emissions to the regional or local scale likely introduces considerable uncertainty. Additionally, rail emissions were also not included in the External Inventory since many trains travel through the County but have origins and destinations not located within the County LUA area.

Data Gap Analysis and Recommendations for Future Inventories

Data for certain sectors of the External Inventory that was used to calculate overall emissions was in some cases incomplete or could be further refined. Data gaps are expected in initial GHG Inventories; an integral component of an initial inventory is the identification of these gaps to develop more robust inventories in the future. Although the External Inventory is comprehensive, subsequent versions of the inventory may address the data gaps described below.

Several emissions sources require further review as part of a future inventory update, including: stationary sources, on- and off-road transportation, and fugitive emissions for wastewater treatment. These are sources that were either 1) scaled down from County- or State-wide data to match the LUA area or 2) require County-specific information to improve accuracy. Future updates to the baseline emissions inventory should address the following specific recommendations.

Stationary Sources

Stationary source data were obtained from the SCAQMD Inventory as discussed above (except for cement plant data). The SCAQMD Inventory scaled Countywide stationary source emissions by population to determine emissions associated with the LUA area. This approach is based on the assumption that stationary sources can be reasonably approximated with population. This is not necessarily the case, because various commercial and industrial fuel combustion and other stationary source emissions activities may not be equally represented in the incorporated and unincorporated portions of the County based on population.

Stationary source data, including fuel combustion for residential, commercial, and industrial activities, should be obtained specifically for the unincorporated County. This will require greater coordination between stationary source facilities, the County, and the SCAQMD, and better tracking systems for residential fuel combustion quantities.

Transportation: On- and Off-road

On- and off-road emissions were estimated based on EMFAC and OFFROAD modeling performed in the SCAQMD Inventory. The SCAQMD Inventory scaled Countywide on- and off-road emissions by population to determine emissions associated with the LUA. On- and off-road emissions were apportioned by population to the LUA area because activity data are not readily available on a scale smaller than the County as a whole. Area-specific data for on- and off-road activity are required to estimate more precise emissions from on-road vehicles and off-road equipment.

More precise on-road data specific to the County's LUA could be obtained through the Southern California Association of Governments (SCAG) regional transportation modeling. SCAG's model data included VMT by vehicle type based on origins and destinations, and general trip purpose. This data could be used to estimate VMT originating, traveling through, and ending up within the County's LUA area. This analysis would provide a more accurate picture of VMT for the External Inventory than scaling by population, and would facilitate more effective design of transportation reduction measures. More precise off-road emissions estimates could be prepared using activity-based fuel consumption data specific to the County's LUA area. The OFFROAD model

does not currently have this capability. Improving the on- and off-road emissions estimates will require greater coordination between SCAG, the County, and the SCAQMD.

Wastewater Treatment

Emissions from domestic wastewater treatment and discharge were based on per capita State-wide averages because data regarding local wastewater treatment processes and emissions was not readily available. This approach is based on the assumption that fugitive wastewater treatment emissions can be reasonably approximated with population. This is not necessarily the case, because various wastewater treatment processes throughout the State produce different per-capita fugitive GHG emissions.

Area-specific data on wastewater treatment plants in San Bernardino County is required to estimate more precise emissions from these plants. Obtaining these data may be time consuming and cost prohibitive, however, unless reporting procedures are initiated to facilitate data collection. This will require greater coordination between wastewater treatment facilities, the County, and the SCAQMD, and better tracking systems for wastewater treatment processes.

Methodology for Estimating External Reduction Measures GHG Effectiveness

Introduction

The GHG Reduction Plan relies on a multiple sector multiple measure approach to support reduction of GHG emissions in the County. Both state and local emission reduction measures are taken into account. For the local measures, the County has identified a variety of reduction approaches and strategies including mandatory measures, incentive-based measures, a Development Review Process, outreach, education, and regional cooperation.

This section provides information on calculations of GHG emissions reductions for the following sectors in the County's GHG Reduction Plan for the External Inventory: residential, commercial, and industrial energy use; Transportation (on-road and off-road) and Land Use; Solid Waste Management; industrial fuel combustion; Agriculture; and Water Conservation. External emission reductions are defined in relation to the 2020 unmitigated emissions level for the County's LUA area. In the text that follows, LUA area and "External" are used interchangeably to describe emissions from sources in or associated with the unincorporated County.

Emission reductions for the R1 measures were based on CARB methodology, as presented in the AB 32 Scoping Plan. In certain cases, CARB's calculations were modified to better estimate reductions for the unincorporated County, as described below. R2 measures were calculated using County-specific assumptions, where available, and custom methodologies for each sector of emission reductions presented below. The reduction methodologies for each emissions sector are based on a combination of widely accepted protocols established by USEPA, CCAR, CARB, and other relevant protocols, as appropriate, or on scientific studies. The following section presents the major assumptions and calculation methodologies used to estimate emission reductions for the GHG Reduction Plan.

Development Review Process

For existing development, the GHG Reduction Plan relies on state measures that are mandatory and local measures that are primarily incentives-based. In some cases, the County and other agencies will be implementing state mandates, such as for urban water use efficiency through regional cooperation and incentives and other measures for existing development.

In the aggregate, new development, subject to County discretionary permit authority, will reduce emissions by 31 percent compared to unmitigated conditions through the County's Development Review Process (DRP). With this 31 percent GHG reduction and the GHG reduction effectiveness of all other measures in the GHG Reduction Plan, the County will reach its reduction target. The County will develop a screening table with a point system that takes into account a wide range of potential measures that new development could implement in order to achieve the overall 31 percent reduction level (Screening Table)⁷. The state measures and mandatory local measures (such as water conservation requirements) and other local action (such

⁷ The Screening Table attached as Appendix F to the GHG Reduction Plan is substantially similar to the Screening Table that will be utilized by the County.

as the County's municipal waste measures) will be included in the Screening Table such that where these measures apply to a specific development; they can be counted toward the 31 percent requirement. The County's Screening Table will be based on a 100 point system that corresponds to a 31 percent reduction in GHG emissions.

Beyond the state measures and the mandatory local measures, the County intends to leave the specific choice of reduction measures to the individual project proponent to facilitate the adoption of the most feasible, effective, and cost efficient measures relevant to each specific project. Through the County's Development Review Process each new project will be reviewed in order to assure that the identified measures are feasible, relevant to the project, committed to by the proponent, funded, and have a definite schedule for their implementation. Using this approach, the precise amount of GHG emissions reductions cannot be estimated for new development on a measure by measure basis. Rather, the analysis examined feasible scenarios of reductions that would result from new development utilizing different reduction strategies relating to energy efficiency, and alternative energy features.

The County will monitor the emissions reductions from new development, calculate those emissions and make any needed modifications to the County's reduction strategies to enable the County to reach its 2020 target.

Residential projects (or mixed use projects with a residential component) of 250 dwelling units or greater that are located in unincorporated area not within a City Sphere of Influence will not be eligible to use the Screening Table. Residential Projects outside of a City Sphere of Influence must perform an independent project-specific evaluation of GHG emissions as described below. (See Appendix F for a full description of the limitations and uses of the Screening Tables)

Residential Projects of 250 dwelling units or greater that are located outside of a City Sphere of Influence will be required to prepare a project specific GHG emissions analysis that includes a robust assessment of emissions, appropriate mitigation measures, and the issues associated with land use intensification and VMT generation on a project and regional basis. The analysis must produce an assessment that allows for a determination of whether the specific project causes cumulatively considerable GHG impacts. Residential Projects of 250 dwelling units or greater that are located outside of a City Sphere of Influence will not qualify for the tiering and streamlining benefits otherwise provided by this Plan as allowed by CEQA Guidelines Section 15183.5 due to the inability to adequately analyze and incorporate programmatic mitigation that comprehensively addresses the issues of GHG emissions regionally significant residential projects beyond the 2020 analysis horizon. It is anticipated that upon completion of the Sustainable Communities Strategy (SCS) by Southern California Association of Governments (SCAG) and the Regional GHG Reduction Plan currently under preparation by the San Bernardino County Association of Governments (SANBAG), adequate methodology for quantification of regional VMT and more comprehensive mitigation will provide suitable planning tools that can be incorporated into this Plan through a future amendment. Both the SCS and the Regional GHG Reduction Plan are intended to satisfy the requirements of SB 375 and allow better forecasts of GHG emissions to 2035 as well as providing a regional strategy for reducing GHG emissions.

Building Energy Reduction Measures

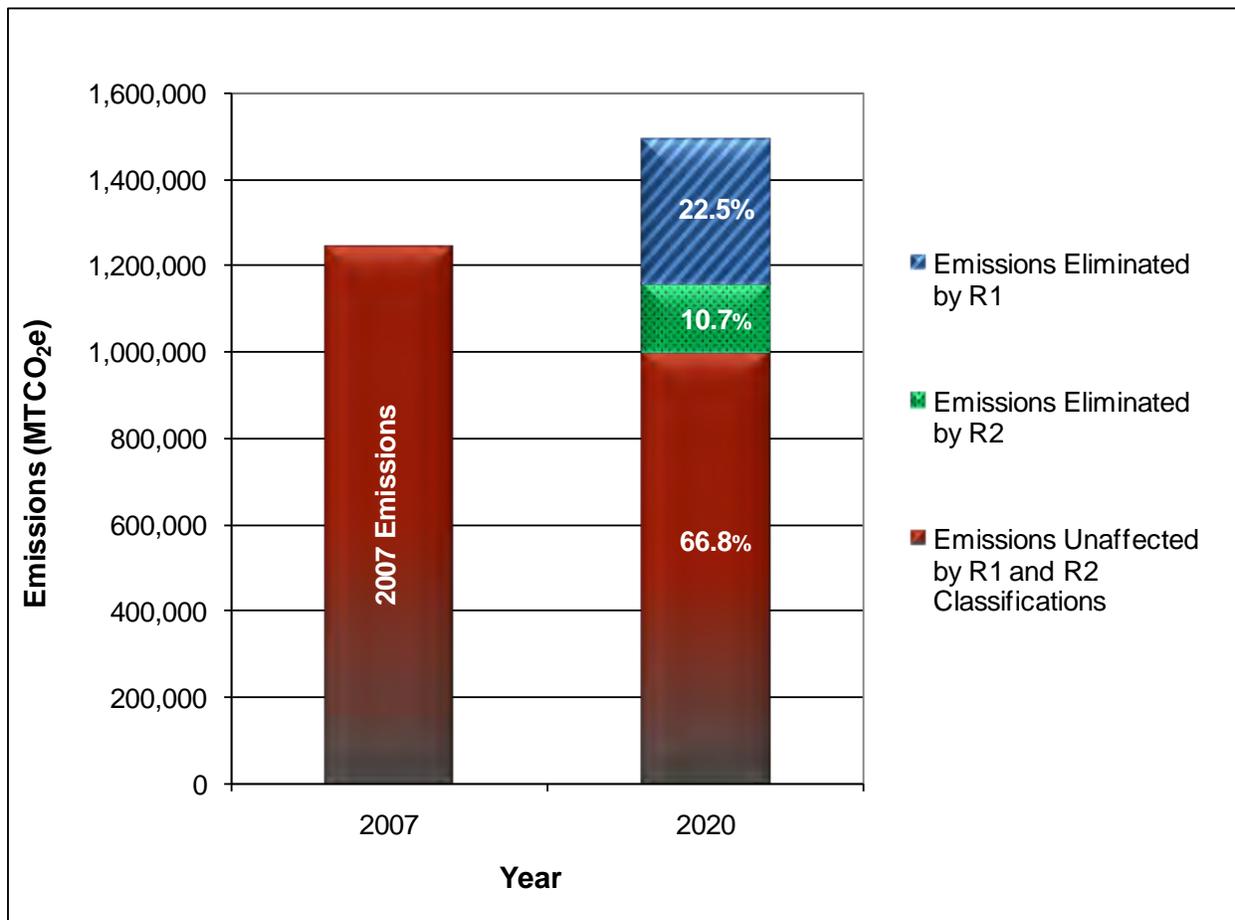
This section provides information on calculations of GHG emission reductions attributable to R1 and R2 measures for building energy use for the County. Total estimated GHG percent reductions and quantities from the reduction measures included in Reduction Scenarios R1 and R2 are presented below in **Table A-18**. Emission reductions for each measure are applied to the 2020 unmitigated projected emissions for the appropriate emission quantity affected by that measure. Reductions attributed to these measures from the 2020 unmitigated building energy use emissions will be 27 percent by year 2020. .

Table A-18: External GHG Emission Reductions from Building Energy Measures

Reduction Classification and Reduction Measure	GHG reductions	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional building energy measures that do not require County action		
RE1B: RPS – 33 percent by 2020	104,236	7.0
R1E2: AB 1109 Residential Lighting	23,473	1.6
R1E3: AB 1109 Commercial/Outdoor Lighting	14,814	1.0
R1E4: Electricity Energy Efficiency (AB 32)	106,925	7.2
R1E5: Natural Gas Energy Efficiency (AB 32)	9,429	0.6
R1E6: Increased Combined Heat and Power (AB 32)	63,881	4.3
R1E7: Industrial Efficiency Measures (AB 32)	12,488	0.8
R2: Existing and new building energy measures that require County action		
R2E1: Residential Energy Efficiency Retrofits	17,350	1.2
R2E2: Commercial Energy Efficiency Retrofits	8,540	0.6
R2E3: Residential Retrofit Renewable Energy Incentives	21,351	1.4
R2E4: Warehouse Renewable Energy Incentive Program	6,786	0.5
R2E5: Solar Hot Water Incentives	11,907	0.8
R2E6: New Residential Energy Efficiency (through DRP)	9,460	0.6
R2E7: New Commercial Energy Efficiency (through DRP)	35,342	2.4
R2E8: New Home Renewable Energy (through DRP)	2,239	0.2
R2E9: New Commercial/Industrial Renewable Energy (through DRP)	25,392	1.7
R2E10: Commercial/Industrial Rehabilitation/Expansion Renewable Energy (through DRP)	21,086	1.4
Total	494,699	33.3
R3: Existing and new building energy measures—reductions not quantified or relied upon to achieve reduction goal		
R3E1: Green Building Development Facilitation and Streamlining		
R3E2: Green Building Training		
R3E3: Community Building Energy Efficiency & Conservation for Existing Buildings		
R3E4: Energy Efficiency Financing		
R3E5: Heat Island Mitigation Plan		

Reduction Classification and Reduction Measure	GHG reductions	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R3E6: Public Education		
R3E7: Cross-Jurisdictional Coordination		
R3E8: Community Alternative Energy Development Plan		
R3E9: Support Utility-Scale Renewable Energy Siting and Transmission Lines		
R3E10: Identify and Resolve Potential Barriers to Renewable Energy Deployment		
R3E11: Solar Ready Buildings Promotion		
R3E12: Renewable Energy Financing		
R3E13: Regional Renewable Energy Collaboration		
R3E14: Accessory Wind Systems		
R3E15: Off-Site Mitigation of GHG Impacts for New Development		

Figure A-5. External Inventory GHG Emission Reductions from Building Energy Measures



With the implementation of the emission reduction measures included in this Plan, the County will reduce building energy emissions by 33 percent from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately 20 percent lower than 2007 emissions.

R1 Building Energy Reduction Measures

This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* national, state, or regional measures that do not require significant County action and will result in future GHG reductions associated with building energy usage within the County LUA.

R1E1A and R1E1B: Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires State agencies to take all appropriate actions to ensure the target is met. The 33 percent RPS by 2020 goal is supported by the California Air Resources Board (CARB), though its feasibility is not certain due to current limitations in production and transmission of renewable energy. Therefore, both RPS goals in 2020 were examined: 20 percent (Reduction Measure R1E1A) and 33 percent (Reduction Measure R1E1B).

SCE is the primary electric utility in the County accounting for 97 percent of electricity provided to the County's LUJ⁸. Because SBC provides the vast majority of power for the region, it was assumed that SCE generation characteristics were adequate to characterize the energy in the totality of the SBC region. This approach obviated the need to analyze the generation characteristics of the lesser energy area providers. SCE's 2007 level of renewable generation (as a percentage of its total portfolio) was approximately 15.8 percent.

Emissions reductions associated with RPS (both the 20 percent and 33 percent RPS goals) were determined by calculating the increase in renewable energy production from SCE's 2007 production level for both R1E1A and R1E1B reduction measures. These increases in renewable energy production result in a GHG emission reduction for electricity within the LUA of five (5) percent (Reduction Measure R1E1A) and 20.4 percent (Reduction Measure R1E1B). All renewable energy sources were assumed to be carbon neutral.⁹

In accordance with CARB protocol in the AB 32 Scoping Plan, reductions from R1 and R2 energy efficiency and renewable energy measures presented below (as applied electricity emissions only) were subtracted from the 2020 unmitigated emissions before applying the RPS (R1E1A, R1E1B) reduction¹⁰. This method avoids double counting of emissions reductions.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Increasing the SCE's renewable portfolio from 15.8 percent to 33 percent results in a decrease in GHG emissions of 20.4 percent.
- Measures R1E2-R1E6 have been implemented.

⁸ As detailed in the External Inventory.

⁹ California Air Resources Board, 2008, pp. 44-46.

¹⁰ California Air Resources Board, 2008a, pp. I-29-30.

This measure would result in a 7.0 percent reduction from total 2020 unmitigated building sector emissions.

R1E2 and R1E3: AB1109 Energy Efficiency Standards for Lighting (Residential and Commercial Indoor and Outdoor Lighting)

Assembly Bill (AB1109) mandated that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other State efforts, shall be structured to reduce State-wide electricity consumption in the following ways:

- R1E2: At least 50 percent reduction from 2007 levels for indoor residential lighting by 2018.
- R1E3: At least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The percent electricity use from residential lighting is 20 percent, consistent with a report from the California Energy Commission¹¹.
- The percent electricity use from commercial lighting is 37.14 percent. This percentage is calculated by dividing the emissions from commercial lighting by the total commercial electricity-based emissions in the County's 2007 inventory.
- There was no data available for outdoor industrial lighting use and therefore calculating reductions in outdoor industrial lighting due to AB1109 was not feasible.

Measure R1E2 would result in a ten (10) percent reduction from 2020 unmitigated residential electricity emissions, or a 1.6 percent reduction from total 2020 unmitigated building sector emissions. Measure R1E3 would result in a 9.3 percent reduction from 2020 unmitigated commercial electricity emissions, or a 1.0 percent reduction from total 2020 unmitigated building sector emissions.

R1E4: Electricity Energy Efficiency (AB32)

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report¹². This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"). This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid)
- Broader standards for new types of appliances and for water efficiency

¹¹ California Energy Commission, 2004.

¹² California Air Resources Board, 2008b.

- Improved compliance and enforcement of existing standards
- Voluntary efficiency and green building targets beyond mandatory codes
- Voluntary and mandatory whole-building retrofits for existing buildings
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation
- More aggressive utility programs to achieve long-term savings
- Water system and water use efficiency and conservation measures
- Additional industrial and agricultural efficiency initiatives
- Providing real time energy information technologies to help consumers conserve and optimize energy performance

By 2020, this requirement will reduce emissions in California by approximately 21.3 MMTCO₂e, representing 17.5 percent of emissions from all electricity in the State¹³.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The percent reduction of the State's emissions from the various energy efficiency measures listed above is equal to the percent reduction of the County's emissions from this measure (17.5 percent).
- The measure includes Title 24 Energy Efficiency Standards updates and energy efficiency retrofits. The County's R2 measures relating to these strategies has been subtracted out to avoid double counting.
- If the County's R2 measures that reduce electricity-related emissions through energy efficiency exceed the magnitude of measure R1E4, then measure R1E4 will have no reduction. If this was the case, then the County is actually going beyond what the State requires.
- Measures R2E1 and R2E2 have been implemented and energy emission reductions from the Development Review Process will approximate the estimated reductions from measures R2E6 and R2E7¹⁴.

The reduction in unmitigated emissions attributed to the AB 32 measure was calculated by applying the percent reduction from California's emissions related to electricity generation (17.5 percent) calculated in the Scoping Plan to the San Bernardino County emissions from electricity use.

This measure would result in a 7.2 percent reduction from total 2020 unmitigated building sector emissions.

R1E5: Natural Gas Energy Efficiency (AB32)

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2

¹³ California Air Resources Board 2008a, 2009a.

¹⁴ Some of the proposed strategies listed above are included in the R2 measures described below; to avoid double counting, emission reductions (related to electricity) from all R2 energy efficiency measures (R2E1-R2E4) were subtracted from the emission reduction calculated by multiplying the electricity-based emissions by 17.5 percent.

reductions, as described in this report¹⁵. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"). This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid)
- Broader standards for new types of appliances and for water efficiency
- Improved compliance and enforcement of existing standards
- Voluntary efficiency and green building targets beyond mandatory codes
- Voluntary and mandatory whole-building retrofits for existing buildings
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation
- More aggressive utility programs to achieve long-term savings
- Water system and water use efficiency and conservation measures
- Additional industrial and agricultural efficiency initiatives
- Providing real time energy information technologies to help consumers conserve and optimize energy performance
- By 2020, this requirement will reduce emissions in California by approximately 4.3 MMTCO₂e, representing 6.2 percent of emissions from all natural gas combustion in the State¹⁶.
- The following assumptions were used to calculate emission reductions attributed to this measure:
 - The percent reduction of the State's emissions from the various energy efficiency measures listed above is equal to the percent reduction of the County's emissions from this measure (6.2 percent).
 - The measure includes Title 24 Energy Efficiency Standards updates and energy efficiency retrofits. The County's R2 measures relating to these strategies has been subtracted out to avoid double counting.
 - If the County's R2 measures that reduce natural gas emissions through energy efficiency exceed the magnitude of measure R1E5, then measure R1E5 will have no reduction. In this case the County is actually going beyond what the State requires.
 - Measures R2E1 and R2E2 have been implemented and energy emission reductions from the Development Review Process will approximate the estimated reductions from measures R2E6 and R2E7.

¹⁵ California Air Resources Board, 2008b.

¹⁶ California Air Resources Board 2008a, 2009a.

This measure would result in a 0.6 percent reduction from total 2020 unmitigated building sector emissions.

R1E6: Increased Combined Heat and Power (AB32)

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 GWh State-wide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible CHP portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. By 2020, this requirement will reduce emissions in California by approximately 6.7 MMTCO₂e, representing 7.6 percent of emissions from all electricity in the State.¹⁷

The following assumptions were used to calculate emission reductions attributed to this measure:

- The percent reduction of the State's emissions from increased combined heat and power is equal to the percent reduction of the County's emissions from this measure (7.6 percent).

This measure would result in a 4.3 percent reduction in total 2020 unmitigated building sector emissions.

R1E7: Industrial Efficiency Measures (AB32)

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB32 Scoping Plan.

By 2020, this requirement will reduce emissions in California by approximately 1.0 MMTCO₂e, representing 3.9 percent of emissions from all industrial natural gas combustion in the State¹⁸.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The percent reduction of the State's emissions from industrial efficiency measures is equal to the percent reduction of the County's industrial emissions from this measure (3.9 percent).

This measure would result in a 3.9 percent reduction from 2020 unmitigated industrial natural gas emissions, or a 0.8 percent reduction in total 2020 unmitigated building sector emissions.

R2 Building Energy Reduction Measures

This section describes the methodology used to calculate GHG emission reductions for the R2 measures that have been implemented or will be implemented by the County resulting in quantifiable GHG reductions for residential, commercial, or industrial building energy usage.

Each measure accounts for emission reductions achieved with R1 Building Energy measures and any preceding R2 Building Energy measures, thereby eliminating any potential double counting of emission reductions. For example the reductions due to the state Title 24 Energy Efficiency Standards were subtracted from 2020 unmitigated emissions before analyzing the effects of the proposed measures below.

¹⁷ California Air Resources Board 2008a, 2009a.

¹⁸ California Air Resources Board 2008a, 2009a.

As discussed above, the County will also be implementing the DRP that will result in a total reduction of 31 percent of those emissions attributable to the new development that occurs within the County's LUA area, compared to projected 2020 unmitigated emissions. The County's approach will not mandate that new development implement specific energy efficiency features beyond the State's Title 24 or renewable energy measures in order to meet the 31 percent requirement, but it is likely that many new development projects will select these features to achieve their reductions given that they are feasible using current technology and are under the direct control of a project proponent. For purposes of this analysis, Measures R2E6, R2E7, R2E8, R2E9, and R2E10, or their equivalent (in terms of energy savings and GHG emission reductions, are collectively referred to as "DRP Measures"), are assumed to be implemented as part of the Development Review Process. The County is not mandating a specific level of energy efficiency; however, to calculate emission reductions specific assumptions were assumed for each DRP Measures as described below. Many of the DRP Measures, including the specific assumptions used to calculate emissions are feasible and highly cost-effective. Consequently, it is likely that new development will meet or exceed the level of energy efficiency predicted below. These actions would occur *in addition to* all other Building/Energy reduction measures presented in the Building/Energy sector.

GHG emission reductions for the majority of the following measures are estimated based on their estimated energy savings. A description of each measure is followed by the resulting GHG reductions.

R2E1: Residential Energy Efficiency Retrofits

This measure involves a County program for residential energy efficient retrofits. Retrofits would include various energy efficiency upgrades, including improvements to HVAC systems, water heating systems, or the building envelope (windows/insulation). This measure will be implemented through a combination of County permitting for major renovations and incentives for homeowners to voluntarily retrofit their properties. The incentives will include financing mechanisms, such as AB 811 type programs¹⁹, grants - such as Energy Efficiency Conservation Block Grant funding, and, the County's Green County program, for waiving permit fees. The County will also increase community awareness of retrofit potential, engage in efforts to encourage a qualified retrofit workforce and remove regulatory and procedural barriers, if any, to implementing green building practices.

Improving energy efficiency by 15 percent may be achieved through a menu of options including, but not limited to, the following.

- Replace old, inefficient appliances with new, more efficient ones.
- Replace inefficient air conditioning and heating units with more efficient ones.
- Replace old, inefficient insulation and windows with new, efficient insulation and top-quality and insulating windows.
- Install solar panels and solar water heaters.
- Replace inefficient and incandescent lighting with compact fluorescent and LED lighting.

¹⁹ AB 811 financing programs for residential retrofits are currently impracticable due to Fannie Mae and Freddie Mac mortgage constraints. However, if these constraints are removed, then the County intends to create an AB 811 program, likely in concert with a regional or state-wide group of municipalities, for residential retrofits.

- Weatherize existing buildings to improve energy efficiency.

The amount of residences retrofit by 2020 was estimated based on the methodology of the *Green Building in North America* report from the Commission for Environmental Cooperation²⁰. This report examined a “Deep Green” scenario: an aggressive yet technically achievable retrofit scenario based on a “defensible, robust modeling platform.” In this scenario 90 percent of the existing residential buildings in 2005 undergo a retrofit or major renovation by 2030. Using a linear regression to determine their retrofit rate, and then applying this rate to the County’s timespan (2007 to 2020), determines that 47 percent of residential buildings will be retrofit by 2020. Because this measure is voluntary, a reduced penetration rate was also incorporated into the calculation, reducing the percent of residential buildings retrofit from 47 to 20 percent.

- Twenty (20) percent of residential dwellings existing in 2007 will be retrofit or renovated by 2020.
- All residential buildings affected by this measure would be 20 percent more energy efficient, resulting in a 20 percent decrease in energy use and associated GHG emissions.

This measure would result in a 1.2 percent reduction in total 2020 unmitigated building sector emissions.

R2E2: Commercial Energy Efficiency Retrofits

This measure involves a program for commercial energy efficient retrofits. Retrofits would include various energy efficiency upgrades, including improvements to HVAC systems, water heating systems, or the building envelope (windows/insulation). This measure will be implemented through a combination of County permitting for major renovations and incentives for building owners to voluntarily retrofit their commercial properties. The incentives will include the availability of financing mechanisms, such as an AB 811 type program²¹ and Energy Efficiency Conservation Block Grant funding, and the County’s Green County program for waiving permit fees. The County will also increase community awareness of retrofit potential, engage in efforts to encourage a qualified retrofit workforce and remove regulatory and procedural barriers, if any, to implementing green building practices.

Improving energy efficiency may be achieved through a menu of options including, but not limited to, the options listed under measure R2E1 above.

The amount of commercial buildings retrofit by 2020 was estimated based on the methodology of the *Green Building in North America* report from the Commission for Environmental Cooperation²². This report examined a “Deep Green” scenario: an aggressive yet technically achievable retrofit scenario based on a “defensible, robust modeling platform.” In this scenario 90 percent of the existing commercial buildings in 2005 undergo a retrofit or major renovation by 2030. Using a linear regression to determine their retrofit rate, and then applying this rate to the County’s timespan (2007 to 2020), determines that 47 percent of commercial buildings will be retrofit by 2020. Because this measure is voluntary, a reduced penetration rate was also incorporated into the calculation, reducing the percent of residential buildings retrofit from 47 to 20 percent.

²⁰ Commission for Environmental Cooperation 2008.

²¹ Current mortgage constraints with Fannie Mae/ Freddie Mac do not apply to commercial mortgages. As such, the County can pursue establishment of an AB 811-type program upon program adoption.

²² Commission for Environmental Cooperation 2008.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Twenty (20) percent of commercial buildings existing in 2007 will be retrofit or renovated by 2020.
- All commercial buildings affected by this measure would be 20 percent more energy efficient, resulting in a 20 percent decrease in energy use and associated GHG emissions.
- This measure would result in a 0.6 percent reduction in total 2020 unmitigated building sector emissions.

R2E3: Residential Retrofit Renewable Energy Incentives

This measure involves the installation of solar photovoltaic panels, during a retrofit or major renovation of residential dwellings. The retrofit rate for residential buildings was determined using the *Green Building in North America* methodology, as described above for measure R2E1. Incentives are available to homeowners through the California Energy Commission's California Solar Initiative; new incentives would come from renewable energy financing (see discussion of R3E12 below). The County's incentives to a building owner who voluntarily retrofits his building will also include: the availability of financing mechanisms, such as an AB 811 type program²³ and Energy Efficiency Conservation Block Grant funding; incentives from the CEC's Solar Initiative, possible partnership with Southern California Edison and the CPUC, and the County's Green County program, for waiving permit fees. The County will also increase community awareness of retrofit potential, engage in efforts to encourage a qualified retrofit workforce and remove regulatory and procedural barriers, if any, to implementing green building practices.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Twenty (20) percent of residential dwellings existing in 2007 will be retrofit or renovated by 2020.
- Solar energy would reduce the homes projected electricity use by 51 percent.
- Energy emission reductions from the Development Review Process occur consistent with the estimates for strategy R2E6.
- This measure would result in a 1.4 percent reduction in total 2020 unmitigated building sector emissions.

R2E4: Warehouse Renewable Energy Incentive Program

The County will promote and encourage participation in an incentive program, for installation of solar photovoltaic panels on new warehouse development projects. Possible approaches to the incentive program include developing a partnership between Southern California Edison and California Public Utilities Commission, or establishing a separate program through leveraging other private or public funding sources.

This program would require that the solar photovoltaic panels offset at least 50 percent of a warehouse's electricity use.

The following assumptions were used to calculate emission reductions attributed to this measure:

²³ Assuming mortgage financing constraints can be overcome.

- This measure would only affect emissions from commercial warehouse space electricity use. Based on CBECS warehousing data, this was calculated to be 40 percent of the County's external electricity emissions associated with buildings²⁴.
- Twenty-five (25) percent of unmitigated 2020 emissions from commercial warehousing would be affected by this program.
- Installation of solar photovoltaic panels will offset 50 percent of a warehouse's electricity use.
- Reductions consistent with that estimated for strategy R2E7 and measure R2E2 have been implemented.

This program would result in a 0.5 percent reduction in total 2020 unmitigated building sector emissions.

R2E5: Solar Hot Water Incentives

The County will encourage participation in the California Solar Initiative (CSI) Thermal Program established in January 2010 by the California Public Utilities Commission to provide incentives for the installation of solar water heating systems in new and existing homes and business in the territories of Southern California Edison, Southern California Gas Company, and Pacific Gas and Electric Company. In accordance with AB 1470, the statewide incentive program to encourage the installation of 200,000 solar water-heating systems will run through 2017, or until the program funds are exhausted. The County will facilitate participation in this program by providing access to information about the program and waiving permit fees.

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would affect all emissions from water heating. However, industrial water heating emissions were not included in this measure due to the lack of a detailed breakdown of emissions by energy usage (e.g., heating, lighting, water heating, etc.) for industrial emissions.
- It was assumed that 20 percent of unmitigated 2020 emissions from water heating would be affected by this program. This should be considered a somewhat conservative estimate; the actual percentage may be higher depending on how successful the measure proves.
- Solar water heating saves, on average, 50 to 80 percent of the energy required for water heating²⁵. For this analysis, it was assumed that this measure would save 65 percent of energy used for water heating.
- Measure R2E1/R2E2 have been implemented and energy emission reductions from the Development Review Process will approximate the estimated reductions from strategy R2E6 and R2E7.

This measure would result in a 0.8 percent reduction in total 2020 unmitigated building sector emissions.

²⁴ Energy Information Administration 2003.

²⁵ U.S. Department of Energy, 2009.

R2E6: Residential Energy Efficiency for New Development (through DRP)

This measure involves mitigation of GHG emissions through the County's Development Review Process (DRP) with the incorporation of energy efficient features in new residential construction. Through the DRP, GHG emissions from new development in the County will be reduced by 31% as compared to 2020 unmitigated emission projections. Since Energy efficiency improvements are one of the most cost-effective methods for new development to achieve GHG emissions reductions, it is expected that energy efficient features will be utilized as a common strategy to achieve the required reductions. A combination of options could be used such as energy efficient appliances, lighting, and HVAC systems; building siting and orientation; energy efficiency windows and insulation; natural shading, skylights, and reflective surfaces. Additional emissions reductions can be achieved through solar panels or solar water heaters beyond what is discussed below under R2E8 and R2E5.

The 2008 Title 24 Energy Efficiency Standards are, according to an estimate from the CEC²⁶, approximately 17 percent more stringent for residential buildings than the 2005 standards. The Big Bold Strategies of the California Energy Efficiency Strategic Plan suggest a target of reaching zero net energy (ZNE) for residential buildings by 2020. Although the California Public Utilities Commission (CPUC) does not detail how this will be possible, the continued increase in stringency of Title 24 Energy Efficiency Standards is said to be of paramount importance towards reaching this goal. The CARB Scoping Plan defines one of the State strategies is to update the Title 24 standards triennially to support this goal.

The following assumptions were used to calculate potential emission reductions:

- All additional building emissions in future years are due to new buildings.
- Energy efficient design, equivalent to 15 percent in excess of the 2008 Title 24 Energy Efficiency Standards, would be implemented for new residential buildings. Fifteen (15) percent is the minimum requirement for several well known programs, including: LEED for Homes, ENERGY STAR, and utility rebate programs.
- Energy efficient designs are assumed to improve 17 percent triennially in 2011, 2014 and 2017.
- New buildings were assigned to the following five groups based on the date of the code under which they are/will be permitted: 2005, 2008, 2011, 2014, and 2017. By creating an average of various increases in stringency in relation to the 2005 standards, it is possible to develop a metric that represents the average reduction due to increases in energy efficiency between 2007 and 2020.

These reductions may be achieved through a menu of options including, but not limited to, the following actions:

- Install energy efficient appliances (such as Energy Star), including dishwashers, water heaters, air conditioning units, heating units, etc.
- Install energy efficient lighting.
- Install solar panels and solar water heaters.

26 Personal communication with the California Energy Commission 2008.

- Site and orient buildings to optimize conditions for natural heating, cooling, and lighting.
- Install top-quality windows and insulation.
- Incorporate natural ventilation in new building design.
- Incorporate natural shading, skylights, and reflective surfaces in new building design.

This measure would result in a 0.5 percent reduction in total 2020 unmitigated building sector emissions.

R2E7: Commercial Energy Efficiency

This measure involves mitigation of GHG emissions through the County's Development Review Process (DRP) with incorporation of energy efficient features in new commercial construction. Through the DRP, GHG emissions from new development in the County will be reduced by 31% as compared to 2020 unmitigated emission projections. Since Energy efficiency improvements are one of the most cost-effective methods for new development to achieve GHG emissions reductions, it is expected that energy efficient features will be utilized as a common strategy to achieve the required reductions.

The 2008 Title 24 Energy Efficiency Standards are, according to an estimate from the CEC²⁷, approximately seven (7) percent more stringent for non-residential buildings than the 2005 standards. The Big Bold Strategies of the California Energy Efficiency Strategic Plan suggest a target of reaching zero net energy (ZNE) for all new commercial buildings by 2030.

The following assumptions were used to calculate emission reductions attributed to this strategy:

- All additional building emissions in future years are due to new buildings.
- Energy efficient design, equivalent to 110 percent in excess of the 2008 Title 24 Energy Efficiency Standards, would be implemented for new commercial buildings. A ten (10) percent margin is aligned with the minimum requirements for LEED New Construction²⁸.
- The non-residential standards were assumed to increase seven (7) percent triennially in 2011, 2014 and 2017.
- New buildings were assigned to the following five groups based on the date of the code under which they are/will be permitted: 2005, 2008, 2011, 2014, and 2017. By creating an average of various increases in stringency in relation to the 2005 standards, it is possible to develop a metric that represents the average reduction due to increases in Title 24 Energy Efficiency Standards between 2007 and 2020.

Exceeding Title 24 requirements by ten (10) percent may be achieved through a menu of options including, but not limited to, the options listed under R2E6 above, as appropriate to commercial buildings. This measure would result in a 2.0 percent reduction in total 2020 unmitigated building sector emissions.

R2E8: New Home Renewable Energy (Through the DRP)

²⁷ Personal communication with the California Energy Commission, 2008.

²⁸ LEED 2009 for New Construction and Major Renovations.

<http://www.usgbc.org/ShowFile.aspx?DocumentID=5546>

This measure involves the mitigation of GHG emissions through the County's Development Review Process (DRP) with the installation of solar panels in new residential construction. Through the DRP, GHG emissions from new development in the County will be reduced by 31% as compared to 2020 unmitigated emission projections. It is expected that renewable energy will often be incorporated into new residential developments to achieve the GHG emission reductions required for the project.

Incentives are available to homebuilders through the California Energy Commission's New Solar Homes Partnership (this program provides rebates to developers of six or more units who offer solar power in 50 percent of new units and is a component of the California Solar Initiative). It is likely that many new residential projects will choose to implement solar photovoltaic measures in order to help achieve their 31 percent requirement through the DRP.

The following assumptions were used to calculate emission reductions attributed to this strategy:

- This strategy would only affect newly built residential buildings.
- Solar photovoltaic panels would be installed on 20 percent of new homes built within the County's LUA area.
- Solar energy would reduce the homes projected electricity use by 51 percent. This is the typical reduction in energy use due to the installation of solar on a New Solar Homes Partnership home²⁹.
- Measure R2E6 has been implemented.

This measure would result in a 0.2 percent reduction in total 2020 unmitigated building sector emissions.

R2E9: New Commercial/Industrial Construction Renewable Energy (through DRP)

This measure involves mitigation of GHG emissions through the County's Development Review Process (DRP) with solar (or other renewable) energy measures incorporated into new construction of commercial, office, or industrial development. Through the County's DRP, GHG emissions from new development in the County will be reduced by 31% as compared to 2020 unmitigated emission projections. It is expected that renewable energy will frequently be incorporated into new commercial and industrial developments to achieve the GHG emission reductions required for the project.

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would be adopted by new commercial and industrial projects, except warehousing, which are accounted for in R2E4.
- Projected energy use would be reduced by 15 percent.
- Measure R2E7 has been implemented.

This strategy would result in a 1.7 percent reduction in total 2020 unmitigated building sector emissions.

²⁹ This statistic was based on an unofficial analysis of the New Solar Home Partnership provided by the CEC.

R2E10: Commercial and Industrial Rehabilitation/Expansion Renewable Energy (through the DRP)

This measure involves the installation of solar (or other renewable) energy in commercial and industrial projects requiring discretionary permits for major rehabilitations or expansions (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) of commercial, office, or industrial development greater than or equal to 25,000 square feet in size. The GHG emissions reductions attributed to this measure will be achieved through the County's DRP.

The retrofit rate for commercial/industrial buildings was determined using the *Green Building in North America* methodology, as described above for measure R2E3 to identify the potential scale of new development that this strategy might apply to.

The following assumptions were used to calculate potential emission reductions attributed to this strategy:

- This measure will be implemented by all commercial and industrial major expansions, except for warehousing, which is accounted for in R2E4.
- The measure will result in incorporating solar (or other renewable) energy generation to provide 15 percent or more of the project's energy needs.
- Twenty (20) percent of commercial buildings existing in 2007 will be retrofit or renovated by 2020.

This action would result in a 1.4 percent reduction in total 2020 unmitigated building sector emissions.

R3 Building Energy Measures

The following list of R3 measures for building energy use were not quantified or relied upon to demonstrate achievement of the proposed County 2020 emissions target. These measures facilitate the success of many of the R2 measures described above and are included in the GHG Reduction Plan.

R3E1: Green Building Development Facilitation and Streamlining

The County will continue its efforts to identify and remove regulatory or procedural barriers to implementing green building practices in the County, such as updating codes, guidelines, and zoning. Through its Green County Program, the County provides permit-related and other incentives for energy efficient building projects. Building permit fees are waived for projects that make an existing home or business more energy-efficient, such as through the installation of solar systems, wind-generated electrical systems, tankless water heaters, or highly energy-efficient heating, ventilation, and air-conditioning (HVAC) systems. Additionally, green projects are given priority in plan review, processing and field inspection services.

While facilitating and streamlining green building development would lead to more green building, and hence emission reductions, quantifying these reductions would require speculative assumptions. This measure's effect is not easy to determine because the exact amount of green building developed depends on a considerable number of factors outside the County's jurisdiction.

R3E2: Green Building Training

The County will encourage and promote a trained and qualified workforce by providing green building information, marketing, training, and technical assistance to property owners, development professionals, schools, and special districts. The County will train all plan review and building inspection staff in green building materials, techniques and practices.

This measure, while educational in scope, would likely lead to emissions reductions but the exact amount of reductions is not able to be quantified without making speculative assumptions. This measure's effect is not easy to determine because the exact amount of green building developed depends on a considerable number of factors outside the County's jurisdiction.

R3E3: Community Building Energy Efficiency & Conservation for Existing Buildings

This measure involves a County energy conservation campaign and partnering with utility companies to promote energy efficiency.

The energy conservation campaign would promote energy conservation through campaigns targeted separately at residents, business, schools and utilities. This might include the following activities:

- Launch an "energy efficiency challenge" campaign for community residents.
- Operate a green business program.
- Distribute free compact fluorescent light (CFL) bulbs and/or fixtures to community members.
- Offer a halogen torchiere lamp exchange to community members.

Partnering with utility companies to promote energy efficiency may include the following:

- *Energy Efficiency Audits.* Promote energy efficiency audits of existing buildings to check, repair, and readjust heating, ventilation, air conditioning, lighting, water heating equipment, insulation and weatherization.
- *Individualized Energy Management Services.* Collaborate with utilities to promote individualized energy management services for large energy users.

These programs are mainly facilitative or educational and, though they may result in further emissions reductions, quantifying these reductions would require speculative assumptions and therefore this measure was not quantified.

R3E4: Energy Efficiency Financing

The County will encourage the availability of appropriate financing mechanisms for energy efficiency projects for existing and new developments including heating, ventilation, air conditioning, lighting, water heating, insulation and weatherization. In addition to the programs described in Measure R2E1, the County will:

- Explore joining the state-wide CaliforniaFIRST program.
- Fund other incentives to encourage the use of energy efficient equipment and lighting.
- Target local funds, including Redevelopment and Community Development Block Grant resources, to assist affordable housing developers in incorporating energy efficient designs and features for low-income housing and retrofits for existing low-income housing.

This measure may lead to emissions reductions but the amount of these reductions is not able to be quantified at this time. The effect of this measure is not easy to determine because the exact amount of energy efficiency investments depends on a considerable number of factors outside the County's jurisdiction. Therefore this measure was not quantified.

R3E5: Heat Island Mitigation Plan

The County will pursue developing a "heat island" mitigation plan including guidelines for cool roofs, cool pavements, and strategically placed shade trees. The guidelines would identify strategies to reduce heat gain for 50 percent of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways): shaded (within five [5] years of occupancy); paving materials with a Solar Reflectance Index (SRI) of at least 29; open grid pavement system; parking spaces under cover (defined as underground, under a deck, under a roof, or under a building). Projects using this measure would have a roof used to shade or cover parking with an SRI of at least 29.

This measure would result in lower building energy use due to a lower demand for cooling. However, without knowing the exact makeup of future buildings with these modifications, it is not possible to accurately quantify this measure.

R3E6: Public Education

The County will engage in public outreach to increase community awareness about energy efficiency and emissions reduction programs and incentives. This would educate the local population about energy efficient rebates and incentives available for their residence or type of business.

This measure may result in quantifiable emissions reductions but it is not possible to accurately quantify this measure because its effect on the public is not easily gauged.

R3E7: Cross-Jurisdictional Coordination

The County will coordinate with other local governments, special districts, nonprofits, and other public organizations to share resources, achieve economies of scale, and develop green building policies and programs that are optimized on a regional scale.

This measure may result in quantifiable emissions reductions but it is mainly facilitative in scope and it is not possible to accurately quantify this measure because its exact effect is not easy to determine.

R3E8: Community Alternative Energy Development Plan

The County will explore the possibility of developing an alternative energy plan with Southern California Edison for alternative energy production for the existing built environment which includes identification of appropriate types of alternative energy facilities and potential sites for location in the County.

Developing this plan will aid in the development of alternative energy in the County but it is not possible to accurately quantify this measure because its effect is not easy to determine because alternative energy development depends on a considerable number of factors outside the County's jurisdiction.

R3E9: Support Utility-Scale Renewable Energy Siting and Transmission Lines

The County will pursue identification of possible sites for production of renewable energy using local renewable resources such as solar, wind, small hydro, and, biogas. Geographic Information Systems (GIS) could be used to map and assess local renewable resources, the electric and gas transmission and distribution system, community growth areas anticipated to require new energy services, and other data useful to deployment of renewable technologies. There are likely limited opportunities for small hydropower in the County given the lack of substantial water resources and limited biogas generation opportunities due to the lack of substantial harvestable biomass or suitable growing conditions in much of the County.

Supporting these initiatives will aid in the development of alternative energy in the County but it is not possible to accurately quantify this measure. Its effect is not easy to determine because alternative energy development depends on a considerable number of factors outside the County's jurisdiction.

R3E10: Identify and Resolve Potential Barriers to Renewable Energy Deployment

The County will continue to identify and remove regulatory or procedural barriers to producing renewable energy in building and development codes, design guidelines, and zoning ordinances

Removing these barriers will aid in the development of alternative energy in the County but it is not possible to accurately quantify this measure. Its effect is not easy to determine because alternative energy development depends on a considerable number of factors outside the County's jurisdiction.

R3E11: Solar Ready Buildings Promotion

The County will encourage the construction of new buildings to allow for the easy, cost-effective installation of future solar energy systems. –Solar ready” features should include: proper solar orientation (south facing roof area sloped at 20° to 55° from the horizontal), clear access on the south sloped roof (no chimneys, heating vents, plumbing vents, etc.), electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water system, and space provided for a solar hot water storage tank.

Making buildings –solar ready” will facilitate the installation of solar panels but it is not possible to accurately quantify this measure because the measure would not guarantee the actual installation of new renewable energy. Its effect is not easy to determine because the exact amount of solar panels installed depends on a considerable number of factors outside the County's jurisdiction.

R3E12: Renewable Energy Financing

This measure involves the availability of innovative, low-interest financing for residential and commercial renewable energy. The County will pursue various options for establishing such a financing environment, such as:

- Joining the state-wide California FIRST program.
- Funding other incentive approaches to encourage the use of solar energy in residential and commercial buildings.
- Targeting local funds, including redevelopment and Community Development Block Grant resources, to assist affordable housing developers in incorporating solar PV systems and

solar hot water heaters. Partner with community services agencies.

While financing options will facilitate the installation of renewable energy, it is not possible to accurately quantify this measure. Its effect is not easy to determine because the exact amount of renewable energy installed depends on so many other factors.

R3E13: Regional Renewable Energy Collaboration

The County will explore developing regional collaborations among local governments, special districts, nonprofits, and other public organizations to share resources, achieve economies of scale, and develop renewable energy policies and programs that are optimized on a regional scale.

The effect of this measure is not easy to determine because the exact amount of renewable energy installed depends on a considerable number of factors outside the County's jurisdiction. Hence, it is not possible to accurately quantify this measure.

R3E14: Accessory Wind Energy Systems

The County Development Code provides a uniform and comprehensive set of standards for the placement of accessory wind energy systems on parcels in unincorporated areas of the County in order to encourage the generation of electricity for onsite use, thereby reducing the consumption of electrical power supplied by utility companies. These regulations are intended to facilitate use of wind energy systems and to ensure that accessory wind energy systems are designed and located in a manner that minimizes visual and safety impacts on the surrounding community. (See Chapter 85.18 of the County Development Code).

Supporting these initiatives will aid in the development of alternative energy in the County but it is not possible to accurately quantify this measure. Its effect is not easy to determine because alternative energy development depends on a considerable number of factors outside the County's jurisdiction.

R3E15: Off-Site Mitigation of GHG Impacts for New Development.

The County will pursue development of a policy and/or guidelines for off-site mitigation of GHG impacts from new development projects in accordance with CEQA, including retrofitting off-site buildings to improve energy efficiency. As the DRP already includes a 31 percent reduction requirement for new development, use of off-site mitigation is already accounted for in the assumptions concerning the effect of the DRP overall. Further, it is unknown to what degree new development may rely on off-site mitigation options.

Transportation and Land Use Measures

Regarding land use, the County’s General plan policies, as presented in Appendix C, support infill development, mixed use-development, and transit-oriented growth that will, in time, promote VMT reductions for new development. With the passage of SB 375, there will be opportunities for further transportation reductions in association with long-term regional land use/transportation planning to promote smart growth, mixed use, increased use of transit, reduction in vehicle trips and trip length, and use of alternative transportation. However, given the nature of the County’s land use jurisdiction being located on the periphery of incorporated areas, effective action in this area requires a coordinated planning effort in partnerships with the cities in the County and regional, state, and federal funding sources to identify the truly feasible means for transportation reductions. The County is working with the cities in the County, the San Bernardino Association of Governments (SANBAG), and the Southern California Association of Governments (SCAG) within the SB 375 framework to consider opportunities to support transit-oriented growth, transit linkages, and other land use and transportation improvements over the next decade. The end result of that dialogue between now and 2012, when the new Regional Transportation Plan (RTP) will be adopted, will likely result in the addition of quantifiable reductions beyond those identified in this report for 2020.

The long-term benefit of such land use and transportation planning efforts will be critical to the post-2020 reduction effort and are likely to take until that time to substantially contribute to the overall reduction effort. Accordingly, this reduction plan focuses primarily on transportation measures that can start to reduce emissions in the near-term while the longer-range planning is being completed. As noted in measures R3T1 and R3T4 below and in the General Plan policies noted in Appendix C, the County will be supporting regional action to promote transit and regional land use and transportation planning.

This section provides information on calculations of GHG emission reductions related to R1 and R2 for the transportation sector for the County.

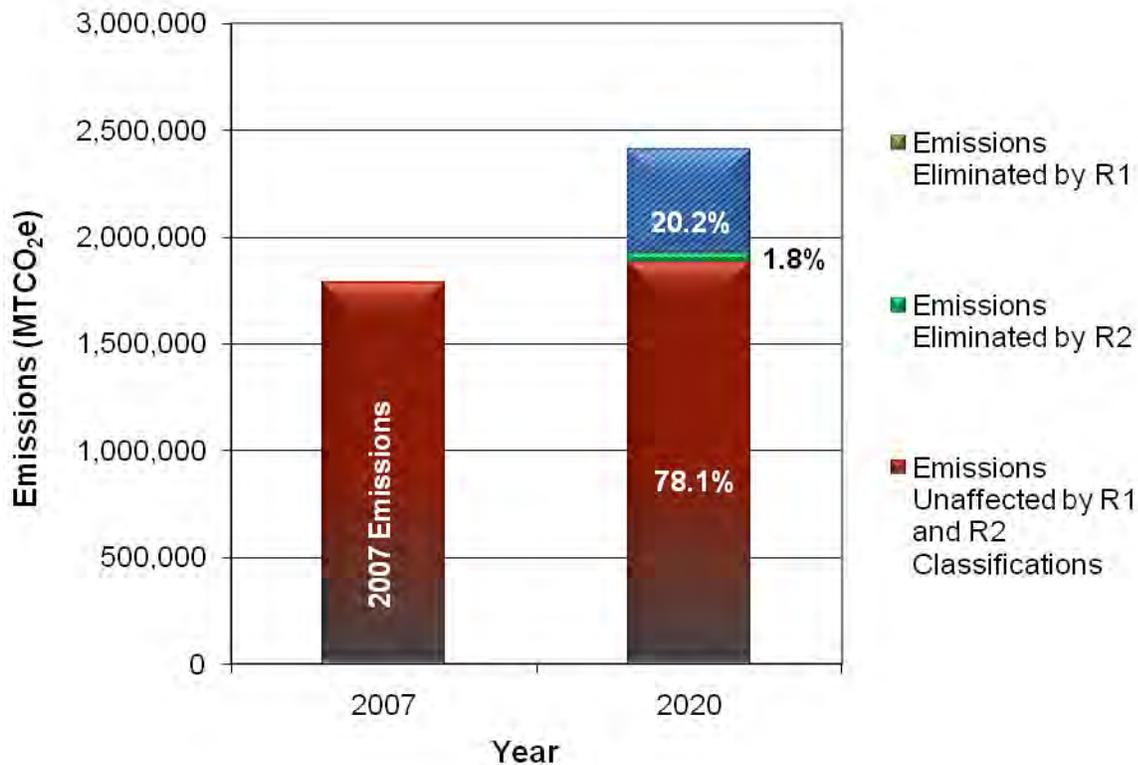
Total estimated GHG percent reductions and quantities from the reduction measures included in Reduction Scenarios R1 and R2 are presented below in **Table A-19**. Emission reductions for each measure are applied to the projected 2020 emissions for the appropriate vehicle type. Total reductions attributed to these measures from the 2020 unmitigated emissions would be approximately 22 percent.

Table A-19. External GHG Emission Reductions from Transportation And Land Use Measures

Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Transportation Emissions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional transportation measures that do not require County action		
R1T1: California Light-Duty Vehicle GHG Standards: Implement Pavley I Standards	202,569	8.4
R1T2: California Light-Duty Vehicle GHG Standards: Implement Pavley II	29,252	1.2
R1T3: Low Carbon Fuel Standard	161,819	6.7
R1T4: Tire Pressure Program	4,022	0.2

Reduction Classification and Reduction Measure	GHG Reductions from 2020 unmitigated Transportation Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1T5: Low Rolling Resistance Tires	2,194	0.1
R1T6: Low Friction Engine Oils	20,476	0.8
R1T7: Cool Paints and Reflective Glazing	6,509	0.3
R1T8: Goods Movement Efficiency Measures	37,441	1.6
R1T9: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)	12,514	0.5
R1T10: Medium-and Heavy-Duty Vehicle Hybridization	7,695	0.3
R1T11: Rule 1192—Clean On-Road Transit Buses	835	0.03
R1T12: Rule 1195—Clean On-Road School Buses	831	0.03
R2: Existing and new transportation measures that require County action		
R2T1: Anti-Idling Enforcement Policy	12,076	0.5
R2T2: Employment Based Trip and VMT Reductions Policy	1,651	0.1
R2T3: Revise Parking Policies	824	0.03
R2T4: Roadway Improvements including Signal Synchronization and Traffic Flow Management	8,230	0.3
R2T5: Expand Renewable Fuel/Low-Emission Vehicle Use	16,295	0.7
R2T6: Ridesharing and Carpooling	798	0.03
R2T7: Bicycle/Pedestrian Infrastructure and Promotion	798	0.03
R2T8: Construct High Occupancy Vehicle (HOV) Lanes	1,594	0.1
Total	528,422	21.9
R3: Existing and new transportation measures—reductions not quantified or relied upon to achieve reduction goal		
R3T1: Public Transit Measures		
R3T2: Financing Mechanisms and Opportunities		
R3T3: Diesel Exhaust Emissions Control Measures		
R3T4: Regional Land Use/Transportation Coordination		
R3T5: Regional Employment Based Trip Reduction Programs.		
R3T6: County Commuter Services Program.		
R3T7: Home Employment.		
R3T8: Intelligent Transportation Systems Applications.		
R3T9: Public Outreach and Educational Programs Relative to Various Modes of Transportation.		
R3T10: Land Use Strategies to Reduce Reliance on Automobile Use		

Figure A-6. External GHG Emission Reductions from Transportation and Land Use Measures



With the implementation of the emission reduction measures included in this Plan, transportation emissions will be reduced by 22 percent from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately 5 percent higher than 2007 emissions.

R1 Transportation and Land Use Measures

This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* national, state, or regional transportation measures that do not require significant County action and will result in future GHG reductions associated with transportation sector within the County LUA.

RIT1: Assembly Bill 1493: Pavley I

AB1493 (Pavley) required the CARB to adopt regulations that will reduce GHG from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 MMTCO₂e, representing 17.3 percent of emissions from passenger/light-duty vehicles in the State³⁰.

This regulation will result in a 17.3 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 9.3 percent reduction of total 2020 unmitigated on-road transportation emissions.

³⁰ California Air Resources Board 2008a, 2009a.

RIT2: Assembly Bill 1493: Pavley II

California committed to further strengthening the AB1493 standards beginning in 2017 to obtain a 45 percent GHG reduction from 2020 model year vehicles. By 2020, this requirement will reduce emissions in California by approximately 4.0 MMTCO₂e, representing 2.5 percent of emissions from passenger/light-duty vehicles in the State³¹.

This regulation will result in a 2.5 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 1.3 percent reduction of total 2020 unmitigated on-road transportation emissions.

RIT3: Executive Order S-1-07 (Low Carbon Fuel Standard)

The LCFS will require a reduction of at least ten (10) percent in the carbon intensity of California's transportation fuels by 2020. By 2020, this requirement will reduce emissions in California by approximately 15 MMTCO₂e, representing 6.9 percent of emissions from passenger/light-duty vehicles in the State³².

This regulation will result in a 6.9 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 7.4 percent reduction in total 2020 unmitigated on-road transportation emissions.

RIT4: Tire Pressure Program

The AB32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. By 2020, this requirement will reduce emissions in California by approximately 0.55 MMTCO₂e, representing 0.3 percent of emissions from passenger/light-duty vehicles in the State.³³

This regulation will result in a 0.3 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 0.18 percent reduction of total 2020 unmitigated on-road transportation emissions.

RIT5: Low Rolling Resistance Tires

This AB32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 MMTCO₂e, representing 0.2 percent of emissions from passenger/light-duty vehicles in the State³⁴.

This regulation will result in a 0.3 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 0.1 percent reduction of total 2020 unmitigated on-road transportation emissions.

RIT6: Low Friction Engine Oils

This AB32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce

³¹ California Air Resources Board 2008a, 2009a.

³² California Air Resources Board 2008a, 2009a.

³³ California Air Resources Board 2008a, 2009a.

³⁴ California Air Resources Board 2008a, 2009a.

emissions in California by approximately 2.8 MMTCO₂e, representing 1.7 percent of emissions from passenger/light-duty vehicles in the State³⁵.

This regulation will result in a 1.7 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 0.9 percent reduction of total 2020 unmitigated on-road transportation emissions.

RIT7: Cool Paints and Reflective Glazing

This AB32 early action measure is based on measures to reduce the solar heat gain in a vehicle parked in the sun. By 2020, this requirement will reduce emissions in California by approximately 0.89 MMTCO₂e, representing 0.6 percent of emissions from passenger/light-duty vehicles in the State³⁶.

This regulation will result in a 0.6 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 0.3 percent reduction of total 2020 unmitigated on-road transportation emissions.

RIT8: Goods Movement Efficiency Measures

This AB32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 MMTCO₂e, representing 1.6 percent of emissions from all mobile sources (on-road and off-road) in the State³⁷.

This regulation will result in a 1.6 percent reduction from 2020 unmitigated mobile source emissions.

RIT9: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This AB32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 MMTCO₂e, representing 1.9 percent of emissions from heavy-duty vehicles in the State³⁸.

This regulation will result in a 1.9 percent reduction from 2020 unmitigated heavy-duty vehicle emissions and a 0.6 percent reduction of total 2020 unmitigated and on-road transportation emissions.

RIT10: Medium and Heavy-Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 MMTCO₂e, representing 0.2 percent of emissions from all on-road mobile

³⁵ California Air Resources Board 2008a, 2009a.

³⁶ California Air Resources Board 2008a, 2009a.

³⁷ California Air Resources Board 2008a, 2009a.

³⁸ California Air Resources Board 2008a, 2009a.

sources in the State³⁹. This reduction is also equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the State.

This regulation will result in a 1.0 percent reduction from 2020 unmitigated heavy-duty vehicle emissions and a 0.4 percent reduction from 2020 unmitigated on-road transportation emissions.

Regional Transportation Measures

South Coast Air Quality Management District (SCAQMD) Fleet Rules⁴⁰

The following rules are primarily intended to reduce air toxic and criteria pollutant emissions by requiring low-emitting gasoline/diesel or alternative-fuel vehicles. Alternative-fuel vehicles required by these regulations produce lower GHG emissions than their gasoline and diesel counterparts.

RIT13: SCAQMD Rule 1192: Clean On-Road Transit Buses

This rule requires public transit fleets operating in the SCAQMD's jurisdiction to acquire alternative-fuel heavy-duty vehicles when procuring these vehicles. This rule applies to public transit fleets with 15 or more public transit vehicles or urban buses, operated by government agencies or operated by private entities under contract to government agencies that provide passenger transportation services including intra- and intercity shuttle services⁴¹.

The following assumptions were used to estimate GHG emission reductions associated with this SCAQMD requirement:

- According to the ARB, the transit bus fleet consists of only 22 model years⁴²; consequently, by 2020, approximately 59 percent of the 2007 transit bus fleet will be retired.
- All new transit buses would use compressed natural gas (CNG) instead of diesel fuel. Heavy-duty vehicles running on CNG produced by natural gas from California emit 18.3 percent less GHG emissions than the same vehicles running on LCFS compliant diesel fuel⁴³. Consequently, this rule results in a reduction of 10.8 percent of 2020 unmitigated emissions from buses

This regulation will result in a 0.04 percent reduction from 2020 unmitigated on-road transportation emissions.

RIT14: Rule 1193: SCAQMD Rule 1195: Clean On-Road School Buses

This rule requires public and private school bus fleet operators in the SCAQMD's jurisdiction to acquire alternative-fuel school buses when procuring or leasing new school buses or to retrofit used or existing school buses with a CARB-approved control device for use within the SCAQMD's jurisdiction. This rule applies to school bus fleets with 15 or more school buses⁴⁴.

The following assumptions were used to estimate GHG emission reductions associated with this SCAQMD requirement:

³⁹ California Air Resources Board 2008a, 2009a.

⁴⁰ There are no applicable Mojave Desert Air Quality Management (MDAQMD) regulations pertaining to GHG emission reduction from on-road vehicles.

⁴¹ South Coast Air Quality Management District 2000a

⁴² California Air Resources Board 2002.

⁴³ California Air Resources Board 2008b.

⁴⁴ South Coast Air Quality Management District 2000b

- The school bus fleet is similar to the transit bus fleet, which consists of only 22 model years⁴⁵; consequently, by 2020, approximately 59 percent of the 2007 transit bus fleet will be retired.
- All new school buses would use compressed natural gas (CNG) instead of diesel fuel. Heavy-duty vehicles running on CNG produced by natural gas from California emit 18.3 percent less GHG emissions than the same vehicles running on LCFS compliant diesel fuel⁴⁶. Consequently, this rule results in a reduction of 10.8 percent of 2020 unmitigated emissions from school buses

This regulation will result in a 0.04 percent reduction from 2020 unmitigated on-road transportation emissions respectively.

R2 Transportation and Land Use Measures

This section describes the methodology used to calculate GHG emission reductions for the R2 measures that have been implemented or that will be implemented, resulting in GHG reductions for the transportation sector and require significant County action. The following measures reduce unmitigated vehicle miles traveled (VMT) for the passenger/light-duty sector of transportation 2020 emissions. VMT and GHG emissions scale linearly; for example, a five (5) percent reduction in VMT will result in a five (5) percent reduction in GHG emissions.

Each measure accounts for emission reductions already achieved with R1 transportation and land use measures, and any preceding R2 transportation measures, thereby eliminating any potential double counting of emission reductions. R1 measures that reduce GHG emissions through fuel efficiency improvements for passenger/light-duty vehicles include measures R1T1-R1T7 and R1T11. The emission reductions associated with these R1 measures are subtracted from the 2020 unmitigated emissions before applying additional reductions achieved with R2 measures. In addition, each R2 measure presented below accounts for emission reductions achieved through all relevant preceding R2 measures to avoid double-counting of emission reductions. A description of each measure is followed by the resulting GHG reductions.

R2T1: Anti-Idling Enforcement

The County adopted an anti idling ordinance requiring all discretionary land use projects approved by the County on or after January 15, 2009, and all business establishments that use diesel vehicles or off-road equipment as part of their normal business operations shall adhere to the following measures during their operations to reduce diesel particulate matter emissions from diesel-fueled engines⁴⁷:

- Vehicles/off-road equipment shall not be left idling on site for periods in excess of five (5) minutes.

Although this measure is designed to reduce diesel particulate matter, idling restrictions on diesel vehicles will also result in reduced fuel consumption and GHG reductions. GHG reductions attributed to this restriction were quantified using CARB's methodology for calculating heavy-duty vehicle idling restrictions in California; these reductions only apply to heavy-duty vehicles.

⁴⁵ California Air Resources Board 2002.

⁴⁶ California Air Resources Board 2008b.

⁴⁷ County of San Bernardino 2008

See measure R3T2 for a more detailed discussion of County diesel exhaust emission control measures.

AB32 includes an early action measure to achieve emission reductions by increasing compliance with anti-idling rules, thereby reducing the amount of fuel burned through unnecessary idling. Measures may include enhanced field enforcement of anti-idling regulations, increased penalties for violations of anti-idling regulations, and restriction on registrations of heavy-duty diesel vehicles with uncorrected idling violations. These measures are likely to be carried out by the County or other local entities, and may be supported by the County's anti-idling ordinance. By 2020, 100 percent compliance with the anti-idling rules will reduce emissions in California by approximately 0.7 MMTCO₂e, representing 1.8 percent of emissions from heavy-duty diesel vehicles, or 0.5 percent of emissions from all mobile sources (on-road and off-road) in the State⁴⁸.

This regulation will result in a 1.8 percent reduction from 2020 unmitigated heavy-duty diesel vehicle emissions and a 0.6 percent reduction of total 2020 unmitigated on-road transportation emissions.

R2T2: Employment Based Trip and VMT Reduction Policy

This measure requires creating commuter-choice programs, employer transportation management, guaranteed ride-home programs, and commuter assistance and outreach programs. The County shall evaluate the feasibility of implementing a voluntary trip reduction ordinance that promotes the preparation and implementation of a trip reduction plan (TRP) for large employers (100 employees or more). This ordinance expands upon SCAQMD Rule 2202 (Employee Commute Reduction Program). SCAQMD Rule 2202 requires employers with 250 employees or more to reduce work-related vehicle trips through mandatory average vehicle ridership targets based on employer characteristics. This ordinance will require employers with 100 employees or more in the unincorporated County to implement a TRP with more stringent requirements than SCAQMD's rule. The TRP should include, at a minimum, performance of annual employee commute surveys, marketing of commute alternatives, ride matching assistance, and transit information.

The following assumptions were used to calculate emission reductions attributed to this measure:

- By 2020, this measure would result in a 0.2 percent reduction of passenger/light-duty VMT in the County⁴⁹.
- The magnitude of the reduction in VMT reflects the decentralized and geographically extensive transportation network in the County⁵⁰.
- Measures R1T1-R1T7, R1T11, and R2T1 have been implemented

This measure will result in a 0.1 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, and R2T1.

⁴⁸ California Air Resources Board 2008a, 2009a.

⁴⁹ Greene, D. L., and Shafer, A. 2003.

⁵⁰ Greene, D. L., and Shafer, A. 2003.

R2T3: Preferential Parking Policies This measure involves the County's implementation of a comprehensive parking policy for public and private lots throughout the County that:

- a. Encourages carpooling, shared parking and the use of alternative transportation, including providing parking spaces for carpool vehicles and alternative fuel vehicles at convenient locations accessible by public transportation;
- b. Reduces parking requirements and/or provide for shared parking for special uses such as mixed-use projects, residential developments for senior citizens or projects that are within 0.25 mile of a public transit stops;
- c. Promotes the designation of preferred commercial parking spaces for high-occupancy, car-share, and alternative fuel vehicles;
- d. Encourages larger parking spaces to accommodate vans used for ride-sharing; and
- e. Promotes the use of shade trees, and convenient pedestrian pathways through parking areas.

The following assumptions were used to calculate emission reductions attributed to this measure:

- By 2020, this measure would result in a 0.1 percent reduction of passenger/light-duty VMT in the County⁵¹.
- The magnitude of the reduction in VMT reflects the decentralized and geographically extensive transportation network in the County⁵².
- Measures R1T1-R1T7, R1T11, and R2T1-R2T2 have been implemented.

This measure will result in a 0.04 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, R2T1, and R2T2.

R2T4: Roadway Improvements including Signal Synchronization and Traffic Flow Management

This measure requires modification of arterial roadways to allow more-efficient bus operation, including possible signal preemption, expand signal-timing programs where air quality benefits can be demonstrated, synchronize traffic signals throughout the County and with adjoining cities while allowing free flow of mass transit systems, and require continuous maintenance of the synchronization system. This measure would increase traffic flow and reduce vehicle idling.

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would result in a one (1) percent reduction in fuel consumption⁵³.
- Measures R1T1-R1T7, R1T11, and R2T1-R2T4 have been implemented.

This measure will result in a 0.4 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, and R2T1-T4.

⁵¹ Greene, D. L., and Shafer, A. 2003.

⁵² Greene, D. L., and Shafer, A. 2003.

⁵³ HDR Engineering 2009

R2T5: Expand Renewable Fuel/Low-Emission Vehicle Use

The County will collaborate with local and regional governments, businesses and energy purveyors to support expanded use of renewable fuels. Said efforts may include, but are not limited to, the following:

- a. Preferential parking for alternative fuel vehicles;
- b. Collaboration with energy purveyors to provide the necessary facilities and infrastructure to encourage the use of privately owned low or zero-emission vehicles such as electric charging facilities and conveniently located alternative fueling stations; and
- c. Encourage taxi operators to use smaller, more fuel-efficient taxicabs and offer incentives to taxicab owners to use gas-electric hybrid vehicles.

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would result in a two (2) percent increase in average MPG passenger/light-duty vehicles by 2020⁵⁴.
- A two (2) percent increase in average MPG passenger/light-duty vehicles would reduce emissions from passenger/light-duty vehicles by two (2) percent.
- Measures R1T1-R1T7, R1T11, and R2T1-R2T4 have been implemented.

This measure will result in a 0.8 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, and R2T1-T5.

R2T6: Increase the Use of Ridesharing.

This measure involves the County's promotion and encouragement of ridesharing as follows:

- a. Exploring financing programs for the purchase or lease of vehicles used in employer ride sharing programs;
- b. Encouraging community car-sharing through employers, such as expanding the existing Commute-Smart measure;
- c. Encouraging community creation of rideshare incentives such as gas cards, carpool awards, educational seminars, commuter-choice programs, commuter-tax benefits, guaranteed ride-home programs, commuter assistance and outreach

The following assumptions were used to calculate emission reductions attributed to this measure:

- By 2020, this measure would result in a 0.1 percent reduction of passenger/light-duty VMT in the County⁵⁵.
- The magnitude of the reduction in VMT reflects the decentralized and geographically extensive transportation network in the County⁵⁶.
- Measures R1T1-R1T7, R1T11, and R2T1-R2T5 have been implemented.

⁵⁴ San Francisco Department of the Environment 2004

⁵⁵ Greene, D. L. and Shafer, A. 2003.

⁵⁶ Greene, D. L. and Shafer, A. 2003.

This measure will result in a 0.04 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, and R2T1-T6.

R2T7: Bicycle/Pedestrian Infrastructure and Promotion

To promote bicycle and pedestrian infrastructure, the County will: 1) require new development, through the development review process, to address and incorporate bicycle/pedestrian facilities where appropriate and require new development to provide bicycle lanes and walking paths near schools with adequate bicycle parking; 2) encourage the development of bicycle stations at intermodal hubs in collaboration with regional transportation providers; 3) establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel, and will require bike racks along these trails at secure, lighted locations; and 4) apply for regional, State, and federal grants for bicycle and pedestrian infrastructure projects, and will consider using development exactions/impact fees, such as the County's Santa Ana River Trail development fee, to provide bicycle and pedestrian facilities.

The following assumptions were used to calculate emission reductions attributed to this measure:

- By 2020, this measure would result in a 0.1 percent reduction of passenger/light-duty VMT in the County⁵⁷.
- The magnitude of the reduction in VMT reflects the decentralized and geographically extensive transportation network in the County⁵⁸.
- Measures R1T1-R1T7, R1T11, and R2T1-R2T6 have been implemented.

This measure will result in a 0.04 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, and R2T1-T7.

R2T8: Support High Occupancy Vehicle (HOV) Lanes

This measure involves the County's support of regional construction of HOV lanes on arterial roadways to encourage carpooling and alternative forms of transportation for commuting, to increase traffic flow and reduce VMT.

The following assumptions were used to calculate emission reductions attributed to this measure:

- By 2020, this measure would result in a 0.2 percent reduction of passenger/light-duty VMT in the County⁵⁹.
- The magnitude of the reduction in VMT reflects the decentralized and geographically extensive transportation network in the County⁶⁰.
- Measures R1T1-R1T7, R1T11, and R2T1-R2T7 have been implemented.

This measure will result in a 0.07 percent reduction from 2020 unmitigated on-road transportation emissions after accounting for emission reductions attributed to R1T1-R1T7, R1T11, and R2T1- R2T7.

⁵⁷ Greene, D. L. and Shafer, A. 2003.

⁵⁸ Greene, D. L., and Shafer, A. 2003.

⁵⁹ Greene, D. L., and Shafer, A. 2003.

⁶⁰ Greene, D. L., and Shafer, A. 2003.

R3 Land Use and Transportation Measures

The following list of R3 measures includes all additional measures considered reasonable but not relied upon to demonstrate achievement of the proposed County 2020 emissions target. All of these measures are considered part of the GHG Reduction Plan.

R3T1: Public Transit Strategies

To promote public transit use, the County will: 1) ensure that new development is designed to make public transit a viable choice for residents and/or the local work force; 2) require that new development incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation; and 3) collaborate with regional transit providers to offer public transit incentives, and improve service, safety, customer satisfaction and user-friendliness of mass transit..

These measures could shift VMT from single-occupancy vehicles to public transit vehicles, reducing net VMT and overall GHG emissions from on-road transportation. Public transit measures could reduce VMT by at least 0-2.6 percent⁶¹.

R3T2: Financing Mechanisms and Opportunities

This measure involves the County's promotion and pursuance of financing mechanisms and opportunities including the Federal Energy Efficiency Community Block Grant (EECBG), Measure I Funds through SANBAG, Regional Improvement Program (RIP) funds available under the State Transportation Improvement Program (STIP), the Interregional Improvement Program (IIP), the Regional Transportation Improvement Program through SANBAG and SGAG, the Passenger Rail Short Transportation Plan, the San Bernardino County Public Transit – Human Services Transportation Coordination Plan, and the Transportation Development Act. There are currently numerous financing mechanisms and opportunities available to the County to achieve additional reductions not already included in the R1 or R2 measures above. A summary of these mechanisms is presented in the Implementation section of this report.

R3T3: Diesel Exhaust Emissions Control Measures

The County's diesel exhaust emissions control measures extend beyond the County's idling restriction (measure R2T1) described above. As described in Section 83.01.040 of the County Development Code, the following emissions control measures shall apply to all discretionary land use projects approved by the County on or after January 15, 2009⁶²:

Off-Road Diesel Vehicle/Equipment Operations. All business establishments and contractors that use off-road diesel vehicle/equipment as part of their normal business operations shall adhere to the following measures during their operations in order to reduce diesel particulate matter emissions from diesel-fueled engines:

- Off-road vehicles/equipment shall not be left idling on site for periods in excess of five minutes. The idling limit does not apply to:
 - idling when queuing,
 - idling to verify that the vehicle is in safe operating condition,

⁶¹ Greene, D. L. and Shafer, A. 2003.

⁶² County of San Bernardino 2008

- idling for testing, servicing, repairing or diagnostic purposes,
- idling necessary to accomplish work for which the vehicle was designed (such as operating a crane),
- idling required to bring the machine system to operating temperature, and
- idling necessary to ensure safe operation of the vehicle.
- Use reformulated ultra low-sulfur diesel fuel in equipment and use equipment certified by the U. S. Environmental Protection Agency (EPA) or that pre-dates EPA regulations.
- Maintain engines in good working order to reduce emissions.
- Signs shall be posted requiring vehicle drivers to turn off engines when parked.
- Any requirements or standards subsequently adopted by the South Coast Air Quality Management District, the Mojave Desert Air Quality Management District or the California Air Resources Board.
- Provide temporary traffic control during all phases of construction.
- Onsite electrical power connections shall be provided for electric construction tools to eliminate the need for diesel-powered electric generators, where feasible.
- Maintain construction equipment engines in good working order to reduce emissions. The developer shall have each contractor certify that all construction equipment is properly serviced and maintained in good operating condition.
- Contractors shall use ultra low sulfur diesel fuel for stationary construction equipment as required by Air Quality Management District (AQMD) Rules 431.1 and 431.2 to reduce the release of undesirable emissions.
- Substitute electric and gasoline-powered equipment for diesel-powered equipment, where feasible.

Project Design. Distribution centers, warehouses, truck stops and other facilities with loading docks where diesel trucks may reside overnight or for periods in excess of three hours shall be designed to enable any vehicle using these facilities to utilize on-site electrical connections to power the heating and air conditioning of the cabs of such trucks, and any refrigeration unit(s) of any trailer being pulled by the trucks, instead of operating the diesel engines and diesel refrigeration units of such trucks and trailers for these purposes. This requirement shall also apply to Recreational Vehicle Parks (as defined in Section 810.01.200(k) of this title) and other development projects where diesel engines may reasonably be expected to operate on other than an occasional basis.

These regulations were not quantified because it is difficult to estimate emission reductions from these restrictions beyond what is quantified for measure R2T1.

R3T4: Regional Land Use/Transportation Coordination.

In accordance with SB 375, as Regional Planning Agencies set regional targets for greenhouse gas emissions and create a plan to meet those targets, coordinate with local jurisdictions, the San Bernardino Associated Governments (SANBAG), the Southern California Association of

Governments (SCAG) and the regional transit providers to promote mixed-use development, transit linkages and transit-oriented development in unincorporated portions of the County.

Senate Bill 375 requires California to set regional targets to reduce GHG emissions from passenger vehicles and light duty trucks for 2020 and 2035. ARB has adopted a goal for the SCAG region of reducing 2020 passenger/light duty truck emissions by 8 percent per capita compared to 2005 per capita levels. ARB adopted a condition goal for 2035 of reducing these emissions by 13 percent but the 2035 goal is contingent on further discussion and analysis between ARB and SCAG.

A Sustainable Communities Strategy is in development for the SCAG region. At this time, the exact amount of benefit of potential transportation and land use strategies that might be adopted by San Bernardino County in light of SB 375 are not known. However, the measures in this Plan could help the County meet this regional goal in combination with regional transit implements (see R3T1) pursuant to SB 375.

With the regional planning activities taking place over the next few years, the reduction value of this measure will be quantified as the planning is developed and completed.

R3T5: Regional Employment Based Trip Reduction Programs

The County will continue to support and promote trip reduction programs developed by SANBAG. SANBAG is responsible for efforts throughout San Bernardino County to encourage commuters to carpool, vanpool, use public transit, cycle, or walk to work. This is primarily accomplished by working directly with large and small employers, as well as providing support to commuters who wish to share rides or use alternative forms of transportation. SANBAG operates two programs for individuals and one for employers through which commuters can receive financial incentives by participating in a rideshare program. Option Rideshare is a program that offers commuters financial incentives of up to \$2.00 per day when they use a rideshare mode for three consecutive months. Team Ride is an extension of the initial program that provides discounts and special offers to participants at restaurants and events in both San Bernardino and Riverside Counties. The final program is the Inland Empire Commuter Services Program. This program is designed to help employers develop and maintain a rideshare program through free education and assistance from SANBAG.

The exact amount of participation in this regional program in the future is not known at this time and thus the amount of potential new GHG emissions reductions for this measure beyond other R2 measures was not quantified.

R3T6: County Commuter Services Program

The County's Human Resources Department has operated and will continue to operate an active and effective Commuter Services Program to encourage, coordinate, and reward alternative commuting for more than two decades. The County's Commuter Services Program provides employees with tools to find a carpool partner or vanpool, tips on bicycle commuting, and information on transit. Nearly 4,000 County employees take advantage of this program and enjoy the benefits of alternative commuting.

The exact amount of participation in this County program in the future is not known at this time and thus the amount of potential new GHG emissions reductions for this measure was not quantified.

R3T7: Home Employment

The County will facilitate employment opportunities that minimize the need for private vehicle trips, including:

- a. Encouraging live/work sites, satellite work centers in appropriate locations, and home occupation for low-impact commercial and office uses in residential zones, regulated by the County's Development Code Home Occupation Permit provisions.
- b. Encouraging telecommuting with new and existing employers, through project review and incentives, as appropriate.

The exact amount of participation in this program in the future is not known at this time and thus the amount of potential new GHG emissions reductions for this measure was not quantified.

R3T8: Intelligent Transportation Systems Applications

The County will continue to utilize Intelligent Transportation Systems, which constitute a wide spectrum of techniques and applications that are currently being applied to existing roadways, highways and transit systems to increase their efficiency, safety and ability to relieve congestion. The County is currently employing several types of Intelligent Transportation Systems applications including:

- a. 1-800-COMMUTE telephone line, which provides travel information for highways, transit, rideshare and other commuting alternatives;
- b. Closed-circuit television cameras to help in identifying and responding to accidents more quickly;
- c. Electronic sensors placed in freeways that transmit vehicle counts to a traffic management center and can be used for real-time traffic conditions;
- d. Traffic signal control systems that are synchronized through computer software specifically designed to better monitor and respond to local traffic congestion;
- e. Changeable message signs that alert drivers to possible delays due to accident or congestion and allow for route diversion; and
- f. Smart call boxes that gather traffic count data and transmit this information to traffic management centers and the CHP.

The exact amount of ITS development by 2020 is not known at this time and thus the amount of potential new GHG emissions reductions for this measure was not quantified.

R3T9: Public Outreach and Educational Programs Relative to Various Modes of Transportation

This measure involves the following: 1) The County will continue to implement bicycle safety educational programs to teach drivers and riders the laws, riding protocols, routes, safety tips and emergency maneuvers; and 2) The County will provide educational information about the benefits of and opportunities for public transit and rideshare.

While education and outreach are key element to promoting transit and bicycle use, it is not possible to estimate the amount potential new GHG emissions reductions for this measure beyond other measures in this Plan.

R3T10: Land Use Strategies to Reduce Reliance on Automobile Use

This measure involves the County's actions to promote and adopt land use strategies that decrease reliance on automobile use and enhance non-automotive transportation as follows:

- a. Where appropriate, create and preserve distinct, identifiable neighborhoods whose characteristics support pedestrian travel, especially within, but not limited to, mixed-use and transit-oriented development projects.
- b. Continue to allow site-specific development standards to be implemented for Planned Development projects.
- c. Consider revising the County Development Code where appropriate to allow local-serving businesses, such as childcare centers, restaurants, banks, family medical offices, drug stores, and other similar services near employment centers to minimize midday vehicle use.
- d. Continue to identify and facilitate the inclusion of complementary land uses not already present in the zoning land use districts, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business zoning districts, to reduce the vehicle miles traveled and promote bicycling and walking to these uses.
- e. Encourage mixed-use development especially within areas of city's spheres of influence or where the project is located within one-half mile of intermodal hubs and future rail stations.
- f. Continue to provide density bonuses for selected development.
- g. Seek funding to prepare specific plans and related environmental documents to facilitate mixed-use development at selected sites, and allow these areas to serve as receiver sited for transfer of development rights away from environmentally sensitive lands and rural areas outside of developed areas.
- h. Enable the development of mixed-use structures in neighborhood centers that can be adapted to new uses over time with minimal internal remodeling.
- i. Continue to encourage the inclusion of complementary land uses in local zoning districts that allows a mix of uses, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business districts to reduce the vehicle miles traveled and promote bicycling and walking to these uses.
- j. Encourage infill development and the creative reuse of brownfield, under-utilized and/or defunct properties within areas of County's spheres of influence.
- k. Consider higher-density development within areas of city's spheres of influence or where the project is located within one-half mile of intermodal hubs and future rail stations.

It is expected that the County will incorporate these different strategies over time in cooperation with other regional entities through planning under SB 375 and of its own accord. Until specific local planning is conducted for target areas, quantification of the GHG reductions of these actions would be premature; as a result reductions from these strategies was not relied upon to demonstrate meeting the external emissions reduction target.

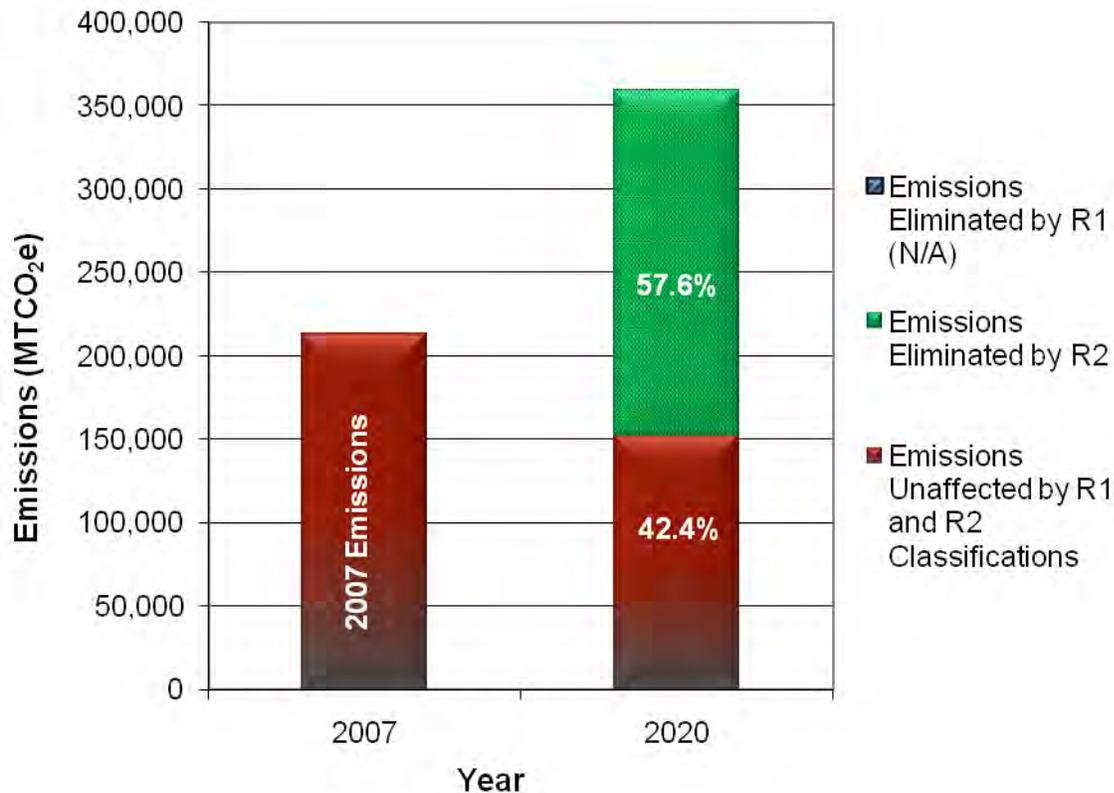
Municipal Solid Waste Management

This section provides information on calculations of GHG emission reductions related to R1 and R2 for municipal solid waste management for the County. Results of the emissions reduction calculations are shown in **Table A-20**. Total reductions attributed to these measures from the 2020 unmitigated emissions are 58 percent.

Table A-20. External GHG Emission Reductions from Waste Measures

Reduction Classification and Reduction Measures	GHG Reductions from 2020 unmitigated Waste Emissions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional waste management measures that do not require County action		
NA		
R2: Existing and new measures that require County action		
R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	97,059	27.0
R2W2: Barstow Methane Recovery	37,935 ^a	10.6
R2W3: Landers Methane Recovery	8,471 ^b	2.4
R2W4: Comprehensive Disposal Site Diversion Program	26,390	7.3
R2W5: C&D Recycling Program	295	0.1
R2W6: County Diversion Programs — 75 Percent Goal ^c	4,118	1.1
R2W7: City Diversion Programs— 75 Percent Goal ^c	32,692	9.1
Total	206,959	57.6
R3: Existing and new waste measures – reductions not quantified or relied upon to achieve reduction goal		
R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP		
R3W2: Financing Mechanisms and Opportunities		
R3W3: Waste Education Program		
R3W4: Additional Landfill Methane Controls		
R3W5: Landfill Gas to Energy Projects		
Notes:		
Reductions for these measures solely represent avoided methane emissions at landfills and assume that all waste reduction measures are implemented in combination.		
^a Attributed to waste in place methane reductions from Barstow as well as new waste planned for Barstow.		
^b Attributed only to existing waste in place at Landers.		
^c Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of County-generated waste by 2020.		
^d Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of City-generated waste by 2020.		

Figure A-7. External GHG Emission Reductions from Solid Waste/Landfill Measures



With the implementation of the emission reduction measures included in this Plan, Solid Waste/landfill emissions will be reduced by 58 percent from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately 29 percent lower than 2007 emissions.

R1 Waste Measures

The CARB AB32 Scoping Plan recommends three measures for reducing emissions from Municipal Solid Waste at the State level, including: 1) landfill methane control; 2) increase the efficiency of landfill methane capture; and 3) high recycling/zero waste. CARB is in the process of developing a discrete early action program for methane recovery (1), likely to be adopted in early 2010. This measure is expected to result in a 1.0 MMTCO₂e reduction by 2020. Other measures proposed by CARB include increasing efficiency of landfill methane capture (2) and instituting high recycling/zero waste policies (3). Potential reductions associated with these measures are still to be determined. CARB estimates a preliminary one-time cost for adoption of these measures to be approximately \$70 per ton of CO₂ reduced. Capital cost is estimated to be approximately \$3,440,000 and annual operation cost is estimated to be approximately \$706,400 per landfill. Total industry cost estimates will be evaluated further in the staff report for the landfill methane control measure⁶³.

⁶³ Air Resources Board 2008b, 2009b

The County-owned landfills may already meet the majority of the requirements of the proposed landfill regulation. Large landfills such as Landers and Barstow will likely require monitoring and annual review to ensure the proper operation of their methane controls⁶⁴. All other landfills evaluated in the External Inventory also appear to be either meeting the requirements of the landfill methane control measure or are not subject to them, and it is anticipated that this measures will not result in any additional reductions for these landfills. These conclusions should be reassessed after finalization of the proposed landfill regulation.

The high recycling/zero waste measure is expected to result in GHG emissions reductions by reducing the substantial energy use associated with the acquisition of raw materials in the manufacturing stage of a product's life-cycle. As virgin raw materials are replaced with recyclables, a large reduction in energy consumption should be realized. Implementing programs with a systems approach that focus on consumer demand, manufacturing, and movement of products will result in the reduction of GHG emissions and other co-benefits. The potential 2020 GHG emission reductions attributed to this measure are estimated to be nine (9) MMTCO₂e⁶⁵. According to the CARB, some of the GHG "lifecycle" reductions may occur outside of California, making accounting more difficult, and additional research to quantify these emission reductions is needed⁶⁶. Consequently, these reductions are not counted toward the AB 32 goal and were not counted as R1 reductions for the County.

All future emission reductions do not take into account the GHGs associated with recycling or composting the materials that have been diverted from the landfill.

R2 Waste Measures

This section describes the methodology used to calculate GHG emission reductions for those measures that have been implemented or will be implemented; resulting in GHG reductions for the municipal solid waste management sector and require County action. Measures R2W1 and R2W2 below are based on reductions achieved from applying methane recovery technology to specific landfills. Only active landfills with a capacity of greater than three (3) million cubic yards were evaluated because methane recovery at smaller landfills is not likely to be cost-effective. Emission reductions from recovery at the smaller landfills are likely less than five (5) percent of the reductions from recovery at the larger landfills. Measures R2W4 to R2W7 are associated with the displacement of waste prior to landfilling. For these measures, only GHG reductions attributed to avoided methane emissions at the landfill site (rather than emissions associated with all lifecycle stages) are considered for reduction potential in the County's inventory because the emissions occurring at the landfills are under the County's direct control.

Measures R2W4 to R2W7 are associated with the displacement of waste prior to landfilling. For these measures, only GHG reductions attributed to avoided methane emissions from waste in the landfill are considered for reduction potential in the County's inventory because these emissions are completely under the County's control. However, the total lifecycle emissions associated with these measures were also evaluated with the USEPA Waste Reduction Model (WARM) to demonstrate the global reduction potential of these measures. WARM is used to calculate GHG emissions of baseline and alternative waste management practices, including: source reduction, recycling, combustion, composting, and landfilling. The WARM tool's lifecycle approach

⁶⁴ Information received from the County Solid Waste Department

⁶⁵ Air Resources Board 2007.

⁶⁶ Air Resources Board 2008a.

reflects emissions and avoided emissions, both upstream and downstream from the point of use (i.e., when and where the material/product is used). Therefore, the emission factors provided in this tool provide an accounting of the net benefit of these actions to the environment. Emissions factors are based on national averages for each process⁶⁷.

Each measure below accounts for emission reductions already attributed to R1 measures for this sector, and any applicable R2 measures.

R2W1: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills

Mid-Valley, Milliken, and Colton Landfills have the most waste-in-place (WIP) of any landfills under County control. In addition, these three landfills are currently accepting most of the new waste generated by incorporated cities in the County. Consequently, the WIP in these landfills represent the largest sources of methane from the solid waste sector. In 2007, these landfills accepted over one million tons of waste, representing 67 percent of all new waste landfilled in San Bernardino County⁶⁸. Because these landfills are so important to the County’s solid waste system, increasing methane recovery at these sites will have the greatest effect on reducing methane emissions from this sector.

This measure requires the County to achieve a methane recovery rate of 95 percent at Mid-Valley and 85 percent at Colton and Milliken Landfills. These landfills currently have methane recovery systems in place⁶⁹. The USEPA recommends using a 75 percent capture rate as a default value for methane recovery systems where the precise capture rate is unknown⁷⁰. Increasing the methane recovery rate will result in methane emission reductions from both WIP and newly landfilled waste. Multiple studies were reviewed to determine the achievable methane recovery rate for current advanced methane control technology for landfills. A 1999 study from the Institute for Environmental Management demonstrated that methane capture effectiveness approached 100 percent at a Yolo County landfill project through the use of a surface membrane cover over porous gas recovery layers operated at a slight vacuum⁷¹. Synthetic/geomembrane final covers have been shown to be very efficient at reducing methane emissions. A 2008 study by the California Integrated Waste Management Board found that they have a high potential for GHG emission reductions⁷², and a 2006 study demonstrated 90 percent recovery⁷³.

A cost and technology feasibility study must be performed to determine the methane capture and destruction rates for any methane controls installed at these landfills. This study is necessary to determine the feasibility of installing methane control technology, and the maximum possible methane recovery rate achievable at each landfill. As discussed above, the methane capture rates used in this analysis reflect relevant studies of similar landfill sites, accepted methodology, and current landfill data.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The methane recovery systems currently in place are assumed to capture 75 percent of emitted methane from all waste currently in place, and all new waste disposed of at Mid-

⁶⁷ Environmental Protection Agency 2008b.

⁶⁸ California Integrated Waste Management Board 2008.

⁶⁹ Environmental Protection Agency 2008c.

⁷⁰ Environmental Protection Agency 1998.

⁷¹ Augenstein 1999.

⁷² California Integrated Waste Management Board 2008b.

⁷³ Spokas et al. 2006; Australian Greenhouse Office 2007.

Valley, Milliken, and Colton Landfills by 2020⁷⁴.

- The recommended methane recovery systems included in this analysis are assumed to capture 95 percent of emitted methane from all WIP and all new waste disposed of at Mid-Valley, and 85 percent of emitted methane from all WIP and all new waste disposed of at Milliken, and Colton Landfills by 2020.

The reductions are estimated at 49,972 MTCO₂e in 2020 from waste already in place at the landfills. The emission reductions associated with new waste added to the landfills result in 47,087 MTCO₂e by 2020. This measure will result in a 27.0 percent reduction from 2020 unmitigated landfill emissions.

R2W2: Install Methane Recovery System at Barstow

Due to the safety issues associated with methane, the California Code of Regulations (CCR), Title 27, Chapter 3, Subchapter 4, Article 6, contains requirements that owners and operators of landfills must monitor and control landfill gas (LFG) (mostly methane) and prevent it from accumulating in enclosed structures and/or migrating offsite. To meet the requirements of Title 27, the County installed methane recovery system at Barstow Landfill 2010⁷⁵.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The methane recovery system is assumed to capture 75 percent of emitted methane from all waste currently in place, and all new waste entering Barstow Landfill by 2020⁷⁶.
- An overall increase of six percent (i.e., 90 to 96 percent) for the delivery of waste to sites with a methane recovery system in place will occur between 2007 and 2020.
- Measure R2W1 has been implemented.

In 2020, the reductions associated with the Barstow site are estimated at 10,970 MTCO₂e from waste already in place at the landfill. The emission reductions associated with new waste result in 37,935 MTCO₂e by 2020. This measure will result in a 10.1 percent reduction from 2020 unmitigated landfill emissions.

R2W3: Install Methane Recovery System at Landers

The County can further reduce emissions by installing a methane recovery system at Landers. Because Landers is scheduled to close by 2013, the waste reduction calculation for this facility is based only on waste currently in place and that a negligible amount of new waste, in relation to the waste in place, would be disposed of at Landers.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The methane recovery system is assumed to capture 75 percent of emitted methane from all waste currently in place⁷⁷.
- In 2020, 96 percent of waste will be disposed of in landfills with methane recovery systems.

⁷⁴ Environmental Protection Agency 1998

⁷⁵ Pers. com. County of San Bernardino Solid Waste Management Department

⁷⁶ Environmental Protection Agency 1998

⁷⁷ Environmental Protection Agency 1998.

In the year 2020, the reductions associated with the Landers site are estimated at 8,471 MTCO₂e. This measure will result in a 2.4 percent reduction from 2020 unmitigated landfill emissions.

A cost and technology feasibility study must be performed to determine the methane capture and destruction rates for any methane controls installed at this landfill. This study is necessary to determine the feasibility of installing methane control technology, and the maximum possible methane recovery rate achievable at the landfill. As discussed above, the methane capture rates used in this analysis reflect relevant studies of similar landfill sites, accepted methodology, and current landfill data.

R2W4: Comprehensive Disposal Site Diversion Program

The County's Comprehensive Disposal Site Diversion Program (CSDSP) recovers "post-diversion" waste for recycling at the landfill. Post-diversion is defined as the waste sent to landfill, after accounting for the County's municipal recycling and composting programs, which are accounted for in the 2020 total waste estimates. This program has been quite successful at increasing waste diversion from landfilling to recycling since its inception in 2006; the County successfully diverted 112,846 tons of waste in fiscal year 2007-2008 fiscal year. By 2020 the CSDSP program will divert an estimated 11 percent of waste arriving at County landfills each year, increasing the current per capita diversion rate from 49 percent to approximately 54.5 percent.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Projected diversion rates grow at a rate of 1.02 percent annually.
- In 2020, 100 percent of new waste will be disposed of in landfills with methane recovery systems (after Measures R2W1 through R2W3 have been implemented).
- Measures R2W1 through R2W3 have been implemented.

As described above, only emission reductions directly attributed to waste diversion from landfills are considered for reduction potential in the County's internal operations inventory. These emission reductions for the County's CSDSP are equivalent to 13,137 MTCO₂e in 2020. However, after implementation of measures R2W1 through R2W3, 100 percent of new waste will be disposed of in landfills with methane recovery systems. This results in additional reductions of 13,253 MTCO₂e in 2020. This measure will result in a 7.3 percent reduction from 2020 unmitigated landfill emissions.

For informational purposes, WARM was used to evaluate total lifecycle emissions associated with this measure. WARM was used to calculate GHG emissions of baseline and alternative waste management practices associated with the CSDSP, including recycling and composting, with San Bernardino County-specific waste disposal totals and appropriate assumptions regarding collection efficiency. Waste disposal categories for San Bernardino County provided by the California Integrated Waste Management Board (CIWMB) in 1999 (CIWMB 1999). The lifecycle reductions associated with the CSDSP program are estimated at 452,508 MTCO₂e for the year 2020. Because many of the processes associated with the waste emissions are not in San Bernardino County and/or are not under County control, the full lifecycle emissions reductions were not counted in the CSDSP reduction measure.

R2W5: Construction and Demolition Debris Diversion

Under AB2176, § 42911, a local agency shall not issue a building permit to a development project unless the development project provides adequate areas for collecting and loading recyclable materials and ensures a minimum diversion of 50 percent of construction and building materials and demolition debris from landfills. In San Bernardino County, existing construction and demolition (C&D) is currently permitted on a case by case basis. Building permits are issued conditionally based on the C&D recycling and waste management plan. Under this plan, a minimum estimate of 50 percent diversion is required as is a detailed diversion plan with the waste hauler identified and a plan verification before every permit is issued. The County could further reduce emissions from construction and demolition waste by increasing the diversion requirements.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Starting in 2009, diversion increases by one (1) percent per year to reach ten (10) percent total diversion in 2020.
- The ten (10) percent C&D diversion target is constant in 2020.
- C&D accounts for approximately 8.5 percent of San Bernardino County's average waste composition⁷⁸.
- On average, the County currently meets the 50 percent requirement for C&D.
- In 2020, 100 percent of waste will be disposed of in landfills with methane recovery systems.
- Measures R2W1 through R2W4 have been implemented.

Diverting an extra ten (10) percent of this C&D waste would result in a reduction of 295 MTCO₂e in 2020. This measure will result in a 0.08 percent reduction from 2020 unmitigated landfill emissions.

For reference, lifecycle emissions were calculated with WARM, using the same methodology and assumptions described for prior measures. Reduction of the full lifecycle emissions would result in a reduction of 64,199 MTCO₂e in 2020.

R2W6: County Diversion Program: 75 percent Diversion Goal

This measure involves the County's commitment to strengthen its Diversion Program to reach a goal of 75% of waste diverted to recycling programs by 2020 through the implementation of one or more of the following measures:

- Expand current waste reduction and recycling plans, including outreach and education programs.
- Encourage businesses in the County to adopt a voluntary procurement standard prioritizing products that have less packaging or are re-usable, recyclable, or compostable; support policies at the State level that provide incentives for efficient product design and for reduced product and packaging waste.
- Increase disposal fees and/or reduce residential pick-up frequency.

⁷⁸ California Integrated Waste Management Board 2007.

- Provide compost bins at no cost.
- Expand list of recyclable materials.
- Provide waste audits.
- Make recycling and composting mandatory at public events.
- Establish an appliance end-of-life requirement.
- For new development, require the use of salvaged and recycled-content materials and other materials that have low production energy costs for building materials, hard surfaces, and non-plant landscaping. Require sourcing of construction materials locally, as feasible. Encourage the use of cement substitutes and recycled building materials for new construction.
- Research, evaluate, and report on best practices, innovations, trends, and developments in waste reduction practices, as relevant to GHG emissions reduction.

It is estimated that the County could achieve a 75 percent diversion rate by 2020, which would be an increase of approximately 25 percent from diversion measures currently underway (i.e., measures R2W3 and R2W4). The County is faced with unique challenges regarding waste diversion targets due to the rural nature of its populated areas and its socioeconomic conditions. Many of the small population centers are spread over a large geographical area in the County. In addition, illegal dumping at landfills has been a problem in the past, and it is anticipated that increasing tipping fees to help achieve the waste diversion goal could also increase the rate of illegal dumping. Given these challenges, the County will need to further assess the feasibility of achieving the 75 percent diversion goal by 2020.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Starting in 2009, diversion increases by two (2) percent per year to reach 75 percent total diversion in 2020.
- In 2020, 100 percent of new waste will be disposed of in landfills with methane recovery systems
- Measures R2W1 through R2W5 have been implemented.
- An additional cumulative 25 percent increase in diversion to achieve a 2020 total diversion goal of 75 percent would result in an additional reduction of 4,118 MTCO₂e in 2020. This measure will result in a 1.1 percent reduction from 2020 unmitigated landfill emissions.
- These estimates do not include reduction in life cycle emissions. For reference, lifecycle emissions were calculated with WARM, using the same methodology and assumptions described for prior measures. Reduction of the full lifecycle emissions would result in a total reduction of 313,514 MTCO₂e in 2020.

R2W7: City Diversion Program: 75 percent Diversion Goal for Incorporated County-Generated Waste

The incorporated areas of the County currently divert approximately 55 percent of generated waste. This measure would result in increasing that diversion percentage to 75 percent. The County will work with the various cities in the County to implement programs to reduce waste

generation and increase waste diversion. Programs that can be implemented to achieve this goal are outlined under measure R2W6.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Starting in 2009, diversion increases by approximately two (2) percent per year to reach 75 percent total diversion in 2020.
- Approximately 94 percent of waste disposed of by the incorporated areas of the County is landfilled within County borders; consequently, 94 percent of emission reductions will occur inside the County, and six (6) percent will occur outside⁷⁹.
- The percentage waste disposal at sites with methane capture in the incorporated County is equal to that for the unincorporated County: 100 percent of new waste will be disposed of in landfills with methane capture.
- Measures R2W1 through R2W6 have been implemented.
- An additional cumulative 20 percent increase in diversion to achieve a 2020 total diversion goal of 75 percent for the incorporated County would result in an additional reduction of 32,692 MTCO_{2e} in 2020. This measure will result in a 9.1 percent reduction from 2020 unmitigated landfill emissions.

R3 Waste Measures

The following list of R3 measures includes all additional measures that were not relied upon to demonstrate achievement of the proposed County 2020 emissions target. These measures are either facilitative in nature or there are methodological issues that prevent their quantification at this time.

R3W1: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP

The County will explore the feasibility of installing methane recovery systems at all landfills with 250,000 or more tons of WIP. The County will also explore the feasibility of providing technical support to encourage the installation of methane recovery systems at private landfills within the County. This includes the following County-owned and private landfills:

- Apple Valley (closed/County)
- Big Bear (closed/County)
- Hesperia (closed/County)
- Yucaipa (closed/County)
- Mitsubishi Cement Plant Cushenbury (active/private)

A cost and technology feasibility study must be performed to determine the potential methane capture and destruction rates for any methane controls installed at these landfills. This study is necessary to determine the feasibility of installing methane control technology, and the maximum possible methane recovery rate achievable at each landfill. It is possible that methane capture and destruction at these landfills is not feasible because smaller landfills are typically remote, have no power supply, and produce poor gas. The systems may need to run off of a

⁷⁹ California Integrated Waste Management Board 1999.

generator and methane flares would likely require additional gas to ensure flare operation and methane destruction.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Each methane control system has an efficiency of 75 percent.

This measure could result in an additional reduction of 14,995 MTCO_{2e} in 2020 and a 4.2 percent reduction from 2020 unmitigated landfill emissions.

Reductions associated with this measure have not been included in the reduction plan because this measure has not been analyzed for cost-effectiveness. In addition, the County does not have jurisdiction to install a methane recovery system at Mitsubishi Cement Plant Landfill but could provide technical support to this landfill owner.

R3W2: Financing Mechanisms and Opportunities

The County will pursue all appropriate grant opportunities to help finance the installation of methane recovery systems and controls, the enhancement of waste diversion programs and public education programs focused on waste stream issues.

While financing is vital to implementing water minimization, methane control and reuse described above, it was not assumed that financing would result in a level of GHG reductions beyond that assumed in the R2 measures described above.

R3W3: Waste Education Program

This measure involves providing public education and publicity about commercial and residential recycling, waste reduction, composting, grass cycling, and waste prevention. This measure would educate the local population about waste management and waste reduction options applicable to both residential and commercial settings. Although the County currently offers community education programs designed to assist residents with waste reduction, recycling and reuse activities, this measure would expand the County's current programs.

This measure is not expected to result in additional emission reductions beyond those already claimed in R2W7, because education programs are relied upon to achieve the 75 percent diversion goal

R3W4: Additional Landfill Methane Controls

The County's Municipal Solid Waste Department is currently in the process of assessing the feasibility of installing additional methane capture systems. The following actions are being considered that could further reduce methane emissions from landfills in the County:

- Use landfill gas extraction system, surface sampling, gas migration probe, and other available data to get an accurate representation of methane generation at San Bernardino County landfills. This information could be used to accomplish the following:
 - Develop a GHG emission site priority list.
 - Develop strategies based on site priorities.
 - Install additional gas extraction wells as necessary in existing systems.
 - Pursue low tech solution at remote sites that do not have a power source.
- Pursue further study of the chemical reactions of methane gas attenuation as it migrates

through the cover soils at each landfill, and develop low power methods for improving these reactions.

- Work with other agencies that are studying GHG emissions from landfills and develop partnerships where information and approaches are shared.
- Further develop waste disposal alternatives such as recycling, waste-to-energy, aerobic digestion of organic materials, and other actions.

Until the feasibility assessment is complete, the amount of potential GHG reductions from this measure cannot be quantified.

R3W5: Landfill Gas to Energy Projects

The County's Municipal Solid Waste Department currently has Landfill Gas to Energy (LFGE) Projects at the Colton, Mid Valley, and Milliken landfills. These projects have the capacity to generate a combined six (6) MW of renewable electricity, and it is estimated that they have produced over 220 MWh of electricity in the first five (5) years of their operation (all three projects came online in 2003). These projects are funded by the California Energy Commission's Renewable Energy Program. The LFGE projects sell their electricity to Southern California Edison (SCE), where it is distributed throughout the County. This electricity is part of SCE's renewable power portfolio and is therefore already incorporated into the indirect emissions associated with electricity consumption included in this inventory. Consequently, emission reductions directly attributed to offsets in non-renewable energy resulting from these projects have not been included in this emission reduction plan. However, methane captured and combusted to produce electricity has been subtracted from the landfill emissions presented in this inventory.

The County will consider pursuing additional LFGE projects at other landfills where the projects are cost-effective and technologically feasible. Through this measure, these projects would increase the renewable electricity available in the County, reduce GHG emissions associated with non-renewable electricity use, and reduce methane emissions that would otherwise be released into the atmosphere.

Until the feasibility assessment is complete, the amount of potential GHG reductions from this measure cannot be quantified.

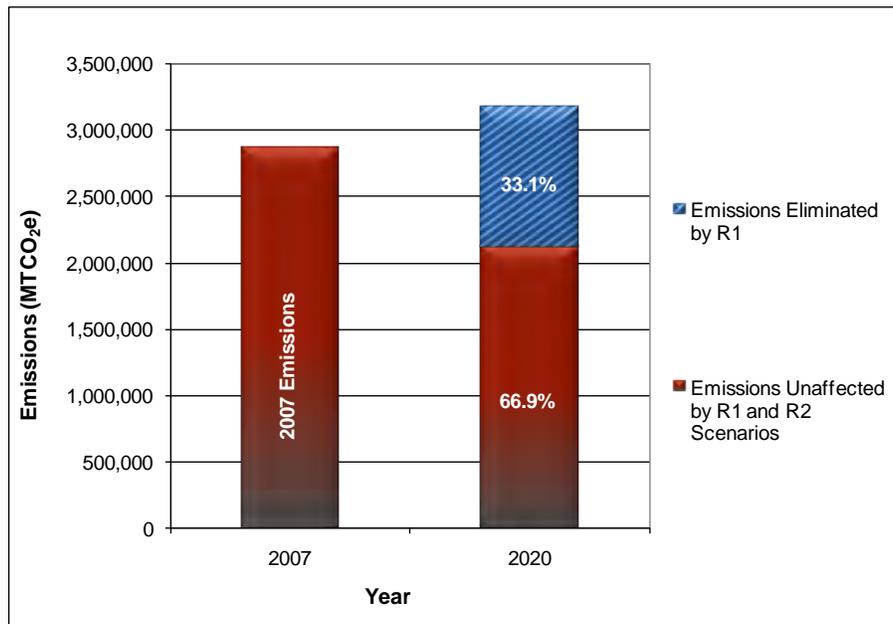
Stationary Source Measures

This section provides information on calculations of GHG emission reductions related to R1 and R2 for industrial fuel combustion for the County. These emission reductions do not include measures that reduce natural gas combustion in the industrial sector; they only include reductions attributed to combustion associated with other fuels, such as diesel and propane, and reduction in fugitive process emissions, such as CO₂ released during cement manufacture. Total estimated GHG percent reductions and quantities from the reduction measures included in Reduction Classifications R1 and R2 are presented below in **Table A-21**.

Table A-21. External GHG Emission Reductions from Stationary Source Measures

Reduction Classification and Reduction Measure	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional stationary source measures that do not require County action		
R111: Oil and Gas Extraction Combustion Related GHG Emission Reduction	49	0.002
R112: Stationary Internal Combustion Engine electrification	736	0.02
R113: Reduction in Carbon Intensity at Cement Plants (Through Cap and Trade Program)	69,909	2.2
R114: Reduction in Carbon Intensity at Concrete Batch (Through Cap and Trade Program)	732,086	23.1
R115: Waste Reduction in Concrete Use (Through Cap and Trade Program)	246,288	7.8
R2: Existing and new stationary source measures that require County action		
N/A		
Total	1,049,067	33.1

Figure A-8. External GHG Emission Reductions from Stationary Sources



With the implementation of the emission reduction measures included in this Plan, stationary source emissions will be reduced by 33 percent from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately 28 percent lower than 2007 emissions.

R1 Stationary Source Measures

This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* national, state, or regional industrial fuel combustion measures that will result in future GHG reductions for the stationary source sector and do not require significant County action.

The cement facility reductions evaluated in this plan include reductions in the cement/concrete sector expected due to the state cap and trade program (R1I3, R1I4, R 1I5).

R1I1: Oil and Gas Extraction Combustion Related GHG Emission Reduction

This AB 32 measure would reduce combustion emissions from oil and gas extraction. By 2020, this requirement will reduce emissions in California by approximately 1.8 MMTCO_{2e}, representing 13 percent of combustion emissions from oil and gas extraction in the State⁸⁰. San Bernardino County has very little Oil and Gas production and reductions are minor.

This regulation will result in a 13 percent reduction from 2020 unmitigated combustion emissions from oil and gas extraction and a 0.001 percent reduction of total 2020 unmitigated industrial stationary source emissions.

⁸⁰ California Air Resources Board 2008a, 2009a. CARB assumes a 2 percent growth rate in cement production from 2004 (11.92 MMT) to 2020. Projected 2020 emissions were calculated as follows: $0.895 * (11.92) * (1.02)^{16} = 14.65 \text{ MMTCO}_2\text{e}$.

R112: Stationary Internal Combustion Engine Electrification

This AB 32 measure would affect owners and operators of industrial and commercial engines over 50 horsepower used as primary power sources by replacing internal combustion engines with electric motors. By 2020, this requirement will reduce emissions in California by approximately 0.3 MMTCO₂e, representing 0.5 percent of combustion emissions from industrial sources (non-coal) in the State⁸¹.

This regulation will result in a 0.5 percent reduction from 2020 unmitigated combustion emissions from industrial sources and a 0.02 percent reduction of total 2020 unmitigated industrial stationary source emissions.

R113: Reduction in Carbon Intensity for Cement Manufacturing

ARB is planning to implement a cap and trade program that will include the cement sector and will incentivize reduction in carbon intensity in cement manufacturing.

During development of the AB 32 Scoping Plan, ARB originally evaluated an approach to mandate reduction in carbon intensity at cement plants. By 2020, this requirement would have reduced emissions in California by approximately 1.55 MMTCO₂e; representing 10.6 percent of total emissions for California cement plants in 2020⁸². This requirement would have required a carbon intensity standard (CIF) of 0.8 metric ton CO₂ per metric ton of cement used in California. The unmitigated CIF for cement produced in California is 0.895. Reduction of carbon intensity would be through use of alternative fuels or energy efficiency measures. Based on data from ARB, the CIF for cement produced in the County is 0.819, which is slightly above the originally proposed standard.

ARB ultimately decided that reducing greenhouse gas emissions from the wide variety of sources could be best be accomplished through a cap-and-trade program along with a mix of complementary strategies that combine market-based regulatory approaches, other regulations, voluntary measures, fees, policies, and programs. Thus, ARB decided to address cement manufacturing emissions through the cap and trade program instead of via a specific mandate. ARB will monitor cement manufacturing emissions and other emissions to ensure that the State meets the 2020 limit on greenhouse gas emissions. Thus, cap-and-trade will be the first approach to promoting reductions in the cement industry, but ARB will retain the authority (given to it by AB32) to later evaluate whether specific cement industry GHG regulation (such as a cement intensity standard like that mentioned above) should be instituted as a complementary measure. Thus, although it is difficult to precisely predict the changes in the cement carbon intensity that will occur due to cap-and-trade, change something along the lines of that assumed in the original cement intensity standard would be necessary to support reaching the overall AB 32 reduction target.

Thus it was assumed that cap and trade would result in a reduction in cement manufacturing emissions equivalent to that which would have resulted from implementation of a fixed carbon intensity standard which is a 2.3 percent reduction from 2020 unmitigated cement plant emissions and a 2.1 percent reduction of total 2020 unmitigated industrial stationary source emissions.

⁸¹ California Air Resources Board 2008a, 2009a.

⁸² California Air Resources Board 2008a, 2009a.

RII4: Reduction in Carbon Intensity for Concrete Batch Plants

CARB is planning to implement a cap and trade program that will include the concrete sector and will incentivize reduction in carbon intensity for concrete production.

During development of the AB 32 Scoping Plan, ARB originally evaluated an approach to mandate reduction in carbon intensity at concrete batch plants. By 2020, this requirement would have reduced emissions in California by approximately 3.3 MMTCO₂e; representing 22.3 percent of total emissions for California cement plants in 2020⁸³. This measure would have required a CIF of 0.6 metric ton CO₂ per metric ton of cementitious material used. As noted above, ARB had originally proposed a separate CIF for cement produced in California of 0.8. Further reductions in the CIF for concrete batch plants can be achieved by using alternative fuels, increasing energy efficiency in the cement production process, or by adding materials such as supplementary cementitious materials (SCMs) to replace cement in the concrete blend.

As noted above, ARB decided to include the concrete sector in the cap and trade program instead of proposing a fixed CIF standard for concrete production. ARB will monitor concrete production emissions and other emissions to ensure that the State meets the 2020 limit on greenhouse gas emissions. Thus, cap-and-trade will be the first approach to promoting reductions in concrete production, but ARB will retain the authority (given to it by AB32) to later evaluate whether specific regulation (such as a cement intensity standard like that described above) should be instituted as a complementary measure. Thus, although it is difficult to precisely predict the changes in the concrete production carbon intensity that will occur due to cap-and-trade, change something along the lines of that assumed in the carbon intensity standard would be necessary to support reaching the overall AB 32 reduction target.

Thus it was assumed that cap and trade would result in a reduction in cement manufacturing emissions equivalent to that which would have resulted from implementation of a fixed carbon intensity standard which would result in a 25.0 percent reduction from 2020 unmitigated cement plant emissions and a 21.8 percent reduction of total 2020 unmitigated industrial stationary source emissions.

RII5: Waste Reduction in Concrete Use

As noted, above, CARB is planning to implement a cap and trade program that will include the cement sector and will incentivize reduction in carbon intensity for cement production.

During development of the AB 32 Scoping Plan, ARB originally evaluated an approach to mandate waste reduction for cement production. This measure would reduce emissions from cement production at cement plants in California. By 2020, this requirement would have reduced emissions in California by approximately 1.2 MMTCO₂e; representing eight (8) percent of emissions from cement production in the State⁸⁴. According to the ARB, approximately five (5) to eight (8) percent of concrete made in California each year is returned to the cement plant waste. This measure requires a 100 percent reduction in wasted cement, which is equivalent to an eight (8) percent reduction in cement manufacturing.

As noted above, ARB decided to include the cement sector in the cap and trade program instead of proposing a fixed waste reduction mandate. ARB will monitor cement manufacturing

⁸³ California Air Resources Board 2008a, 2009a.

⁸⁴ California Air Resources Board 2008a, 2009a.

emissions and other emissions to ensure that the State meets the 2020 limit on greenhouse gas emissions. Thus, cap-and-trade will be the first approach to promoting reductions in cement production, but ARB will retain the authority (given to it by AB32) to later evaluate whether specific regulation (such as a waste reduction mandate described above) should be instituted as a complementary measure. Thus, although it is difficult to precisely predict the changes in the cement carbon intensity that will occur due to cap-and-trade, change something along the lines of that assumed in the originally proposed waste reduction measure would be necessary to support reaching the overall AB 32 reduction target.

Thus it was assumed that cap and trade would result in a reduction in cement manufacturing emissions equivalent to that which would have resulted from implementation of a waste reduction mandate which would result in an eight (8) percent reduction from 2020 unmitigated cement plant emissions and a 7.2 percent reduction of total 2020 unmitigated industrial stationary source emissions.

R2 Stationary Source Measures

There are currently no R2 measures that were evaluated for industrial fuel combustion, because the County may have limited control over this sector, other than its land use authority over new Stationary Source development projects. Emission reductions related to new stationary source development will be accomplished through the County's DRP.

R3 Stationary Source Measures

No R3 measures are identified for this sector.

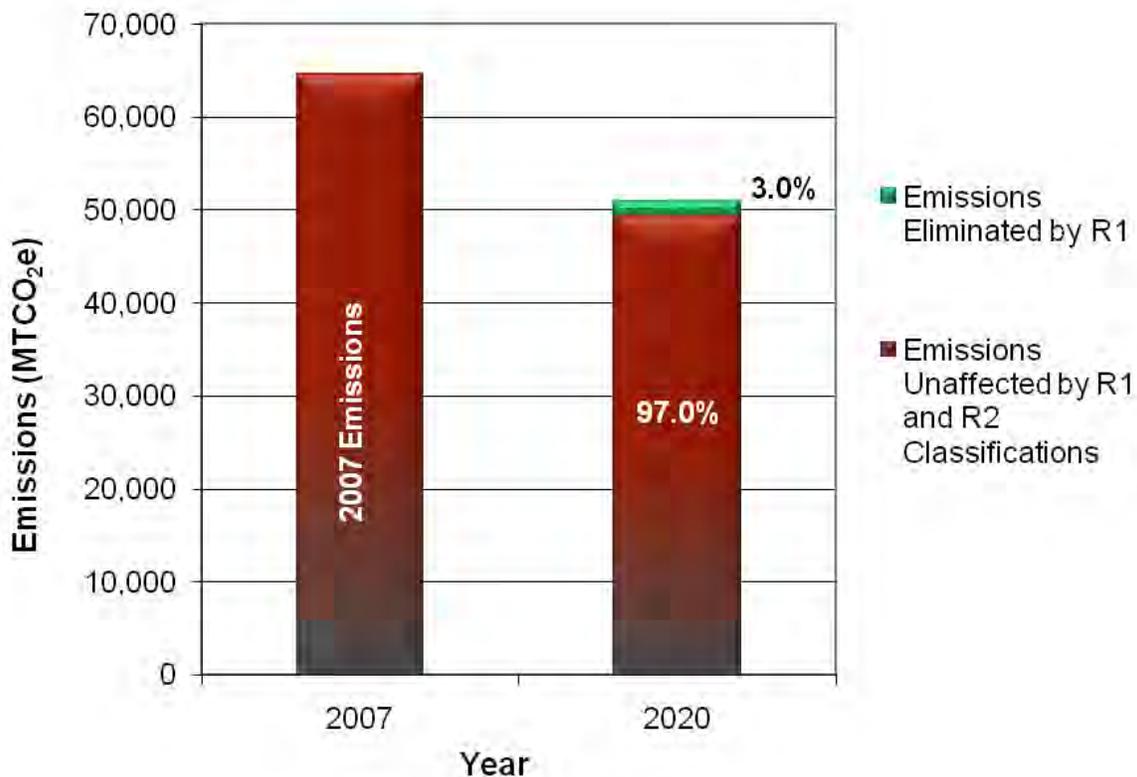
Agriculture

This section provides information on calculations of GHG emission reductions related to R1 and R2 for agriculture in the County. Total estimated GHG percent reductions and quantities from the reduction measures included in Reduction Classifications R1 and R2 are presented below in **Table A-22**. Emission reductions for each measure are applied to the projected 2020 unmitigated emissions for the appropriate emissions source. Total reductions attributed to these measures from the 2020 unmitigated emissions would be three (3) percent.

Table A-22. External Emission Reductions from Agriculture Measures

Reduction Classification and Reduction Measure	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional stationary source measures that do not require County action		
R1A1: Methane Capture at Large Dairies	1,531	3.0
R2: Existing and new agriculture measures that require County action		
NA		
Total	1,531	3.0

Figure A-9. External GHG Emission Reductions from Agriculture Measures



2020 unmitigated emissions estimates from agriculture show a decrease in emissions from 2007. This is a result of decreasing agricultural activity in the County. The 2020 mitigated agriculture emissions will be approximately 24 percent lower than 2007 emissions.

R1 Agriculture Measures

This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* national, state, or agriculture measures that will result in future GHG reductions for the agricultural sector and do not require significant County action.

RIA1: Methane Capture at Large Dairies

This is an AB 32 voluntary measure to encourage the installation of methane digesters to capture methane emissions at large dairies. By 2020, this requirement will reduce emissions in California by approximately one (1) MMTCO₂e, representing 7.8 percent of CH₄ and N₂O emissions from manure management and enteric fermentation at dairies in the State⁸⁵.

This regulation will result in a 7.8 percent reduction from 2020 unmitigated CH₄ and N₂O emissions from manure management and enteric fermentation at dairies and a three (3) percent reduction of total 2020 unmitigated agricultural emissions.

R2/R3 Agricultural Measures

There are currently no R2 or R3 measures that were evaluated for agriculture, because the County may have limited control over this sector, other than its land use authority over new agricultural development projects. Emission reductions related to new agricultural development will be accomplished through the County's DRP.

⁸⁵ California Air Resources Board 2008a, 2009a.

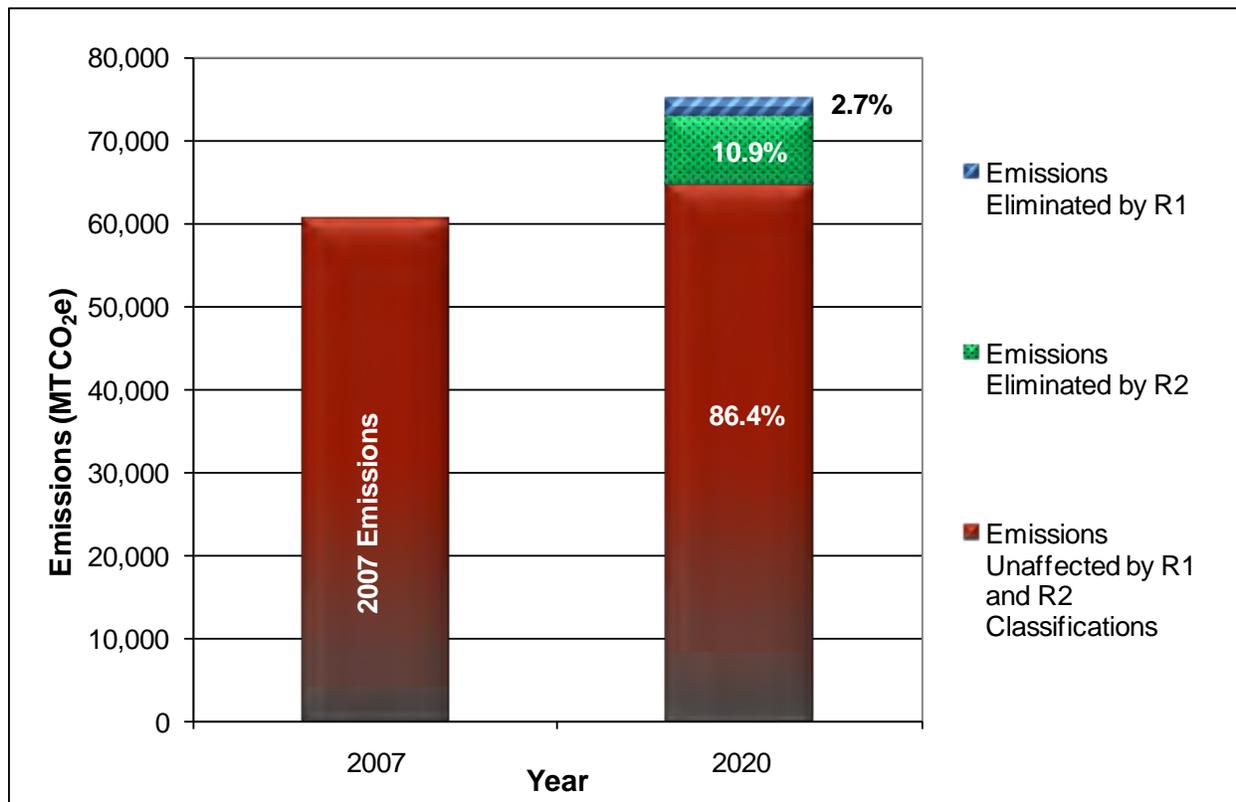
Water Conservation Measures

This section provides information on calculations of GHG emission reductions related to R1 and R2 measures for water conservation. Because reduction of water use reduces water conveyance as well as water treatment, measures in this sector reduce emissions from both the water conveyance and wastewater treatment sectors.

Table A-23. External GHG Emission Reductions from Water Supply Measures

Reduction Classification and Reduction Measure	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional water supply measures that do not require County action		
R1WC1: Renewable Portfolio Standard (33 percent by 2020)	2,007	15.2 (water conveyance)
R2: Existing and new water supply measures that require County action*		
R2WC1: Per Capita Water Use Reduction	2,228	
Electricity within County	2,241	20.0 (water conveyance)
Electricity outside of County	1,109	20.0 (water conveyance)
Wastewater Treatment Fuel Combustion		0.03 (industrial fuel combustion)
Wastewater Fugitive Emissions	2,608	
Subtotal	8,186	7.3 (wastewater fugitive emission)
Total	10,193	13.6
R3: Existing and new water supply measures—reductions not quantified or relied upon to achieve reduction goal		
R3WC1: Manage Storm Water Runoff		
R3WC2: Conservation Areas		
R3WC3: Financing Mechanisms and Opportunities		
* Reductions assume measure will effect water importation from the State Water Project only. The County's mandatory influence is for new development; impact on existing development must come through voluntary measures in cooperation with water providers.		

Figure A-10. External GHG Emission Reductions from Water Conservation Measures



With the implementation of the emission reduction measures included in this Plan, emissions from water supply and treatment emissions will be reduced approximately 14 percent from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately 8 percent higher than 2007 emissions.

R1 Water Conservation Measures

SB X7 7 (Steinberg) of 2009 mandates a reduction in per capita urban water use by 20 percent compared to current conditions. This mandate applies specifically to urban water retailers with more than 3,000 connections. Although this is a state mandate, in order to achieve substantial per capita water use reductions, the implementation of this mandate will be at the local level and the County can play a substantive role in helping to promote water conservation. As such, GHG reductions related to water conservation are quantified as a R2 measure.

CARB outlines six water-related measures that total 4.8 MMTCO₂e in reductions by 2020 at the state level. These measures are partly included in the energy efficiency measure outlined in the Scoping Plan. According to CARB, reductions associated with these measures may already be incorporated into the unmitigated 2020 forecast; therefore, they were not included in the Scoping Plan as reductions attributed to the State-wide 2020 goal. CARB plans to work with the appropriate agencies to determine whether these emission reductions are additional to the reductions already accounted for in the Scoping Plan⁸⁶.

⁸⁶ California Air Resources Board 2008a, 2009a.

R1WC1: Renewable Portfolio Standard (33 percent by 2020) Related to Water Supply and Conveyance

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 MMTCO₂e, representing 15.2 percent of emissions from electricity generation (in-State and imports). This reduction has been counted separately from emission reductions associated with electricity use in the County as a result of implementation of the Renewable Portfolio Standard (see Measure R1E1B). This regulation will result in a 15.2 percent reduction from 2020 unmitigated indirect electricity emissions from imported water supply and conveyance, or a total of 2,007 metric tons of CO₂e.

R2 Water Conservation Measures

This section describes the methodology used to calculate GHG emission reductions for the R2 measures that will result in future GHG reductions from water conservation. Total estimated GHG percent reductions and quantities from the reduction measures are presented below in **Table A-23**. Total reductions attributed to these measures from the 2020 unmitigated GHG emissions inventory are approximately 10,193 metric tons of CO₂e.

R2WC1: Per Capita Water Use Reduction

The County will support the achievement of the 20 percent per capita water use goal, with the County’s implementation of multiple reduction measures. These measures include, but are not limited to, the following (these measures have not been quantified individually, because doing so will require additional research into the feasibility of implementation and cost-effectiveness for each of the measures):

Reduction Strategies

- a. **County Water Efficient Landscape Ordinance.** In 2007, the County adopted a landscape ordinance that provided for the conservation and protection of water resources through the efficient use of water, appropriate use of plant materials suitable for climate and location, and regular maintenance of landscaped areas. On February 8, 2011, the Board of Supervisors adopted a comprehensive landscaping ordinance (Development Code Sections 83.10.010 et seq.) whose provisions meet or exceed the water conservation requirements development by the Department of water resources pursuant to Government Code Sections 64491 et seq. The County landscaping ordinance implements standards that manage outdoor water use through various conservation measures which include using a water budget and low impact development design strategies such as impervious surface reduction, pollution prevention measures to reduce the introduction of pollutants to the environment, and other integrated practices to reduce and cleanse runoff. This Legislative effort is aimed at meeting interdisciplinary goals such as protecting the County’s limited water supply, groundwater recharge, and storm water management.
- b. **Water Conservation Ordinance.** The County’s Special District Division manages and operates County Service Areas 42 (Ore Grande), 64 (Spring Valley Lake, Victorville) and 70, Improvement Zones CG (Cedar Glen), F (Little Morongo, near Yucca Valley), J (Oak Hills), W-1 (Landers), W-3 (Hacienda) and W-4 (Pioneer Town), that provide water services to county residents. In response to drought conditions that existed within these county service areas and improvement zones (Districts), the Board of Supervisors, acting in its capacity as

the governing body of the Districts, adopted ordinance No. SD 90-11, to preserve the water supply in those Districts. This water conservation ordinance prohibits excessive landscape watering, watering during peak daylight hours, watering non-permeable surfaces, excessive water use for noncommercial washing, water use resulting in run-off, and water leaks. The ordinance also requires efficient use of water for construction activities, low-flow toilets and showerheads for all new construction, the use of drought-tolerant plants and efficient landscape watering for all new development, pool covers, water conservation signage at hotels, and recycling of water used for cooling systems.

- c. **County Water Conservation Programs.** San Bernardino is implementing water conservation programs through public education and by partnering with conservation organizations to promote water conservation, highlighting specific water-wasting activities, such as watering non-vegetated surfaces and uncontrolled run-off, and using water to clean sidewalks. The Green County Initiatives program helps cities implement sustainable policies to reduce greenhouse gas emissions and conserve water. One such program is the Facilities Management Demonstration Garden, where the County is using water efficient landscaping to reduce its carbon footprint and water consumption. .
- d. **Collaboration with Water Purveyors.** The County will collaborate with water purveyors to implement and promote conservation programs and actions including:
 - o Water audit programs that offer free water audits to single family, multi-family, large landscape accounts and commercial customers; and
 - o Programs to install ultra-low-flush toilets in commercial, industrial and institutional facilities
- e. **Recycled Water Use.** The County will establish programs and policies to increase the use of recycled water which may include the following actions :
 - o Produce and promote the use of municipal wastewater and gray water that can be used for agricultural; industrial and irrigation purposes, including grey water systems for residential irrigation;
 - o Inventory potential non-potable uses of water for potential substitution by recycled and/or gray water;
 - o Assess feasibility of producing and distributing recycled water for groundwater replenishment;
 - o Collaborate with responsible agencies to encourage the use of recycled water where cost and energy efficiencies for its production, distribution and use are appropriate.
- f. **Water efficiency Training and Education.** The County will encourage water efficiency training and certification for irrigation designers and installers, property managers.

This measure will reduce emissions associated with electricity consumption for water conveyance and wastewater treatment. This measure was separated into three sub-measures for quantification purposes as described below.

Electricity Use Inside County Borders

The following assumptions were used to calculate emission reductions associated with electricity use inside the County for water conveyance attributed to this measure:

- Water treatment and distribution in Southern California require approximately 111 kWh and 1,272 kWh per million gallons⁸⁷.
- This measure would result in a 20 percent reduction in water treatment and distribution
- Projected water supply and electricity emission factors used for 2020 unmitigated emission estimates described in the water conveyance and buildings sections of the External Inventory.

This measure is estimated to result in a reduction from 2020 unmitigated total emissions of 2,228 metric tons of CO₂e.

Electricity Use Outside County Borders

The following assumptions were used to calculate emission reductions associated with electricity use outside the County for water conveyance attributed to this measure:

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would result in a 20 percent reduction in imported water.
- All imported water reductions are from the SWP, because the SWP has much higher embodied electricity emission factors per unit of water than the MWD.

This measure is estimated to result in a reduction from 2020 unmitigated total emissions of 2,241 metric tons of CO₂e after accounting for emission reductions attributed to R1WC1.

Industrial Fuel Combustion

This measure would also reduce emissions associated with fuel combustion for wastewater treatment. These emission reductions are achieved in the industrial fuel combustion sector, and do not overlap with reductions from electricity use (inside or outside the County) or fugitive emissions from wastewater (see below).

The following assumptions were used to calculate emission reductions attributed to this measure:

- In 2020, 36.7 percent of water supplied to the County will be processed as wastewater.
- This measure would result in a 7.3 percent reduction in water treatment and distribution (20 percent of 36.7 percent).
- The 7.3 percent is applied to the fuel combustion emissions associated with wastewater treatment.

This measure is estimated to result in a 0.03 percent reduction from total 2020 unmitigated industrial stationary source emissions which is a reduction of 1,109 metric tons of CO₂e.

Wastewater Treatment Processes

This measure would also reduce fugitive emissions associated with wastewater treatment processes due to a reduction in water use.

The following assumptions were used to calculate emission reductions attributed to this measure:

- In 2020, 36.7 percent of water supplied to the County will be processed as wastewater.

⁸⁷ California Energy Commission 2006.

- This measure would result in a 7.3 percent reduction in water treatment and distribution (20 percent of 36.7 percent).
- The 7.3 percent is applied to the fugitive methane emissions associated with wastewater treatment.

This measure is estimated to result in a reduction from 2020 unmitigated total emissions of 2,608 metric tons of CO₂e.

R3 Water Conservation Measures

The following measures could help to further conserve water and thus further reduce associated GHG emissions related to water conveyance and treatment.

R3WC1: Manage Storm Water Runoff

Implement low-impact development practices that maintain the existing hydrologic character of the site to manage storm water, reduce potential treatment, and protect local groundwater supplies.

While reducing stormwater runoff can help to indirectly reduce water treatment emissions, the amount of potential benefit has not been quantified at this time due to the inability to make predictions of exact amount of on-the-ground implementation that may occur by 2020.

R3WC2: Conservation Areas

Preserve existing land conservation areas for watershed protection to protect water quality (reduces water treatment energy use), and protect local water supplies (reduces imported water energy use). Protection of conservation areas can also provide carbon sequestration benefits, particularly in forested areas.

The exact benefits to carbon sequestration (compared to an unmitigated 2020 scenario) were not quantified due to the difficulty in predicting the specific location of conservation areas. Without knowing the areas of future conservation, the carbon sequestration benefits cannot be estimated.

R3WC3: Financing Mechanisms and Opportunities

There are currently multiple financing mechanisms and opportunities available to the County for implementing any of the above R2 measures or additional measures not evaluated in this analysis. Relevant mechanisms are described in the Implementation section of this report.

While financing is vital to implementing water conservation measures described above, it was not assumed that financing would result in a level of GHG reductions beyond that assumed in measure R2WC1.

Wastewater Treatment

This section provides information on calculations of GHG emission reductions related to R1 and R2 for wastewater treatment fugitive emissions for the County.

R1 Wastewater Treatment Measures

There are currently no R1 measures that were evaluated for Wastewater Treatment due to lack of State regulations in this sector.

R2/R3 Wastewater Treatment Measures

There are currently no R2 or R3 measures that were evaluated for Wastewater Treatment emissions because the County may have limited control over this sector. Emission reductions have not been quantified due to a lack of required modeling data, uncertainly associated with the County's jurisdictional control over a GHG source, or a lack of appropriate protocols required for quantification at the County level.

Natural Resource Conservation

As noted in the External Inventory, the loss of natural land covers, particularly forested or woodland areas, can result in loss of their carbon sequestration value.

R1 Natural Resource Conservation Measures

There are currently no R1 measures that were evaluated for Natural Resource Conservation due to lack of State regulations in this sector.

R2 Natural Resource Conservation Measures

There are currently no R2 measures that were evaluated for Natural Resource Conservation because the County may have limited control over this sector. Emission reductions have not been quantified due to a lack of required modeling data, uncertainly associated with the County's jurisdictional control over a GHG source, or a lack of appropriate protocols required for quantification at the County level.

R3 Natural Resource Conservation Measures

The following list of R3 measures includes additional measures that were considered reasonable, but were not relied upon to demonstrate achievement of the proposed County 2020 emissions target.

For each R3 measure below, it is unknown how much land and what types of tree species will be affected by 2020. The identity and quantity of additional vegetation to be planted in the County is not known. Because this information is unavailable, calculation of the carbon sequestering potential of this land-cover is not possible without more specific data. In addition, it is difficult to determine the effect of removing vegetation on the natural progression of sequestration rates for different land types. For these reasons, estimates of CO₂ release due to land clearing and the subsequent sequestration when portions of that land are replanted were not quantified without in-depth on-site evaluation.

R3NR1: Conservation Areas (Same as R3WC3)

Preserve existing land conservation areas (especially forested areas, oak woodlands, and wetlands) that provide carbon sink benefits.

Until specific areas of conservation are identified, the amount of potential GHG reductions (compared to an unmitigated scenario in which these areas would be otherwise developed) from this measure cannot be quantified.

R3NR2: Compensation for Loss of Sequestration

As part of Development Review, the County will consider requiring project-level compensation for loss of sequestration value through requirements for on-site and off-site tree planting and/or funding for restoration of forested areas, woodlands, and wetlands.

The amount of potential sequestration loss by 2020 has not been estimated to the difficulty in estimating which areas will actually be developed in the next ten years. Thus, the amount of compensation cannot be estimated at this time.

R3NR3: Urban Forestry

Evaluate the feasibility of substantially expanding tree planting in the County, including evaluation of potential carbon sequestration from different tree species, potential reductions of building energy from shading, and GHG emissions associated with pumping of water used for irrigation. Implement an urban forestry program if GHG emissions reductions exceed GHG emissions associated with implementation and water use.

Until the feasibility assessment is completed, the amount of potential GHG reductions from this measure cannot be quantified.

List of Preparers

This analysis was a collaborative effort of San Bernardino County, ICF International and PBS &J. The key personnel involved are noted below.

ICF International

Working with the County, ICF developed the Internal GHG emissions inventory, forecasting, and quantification of reduction measures presented in this appendix. The following ICF personal were involved in this analysis.

- Rich Walter, Project Director
- Rebecca Rosen, Technical Director
- Tony Held, Senior Reviewer
- Brian Schuster, Lead Technical Analyst
- Phil Groth, Building Energy Analyst
- Aaron Burdick, Building Energy Analyst
- Carrah Bullock, Technical Analyst
- John Durnan, Graphic Artist
- Ralph Torrie, Former Project Director

San Bernardino County

San Bernardino County staff provided direction on the overall program, input on current County programs, data for the GHG inventory, and worked with multiple County departments to develop and evaluate the GHG reduction program. The following County staff and consultants were the primary staff involved in this effort for the County:

- Christine Kelly, Director, Land Use Services Department
- Doug Feremenga, Project Manager
- Chris Warrick, Senior Planner
- Robin Cochran, Deputy County Counsel
- Staff from various County departments
- Randy Scott, Consultant to the County
- Michael Hendrix, Atkins, Consultant to the County
- Jim Squire, Former Assistant Director, Land Use Services Department
- Julie Rynerson-Rock, Former Land Use Services Director

▪ References

- Andreae, M. O., and P. Merlet. 2001. Emission of trace gases and aerosols from biomass burning. *Global Biogeochemical Cycles* 15(4):955–966.
- Augenstein, D. 1999. *Landfill operation for carbon sequestration and maximum methane emission control*. Final. (DE--AC26-98FT40422--01.) Palo Alto, CA. Prepared for: US Department of Energy.
- Australian Greenhouse Office. 2007. *Review of methane recovery and flaring from landfills*. Available: <<http://www.climatechange.gov.au/emissionstrading/publications/pubs/methanerecovery-paper.pdf>>. Accessed: April 14, 2009.
- California Air Resources Board (CARB). 2000. *Emission Factors for Open Burning of Agricultural Residues*. August.
- . 2002. *Appendix E: Urban Diesel Transit Bus Emissions Inventory*. Available: <<http://www.arb.ca.gov/regact/bus02/appe.pdf>>. Accessed: March 16, 2009.
- . 2007a. *Draft California Greenhouse Gas Inventory (millions of metric tons of CO₂ equivalent) — By IPCC Category*. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/rpt_Inventory_IPCC_Sum_2007-11-19.pdf>.
- . 2007b. *Expanded list of early action measures to reduce greenhouse gas emissions in California recommended for board consideration*. Available: <http://www.arb.ca.gov/cc/ceca/meetings/ea_final_report.pdf>. Accessed: December 12, 2008.
- . 2008a. *Climate change proposed scoping plan. Volume 2: analysis and documentation*. Available: <<http://www.arb.ca.gov/cc/scopingplan/document/appendix2.pdf>>. Accessed: December 12, 2008.
- . 2008b. *Climate change adopted scoping plan*. Available: <http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf>. Accessed: May 11, 2009.
- . 2008c. *Comparison of greenhouse gas emissions from natural gas and diesel vehicles*. Available: <http://www.arb.ca.gov/fuels/lcfs/100708ng_comparison.pdf>. Accessed: February 2, 2008.
- . 2009a. *Greenhouse Gas Inventory Data - 2020 Forecast*. Available: <<http://www.arb.ca.gov/cc/inventory/data/forecast.htm>>. Accessed: March 9, 2009.
- . 2009b. *Landfill Methane Control Measure*. Available: <<http://www.arb.ca.gov/cc/landfills/landfills.htm>>. Accessed: March 9, 2009.
- California Air Resources Board, California Climate Action Registry, ICLEI – Local Governments for Sustainability and The Climate Registry (CARB et al). 2008. Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories. Version 1.0 September 25, 2008. Available on the web at: http://www.arb.ca.gov/cc/protocols/localgov/pubs/final_lgo_protocol_2008-09-25.pdf
- California Climate Action Registry (CCAR). 2009a. *Annual Emissions Report: Southern California Edison*. Available: <<https://www.climateregistry.org/CarrotDocs/26/2006/SCEPUP06.xls>>.
- . 2009b. *General Reporting Protocol*. Available: <http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf>.
- California Employment Development Department. 2007. *Size of Business Data – 2001–present*. Available: <<http://www.labormarketinfo.edd.ca.gov/?pageid=138>>. Accessed: April 8, 2009.

- California Energy Commission (CEC). 2006. *Refining estimates of water-related energy use in California*. (CEC-500-2006-118). Available: <<http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>>. Accessed: February 5, 2009.
- . 2004a. Baseline Greenhouse Gas Emissions for Forest, Range, and Agricultural Lands in California. Final Report. 500-04-069F. March.
- . 2004b. *California Statewide Residential Appliance Saturation Study. Final Report, Executive Summary*. Available: <http://www.energy.ca.gov/reports/400-04-009/2004-08-17_400-04-009ES.PDF>. Accessed: April 15, 2009.
- California Integrated Waste Management Board (CIWMB). 1999. *Countywide Profile for San Bernardino County*. Available: <<http://www.ciwmb.ca.gov/Profiles/County/CoProfile1.asp?COID=36>>. Accessed: February 5, 2009.
- . 2007. *Construction and demolition debris recycling: local government sample documents*. Available: <<http://www.ciwmb.ca.gov/ConDemo/SampleDocs/>>. Accessed: February 11, 2009.
- . 2008a. *Single-year countywide destination detail*. Available: <<http://www.ciwmb.ca.gov/LGCentral/Reports/ReportViewer.aspx?ReportName=ExtEdrsSingleYrCountyWideDest&CountyID=36&ReportYear=2007/ConDemo/SampleDocs/>>. Accessed: February 11, 2009.
- . 2008b. *Technologies and management options for reducing greenhouse gas emissions from landfills*. Available: <<http://www.ciwmb.ca.gov/publications/Facilities/20008001.pdf>>. Accessed: April 27, 2009.
- . 2009. *Countywide Profile for San Bernardino County*. Available: <<http://www.ciwmb.ca.gov/Profiles/County/CoProfile1.asp?COID=36>>. Accessed: February 5, 2009.
- Commission for Environmental Cooperation. 2008. *Green Building in North America: Opportunities and Challenges*.
- Federal Highway Administration (FHWA). 1998. *Transportation and global climate change: a review and analysis of the literature*. Chapter 5: Strategies to reduce greenhouse gas emissions from transportation sources. Available: <http://www.fhwa.dot.gov/environment/glob_c5.pdf>. Accessed August 7, 2009.
- . 2008. *Integrating climate change into the transportation planning process*. Available: <<http://www.fhwa.dot.gov/hep/climatechange/climatechange.pdf>>. Accessed August 7, 2009.
- Greene, D. L. and A. Schafer. 2003. *Reducing greenhouse gas emissions from U.S. transportation*. Prepared for the Pew Center on Global Climate Change. Available: <http://www.cecpewclimate.org/files/PDF//GB_Report_ENdocUploads/ustransp.pdf>. Accessed: June 30 July 1, 2009.
- HDR Engineering, Inc. 2009. *Hayward Climate Action Plan*. Available: <<http://www.ci.hayward.ca.us/CAP08/pdfs/2009/1%20-%20Draft%20CAP%20-%20entire%20document.pdf>>. Accessed: March 16, 2009.
- Intergovernmental Panel on Climate Change (IPCC). 2006. *Chapter 5: Waste*. In: *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available: <<http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html>>.
- Forbes, S. and Dakin, R. No Date. Terrestrial Sequestration: An Adaptation and Mitigation Strategy, National Energy Technology Laboratory, <http://www.netl.doe.gov/publications/proceedings/03/carbon-seq/PDFs/054.pdf>

- Gaman, T. 2008. Oaks 2040: Carbon Resources in California Oak Woodlands. Prepared for the California Oak Foundation.
- Gaman, T. and Firman, J. 2008. Oaks 2040: The Status and Future of Oaks in California. Published by the California Oak Foundation.
- Kroodsma and Fields (2006), Carbon Sequestration in California Agriculture, 1980-2000, Ecological Applications: Vol. 16, No. 5, pp. 1975-1986
- National Council for Air and Stream Improvement (NCAIS). 2008. Carbon On Line Estimator 1605(b) report for San Bernardino County California. Available: <<http://ncasi.uml.edu/COLE/cole.html>>. Accessed: May 2009.
- San Bernardino Associated Governments (SANBAG). 2007. *Inland Goods Movement*. Available: <http://www.sanbag.ca.gov/planning/regional_goodsmt.html>. Accessed: April 8, 2009.
- San Bernardino County. 2006a. General Plan *Circulation and Infrastructure Background Report*.
- . 2006b. *Draft Program Environmental Impact Report for the San Bernardino County 2006 General Plan Program*. Appendix C: 2030 Growth Projections – Background Information. Prepared by Stanley R. Hoffman Associates. March 20.
- . 2008. Diesel Exhaust Ordinance. Available: <<http://www.sbcounty.gov/landuseservices/Staff%20Reports/2008/DieselOrd/DieselOrd.pdf>>. Accessed: April 21, 2009.
- . 2009. Assessor Parcel Data. San Bernardino County of the Assessor.
- Southern California Association of Governments (SCAG). 2008a. *2003 Model Validation and Summary: Regional Transportation Model*. Available: <<http://www.scag.ca.gov/modeling/>>. Accessed: March 9, 2009.
- . 2008b. *SCAG region: Compass Blueprint Case Study: downtown San Bernardino*. Available: <http://www.compassblueprint.org/files/htai_sbd.pdf>. Accessed: April 14, 2009.
- South Coast Air Quality Management District (SCAQMD). 2000a. *Rule 1192. Clean on-road transit buses*. Available: <<http://www.aqmd.gov/rules/reg/reg11/r1192.pdf>>. Accessed: December 11, 2008.
- . 2000b. *Rule 1195. Clean on-road school buses*. Available: <<http://www.aqmd.gov/rules/reg/reg11/r1195.pdf>>. Accessed: December 11, 2008.
- . 2009. *Greenhouse gas (GHG) inventories for the county of San Bernardino; technical document: methodology, assumptions, data sources and inventory*. Diamond Bar, CA.
- Spokas, K., J. Bogner, J.P. Chanton, M. Morcet, C. Aran, C. Graff, Y. Moreau-Le Golvan, and I. Hebe. 2006. Methane mass balance at three landfill sites: what is the efficiency of capture by gas collection systems? *Waste Management*. 26(5):Pp.516-525.
- Stanley Hoffman & Associates (Hoffman). 2009. *Revised General Plan Projections for the Unincorporated San Bernardino County*. Prepared for the County of San Bernardino. September 11.
- Stavins and Richards. 2005. The Cost of U.S. Forest-Based Carbon Sequestration, The Pew Center on Climate Change, Arlington, VA, http://www.pewclimate.org/global-warming-in-depth/all_reports/carbon_sequestration.
- U.S. Census Bureau. 2007 American Community Survey, table B25040. (LINK: http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=datasets2&_lang=en)

- United States Climate Change Science Program (USCCSP). 2007. *The First State of the Carbon Cycle Report (SOCCR): The North American Carbon Budget and Implications for the Global Carbon Cycle*. Synthesis and Assessment Product 2.2. November.
- U.S. Department of Energy. 2009. *The Economics of a Solar Hot Water Heater*. Available: <http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12860>. Accessed: April 2, 2009.
- U.S. Energy Information Administration (USEIA). 2003. *Commercial Buildings Energy Consumption Survey*. Available: <http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html#enduse03>. Accessed: February 15, 2009.
- . 2005. *Residential Energy Consumption Survey*. Available: <http://www.eia.doe.gov/emeu/recs/>
- U.S. Environmental Protection Agency (USEPA). 1998. *AP 42, Fifth Edition, Volume I, Chapter 2: Solid Waste Disposal; Section 2.4 Municipal Solid Waste Landfills*. Available: <<http://www.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf>>. Accessed: December 11, 2008.
- . 2007. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2005; Chapter 8: Waste*. (EPA 430-R-07-002.) April. Available: <http://epa.gov/climatechange/emissions/downloads/08_Waste.pdf>.
- . 2008a. *Inventory of U.S. greenhouse gas emissions and sinks: 1990–2006*. Available: <http://www.epa.gov/climatechange/emissions/downloads/08_CR.pdf>. Accessed: December 12, 2008.
- . 2008b. *Waste Reduction Model (WARM)*. Available: <http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html>. Accessed: February 5, 2009.
- . 2008c. *Landfill methane outreach program (LMOP); energy projects and candidate landfills*. Available: <<http://www.epa.gov/lmop/proj/index.htm>>. Accessed: February 11, 2009.
- . 2009a. *Lighting Products: ENERGY STAR*. Available: <http://www.energystar.gov/index.cfm?c=lighting.pr_lighting>. Accessed: April 6, 2009.
- . 2009b. *Landfill Methane Outreach Program (LMOP)*. Available: <<http://www.epa.gov/lmop/>>. Accessed: February 27, 2009.
- . 2009c. *Emissions & Generation Resource Integrated Database (eGRID)*. Version 1.1. Available: <<http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>>. Accessed: March 12, 2009.
- U.S. Geological Survey (USGS). 2009. *Cement Statistics and Information*. Available: <<http://minerals.usgs.gov/minerals/pubs/commodity/cement/>>. Accessed: July 28, 2009.

Personal Communications

- Maziar, S. Project Manager, Buildings and Appliance Office. California Energy Commission. December 2008—email correspondence with Aaron Burdick, ICF International.
- Bannerman, S. Office of Legal Affairs. California Air Resources Board. Sacramento, CA. September 1, 2009—email communication with Brian Schuster, ICF Jones & Stokes.

APPENDIX B

APPENDIX B - Internal Inventory/Reduction Plan Methodology

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ICF INTERNATIONAL

Introduction	B-1
Internal Inventory Emissions Calculation and Data Collection Methodology	B-4
Calculation Approach.....	B-4
2020 Unmitigated Emission Projections	B-5
Energy Use in County Facilities.....	B-5
County Vehicle Fleet.....	B-9
Solid Waste/Landfills	B-12
Employee Commute	B-15
Water Pumping and Water Treatment	B-17
Outdoor Lighting	B-18
Data Gap Analysis	B-19
Internal Inventory Results Summary	B-20
Internal Reduction Plan	B-24
Emissions Reduction Methodology	B-24
Introduction	B-24
Building/Energy Measures	B-26
Fleet/Fuels Measures	B-36
Solid Waste/Landfills	B-51
Employee Commute	B-62
Carbon Sequestration Measures	B-66
List of Preparers	B-68
ICF International	B-68
San Bernardino County	B-68
References	B-70
Printed references	B-70

Introduction

This section provides information and supporting material regarding the calculations of greenhouse gas (GHG) emissions for the San Bernardino County (County) Internal Inventory as well as data collection efforts for County emission sources included in the Internal Inventory.

The California Air Resources Board's (CARB) Local Government Protocol (LGOP) was followed in developing this Inventory and Reduction Plan. The Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (2006,) the U.S. Environmental Protection Agency (USEPA) Inventory (2007, 2008, 2009a, 2009b) protocols, and the California Climate Action Registry (CCAR) General Reporting Protocol (2009b) were also followed.

The Internal Inventory utilizes an “operational control approach,” as defined in the LGOP, to set the inventory’s organizational boundaries (CARB, 2008):

Operational Control Approach: A local government has operational control over an operation if the local government has the full authority to introduce and implement its operating policies at the operation. One or more of the following conditions establishes operational control:

- *Wholly owning an operation, facility, or source*
- *Having the full authority to introduce and implement operational and health, safety and environmental policies*

This approach is corroborated by the “operational control approach,” as defined in the World Resources Institute (WRI)/World Business Council on Sustainable Development (WBCSD) GHG Protocol (WRI/WBCSD 2004). In this context, the County’s Internal Inventory will include 100 percent of the GHG emissions from County activities over which it has operational control. This approach was selected because it most accurately accounts for GHG emissions from the County’s operations. **Table B-1** below summarizes the treatment in this inventory of the various facets of San Bernardino County’s internal organization.

Table B-1. County Organizational Boundaries

Business Activity	Included in Organizational Boundary?	Reason
Facilities—Owned	Yes	County exercises operational control over these premises, and, therefore, all facilities are included within the organizational boundary.
Facilities— Leased	Yes	
Vehicle Fleet	Yes	County exercises operational control over these fleets, and, therefore, all County fleets are included within the organizational boundary.
Outdoor Lighting	Yes	County exercises operational control over these operations, and, therefore, all operations are included within the organizational boundary.
Water Pumping and Water Treatment	Yes	County exercises operational control over these operations, and, therefore, all operations are included within the organizational boundary.
Solid Waste Management	Yes	County exercises operational control over these operations, and, therefore, all operations are included within the organizational boundary.

The Internal Inventory includes an analysis of the emissions for the County’s fiscal year ending June 30th 2007 (hereafter referred to as the “2007” inventory, or “Current” inventory, for the Internal Inventory) because it is the most recent year for which complete and accurate data could be obtained. The data in the Current year inventory is based on information gathered from the various County departments, the County General Plan, California Integrated Waste Management Board (CIWMB), and USEPA, as described below. The Internal Inventory also includes a 2020 inventory, an unmitigated projection based on current energy consumption and unit emission rates adjusted by sector specific growth rates [referred to as “2020 unmitigated”]. **Table B-2** presents the emissions sectors included in the Internal Inventory, the data source for each emission sector, and the methodology for projecting emissions to 2020.

Table B-2. Internal Inventory Data Sources and Methodology

Sector	Emission Sources	Source of Data	Projection Methodology Sources
County Facilities	Electricity consumption Natural gas consumption Other fuel consumption by type (natural gas, LPG, fuel oil, diesel, gasoline, etc.)	County electricity and natural gas records	County Detention Planning Report County Space Planning Report
Water Pumping and treatment	Electricity consumption Natural gas consumption	County electricity and natural gas records	County Detention Planning Report County Space Planning Report
Outdoor Lighting	Electricity consumption	County electricity records	County Public Works Department forecasts
County Fleet	On-road vehicles fuel combustion Off-road vehicles and equipment fuel combustion	County fleet records	County Fleet Management forecasts
Landfill Waste	Methane emissions from landfilled waste	County Solid Waste records	County Solid Waste Management forecasts
Employee Commute	On-road vehicles fuel combustion	County Commute survey	County Space Planning Report
Water Conveyance	Indirect electricity emissions for water supply and irrigation infrastructure	CEC	County General Plan growth forecasts

These emissions are separated by scope as follows. Scope 1, 2, and 3 emissions were quantified and included in the Internal Inventory.

Scope 1:

- Emissions from fuels consumed at all the County facilities (e.g. natural gas)
- Emissions from fuels consumed for water pumping and treatment (e.g. natural gas)
- Methane emissions from solid waste management
- Emissions from fuels consumed by all the County fleet vehicles

Scope 2:

- Emissions associated with purchased electricity used at all the County facilities
- Emissions associated with purchased electricity used for water pumping and treatment

Scope 3:

- Emissions from fuels consumed by County employee commute travel

Internal Inventory Emissions Calculation and Data Collection Methodology

Calculation Approach

During the County’s data collection process, ICF International compiled the appropriate emission factors for each of the sources identified for the Internal Inventory.

For electricity consumption, the Southern California Edison GHG emission factor was applied to determine GHG emissions for all of San Bernardino County’s locations as this factor was the most specific factor publicly available. All other emissions were calculated based on global emission factors provided in the 2008 LGOP (CARB 2008).

As different units are often provided for energy consumption (i.e., therms, MBtus, m³, ft³), data for all energy was converted to a single metric (Terajoules) before calculating metric tons carbon dioxide equivalent (MTCO₂e) using the above-mentioned emission factors.

Emission Factors used in the analysis and appropriate references are summarized in **Table B-3** below.

Table B-3. GHG Emission Factors

Fuel	Emission Factor	Source
Compressed Natural Gas (CNG) (Vehicle)	0.054 Kg CO ₂ /Standard Ft ³	USEPA Inventory of Greenhouse Gas Emissions and Sinks 1990–2006 (2008a)
Motor Gasoline (Vehicle)	8.81 Kg CO ₂ /U.S. gal	Provided in the California Local Government Operations Protocol (CARB et al. 2008)
Propane (Vehicle)	5.74 Kg CO ₂ /U.S. gal	
Diesel (Vehicle)	10.15 Kg CO ₂ /U.S. gal	
Natural Gas	0.0546 Kg CO ₂ / Standard Ft ³	
	0.1 g NO ₂ /MMBTU	
	5 g CH ₄ /MMBTU	
Electricity	290.87 kg CO ₂ /MWh	CCAR (2009a) Public Reports and USEPA eGrid2007 (2005 data) (2009)
	2.04 kg NO ₂ /GWh	
	13.88 kg CH ₄ /GWh	

The global warming potentials (GWPs) of the GHGs for a 100-year timeframe are used to express the total GHG emissions on a CO₂-equivalent (CO₂e) basis¹. The concept of GWP is used to compare different GHGs to each other by expressing them on the same basis, in this case in terms of CO₂-equivalence.

¹ The GWPs of CO₂, CH₄, and N₂O are 1, 21, and 310, respectively.

2020 Unmitigated Emission Projections

The 2020 unmitigated projection is used in the GHG Reduction Plan to aid in target setting and future monitoring of emission reductions. The 2020 unmitigated projections are developed based on current energy consumption and growth rates provided by various County reports and County employees. Specific assumptions associated with growth rates are provided in Table B-4.

Table B-4. 2020 Unmitigated Internal GHG Emissions Projection Assumptions

Emission Source	Percent Annual Increase	Assumption Source
Detention facilities	4.0	County Detention Planning Report
All other facilities	2.0	County Space Planning Report
Sheriff's Vehicle fleet	2.0	County Sheriff's Department
All other Vehicle fleet	1.0	County Fleet Management Dept.
Streetlights	1.0	County Public Works Dept.
Landfill Waste	1.1	County Waste Management Dept.
Water Pumping and Treatment	4.6	Unincorporated County Population Growth
Employee Commute	2.0	County Space Planning Report

Overall, County emissions projections increase over time under the unmitigated scenario due to the anticipated growth in population resulting in greater requirements from County operations and subsequent energy consumption. The projections developed for the energy-related emissions from County facilities and fleets (Table B-4 above) provide a pragmatic outlook to the unmitigated scenario.

The employee commute was projected to increase at a level of two percent annually based on expected growth described in the 2004 County Final Master Space Plan.

The landfill emission projections were developed under the assumption of an annual waste-to-landfill increase of 1.1 percent, as provided by County Solid Waste Management Department. In addition, the County's Solid Waste Management Division expects that the quantity of waste sent to landfills with methane recovery systems in place is expected to rise such that, by 2020, 90 percent of new waste would be sent to landfills with a methane recovery system. As such, waste emissions will not necessarily increase linearly with the growth in new waste, but will also depend upon the landfill controls.

Energy Use in County Facilities

Energy use in County-owned and leased buildings is the second largest component of the County's Internal Inventory, accounting for approximately 19 and 16 percent of the Internal Inventory in 2007 and 2020 respectively (see Tables B-13 and B-14).

Unmitigated 2020 emissions were projected using a four percent annual growth rate for the electricity and natural gas consumption from detention facilities and two percent annual growth rate for all other facilities.²

Data Collection

The primary sources of GHG emissions from buildings are the electricity consumed and the natural gas combusted onsite. Obtaining data on the County's electricity and natural gas consumption (as well as costs) was the primary target for the data collection efforts. In addition, the following County data was also obtained whenever possible:

- Building area (square footage)
- Approximate age of building / year of construction
- Number of occupants
- Number of floors
- Number of indoor parking spaces
- Annual hours of operation
- Retrofit history
- Facility condition index
- Anticipated disposal or demolition before 2020
- Any other information that might impact current or future energy usage

County Facilities Management Department

Building energy use data was included in a cost spreadsheet provided by the County's Facilities Management Department. In addition to cost data for approximately 188 County utility accounts, the cost spreadsheet also contains electricity (in kWh) and natural gas (in therms) consumption data for those accounts. A total of 188 accounts were included in this data set covering all County owned or leased buildings under Facility Management control.

Data was collected from the Computer Aided Facilities Management (CAFM) database, which contains information regarding all buildings owned or leased by the County. The CAFM output includes building addresses, square footage, functional description, and functional use codes.

County Special Districts Department

County Special Districts Department provided information, including electricity consumption and natural gas consumption and cost data, for all County Board of Supervisors-governed Special District facilities as well as supplemental information for a limited number of those facilities. A total of 86 facilities were included in this data set.

County Fire Stations

Utility data for County fire stations was obtained from the County Fire Department and the County's Chief Administrative Office. Bear Valley Electric, Southern California Edison

² County of San Bernardino 2004, Final Master Space Plan.

(SCE), and the City of Needles Utility Services provided electricity use data. No natural gas usage data was available. A total of 65 facilities were included in this data set. Data was available for 58 of these facilities.

County Libraries

Information provided from the County Libraries included electricity and natural gas consumption and cost data for 21 facilities.

Arrowhead Regional Medical Center

Information provided by the Arrowhead Regional Medical Center (ARMC) included electricity and natural gas consumption for the ARMC.

Leased Buildings

The County has 239 leased buildings, the majority of which are “full-service” leases (i.e., the landlord pays the utility bills). Due to the difficulty in obtaining historical energy use data from the County’s 190 landlords, energy use associated with these leased buildings was estimated using the Commercial Buildings Energy Consumption Survey’s (CBECS) electricity and natural gas energy intensity for office space based on leased building size (square footage) as a benchmark.

Emissions Calculations

It is important to note the distinction between direct and indirect emissions. Direct emissions are those that are produced at the source of consumption, while indirect emissions are those produced somewhere other than the point of consumption. Electricity consumption produces GHG emissions indirectly (at a generator’s facility), whereas fuels used for heating and hot water produce GHG emissions at the point of consumption. To calculate GHG emissions, state-specific emission factors for electricity use and global emission factors for fuel use (natural gas) were applied to site-specific utility consumption data provided by San Bernardino County and applied to calculate carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions.

Electricity is generated using coal, natural gas, oil, nuclear, hydro, and other renewable energy such as wind and solar photovoltaics. Each of these sources contributes a different amount of GHGs per kWh of electricity produced, with coal creating the most GHG (per kWh) and (most) renewables and nuclear emitting almost no GHG. The extent to which each one of these sources contribute power to a specific grid determines the average emission factor for electricity delivered to customers within that grid.

The general formulae are:

$$MTCO_{2e} = kWh \text{ per year} * MTCO_{2e}/kWh$$

$$MTCO_{2e} = standard \text{ ft}^3 \text{ natural gas per year} * MTCO_{2e}/ standard \text{ ft}^3 \text{ natural gas}$$

County facilities are characterized exclusively within this inventory by the emissions associated with electricity and natural gas. Other County operations characterized by their electricity consumption include water pumping and sanitation facilities as well as outdoor park lighting. Energy consumption could not be further disaggregated beyond the facility level for all County operations due to data limitations. In addition, for facilities that

perform water pumping and water sanitation, it was assumed that all of the energy consumption at these facilities consists of these energy intensive processes.

Emissions for County facilities and County-operated outdoor lighting (including park lighting, traffic lights, and flashers as well as streetlight operations) were calculated with the equation listed above.

These energy-use related emissions are presented in **Table B-5** and **Figure B-1**. The primary sources of GHG emissions from buildings are the electricity consumed and the natural gas combusted on site.

Table B-5. Internal Energy Use–Related GHG Emissions for 2007 and 2020 unmitigated

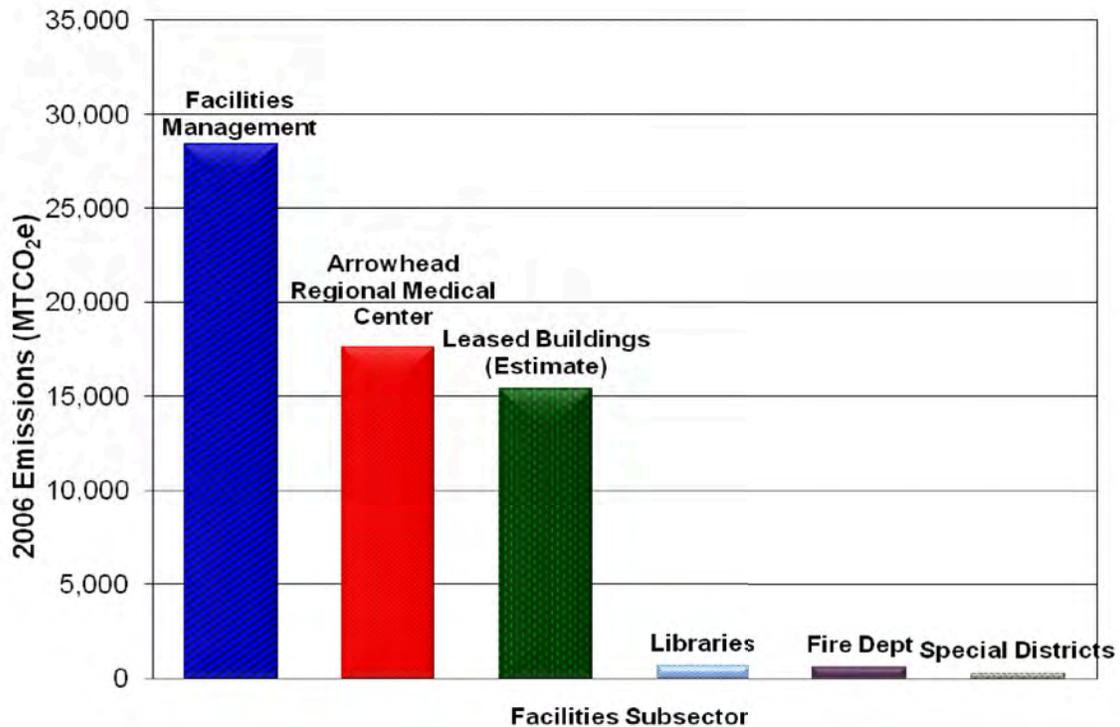
Data Source	2007 Emissions (MTCO₂e)	2020 Unmitigated Emissions (MTCO₂e)
Facilities Management	28,391	50,325
ARMC ¹	17,639	17,639
Leased Buildings ²	15,418	15,418
Libraries	667	667
Fire Department	589	589
Special Districts Department	277	277
Total	62,981	84,915

¹ Arrowhead Regional Medical Center

² Estimated based on Commercial Building Energy Consumption Survey average electricity and natural gas energy intensity for office space, using building size as a benchmark

Electricity and natural gas use data was collected for the County’s facilities, leased buildings, libraries, special districts, fire stations, and Arrowhead Regional Medical Center (ARMC). County Facilities Management Department (which oversees detention facilities, airport facilities, courthouses, sheriff facilities, and County government complexes) is responsible for the management of most County facilities and is, therefore, the largest emissions contributor (i.e., 45 percent in 2007 and 59 percent in 2020 unmitigated). Emissions associated with the Arrowhead Medical Center are the largest for a single facility in 2007 and 2020 unmitigated.

Figure B-1. Internal Energy Use–Related 2007 GHG Emissions



County Vehicle Fleet

Transportation activities account for one-third of U.S. CO₂ emissions or 1,861 MMTCO_{2e}.³ Greenhouse gas emissions from the vehicle fleet represent the third largest component of the County’s internal total emissions.

Fuel combustion for on- and off-road vehicles and equipment in the County Vehicle Fleet resulted in 34,957 MTCO_{2e} in 2007 and 42,526 MTCO_{2e} in 2020, accounting for approximately ten (10) and eight (8) percent of the internal inventory for 2007 and 2020 unmitigated, respectively.

Data Collection

The primary source of GHG emissions from vehicles is the combustion of fuels such as gasoline and diesel. Obtaining data on fuel consumption and cost was the primary target for the data collection efforts. In addition, the following data was obtained whenever possible:

- Vehicle type, class, size information
- Expected retirement or disposal year, if known
- Vehicle model year

³ US EPA, 2008a.

-
- Fuel type for each vehicle (gasoline/diesel/propane/natural gas)
 - Total vehicle miles traveled (VMT) in base year
 - Annual capital expenditure schedule for vehicle fleet
 - Off-road equipment and fuel consumption
 - Programs for fuel switching, fleet downsizing, etc.
 - Projection data on the size and composition of the County vehicle fleet in 2020
 - Any other information that might impact current or future fuel usage

County Fleet Management Department

Data obtained from the County Fleet Management Department on the motor pool and non-motor pool vehicles includes vehicle composition, as well as the number of low emission vehicles (LEV) or ultra low emission vehicles (ULEV) in the fleet; percent breakdown by vehicle type, age, cost; projected disposal date; total annual fleet VMT; average annual and monthly miles per vehicle; capital expenditure; cost of fuel (total, per vehicle, per mile, and per gallon); fuel switching; fleet size projection; and fuel type and consumption.

County Fire Department

The County Fire Department (County Fire) provided a list of vehicles by type, purchase price, fuel type, and estimated retirement year. County Fire has not tracked fuel use in the past and is just now starting a manual tracking system. County Fire provided fuel consumption data for diesel, unleaded, unleaded plus, supreme, and propane for multiple department accounts.

County Public Works Department / Flood Control District

Vehicle fleet information was obtained for the Flood Control District portion of the County's Public Works Department, included a list of vehicles by type, model year, fuel consumption, and annual costs (such as operating, maintenance, repair, and fuel costs). Information on all County Public Works Department off-road vehicles and equipment, including generators, was also obtained. Additional information received includes total consumption for compressed natural gas (CNG), diesel, and unleaded gasoline fuels.

County Sheriff's Department

The County Sheriff's Department provided county fuel pump cost and consumption data; a catalogue of the sheriff's fleet by year, make, model, type and fuel; total fuel consumption and cost (for diesel and gasoline); information regarding Flex-Fuel vehicles; engine downsizing; and fleet growth.

Emissions Calculations

Emissions from fleet vehicles result from the combustion of fuel. San Bernardino County provided fuel consumption data for its various fleets in order to calculate associated Scope 1 emissions. The general formula to calculate emissions from vehicles is:

$$MTCO_{2e} = \text{Volume of fuel consumed} * MTCO_{2e}/\text{volume}$$

Table B-6 summarizes the 2007 fleet profile of County-owned vehicles in five (5) general departments: fire, fleet motor pool, fleet non-motor pool, sheriff, and public works/flood

control. The vehicle types include heavy duty, passenger/light duty (sedans, vans, motorcycles, and light-duty trucks), medium-duty trucks, and other (construction equipment, marine vehicles, and other). As shown here, the majority of the fleet is comprised of sedans, light-duty trucks, and vans. The largest fleets are the County and Sheriff's motor pools. Table B-6 also includes waste haulers; the waste hauler fleet is composed of multiple subcontracted fleets. All waste hauler fleet calculations are based on available data, which is not inclusive of all subcontractors. The vehicle mix for the contracted waste hauler fleet was not available.

Table B-6. County Vehicle Fleet Profile for 2007

Vehicle Type	County Fire	Fleet Department: Motor Pool	Fleet Department: Non-Motor Pool	Sheriff's Department	Flood Control District	Waste Haulers ¹	Total
<i>Passenger/Light Duty</i>							
Light-duty trucks	200	593	104	300	103	–	1,300
Sedans	51	747	43	637	1	–	1,479
Vans	1	341	58	114	6	–	520
Motorcycles	–	–	–	85	–	–	85
<i>Medium/Heavy Duty</i>							
Medium Duty	37	7	20	20	–	–	84
Heavy Duty	172	–	19	35	40	53	319
<i>Other</i>							
Construction	11	–	3	14	52	–	80
Marine	5	–	–	17	1	–	23
Other	175	–	3	55	21	–	254
Total	652	1,688	250	1,277	224	53	4,144

Table B-7 presents the total GHG emissions from each vehicle type for 2007 and 2020 (unmitigated). Vehicle fleet GHG emissions are listed by general vehicle class. GHG emissions were estimated based on fuel consumption of vehicles within each class for all fleets. Fuel consumption by vehicle type was not available for either the Fire or Sheriff's department, so total GHG emissions for these fleets were apportioned based on the percent composition of each vehicle type in each fleet. For example, passenger/light-duty vehicles comprise approximately 39 percent of the County Fire vehicle fleet, so 39 percent of County Fire GHG emissions were assigned to passenger/light vehicles for that fleet.

Table B-7. Emissions for 2007 and Projected for 2020 Unmitigated by Vehicle Type

Vehicle Type	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e) ¹	Percentage of Fleet Emissions
Passenger/light-duty ²	24,997	30,818	73
Medium-duty ³	689	828	2
Heavy-duty ⁴	1,883	2,229	5
Waste Haulers ⁴	4,964	5,706	13
Other ⁵	2,425	2,945	7
Total	34,957	42,526	100

¹ 2020 unmitigated emissions were projected using a two (2) percent growth for the Sheriff fleet and one (1) percent for all other fleets

² Gross weight 0–8,500 lbs (sedans, pick-up trucks, SUVs, and vans).

³ Gross weight 8,500–14,000 lbs (large pickups and SUVs [Ford F450, F550, Dodge Ram 2500, etc.]).

⁴ Gross weight 14,000+ lbs (fire trucks, dump trucks, semi-trucks, water trucks, flatbed trucks, etc). Waste haulers are heavy-duty vehicles.

⁵ Includes construction equipment, marine vehicles, stationary engines, and off-road equipment.

Solid Waste/Landfills

The landfills owned and operated by the County contain waste that has been generated by the entire County population over a long historical period; the oldest landfill site opened in 1949. Landfill emissions differ from County energy use and fleet emissions since the waste in the landfills was primarily generated by County residents and not by County employees or direct County operations. Due to the County's waste management authority, the County is responsible for emissions related to landfill waste it did not create. As such, landfill emissions are the dominant GHG emission type in the County Internal Inventory for 2007, accounting for approximately 61 percent of the emissions. Because County-wide waste is managed under County operations, there is significant potential for reducing these emissions through landfill gas recovery and related electricity generation.

Landfill emissions from landfills owned and operated by the County account for approximately 61 and 66 percent of the Internal Inventory in 2007 and 2020 unmitigated. These emissions are a subset of the Landfill Emissions reported in the External Inventory, which includes all landfills in the unincorporated area. The County operates six (6) active landfills and maintains 15 closed landfill sites; the County's Solid Waste Management Department (SWMD) is responsible for the management of all 21 landfills. Emissions for each landfill in the Internal Inventory are slightly different than emissions presented in the External Inventory because the emissions presented below are for the FY 06/07, not calendar year 2007. Landfill data was provided by the County SWMD, the USEPA, and the California Integrated Waste Management Board (CIWMB).

Data Collection

Solid Waste Management Division

The primary source of GHG emissions from landfills is direct methane emissions from waste decomposition. Obtaining data on landfill size was the primary target for the data collection efforts. In addition, the following data was obtained whenever possible:

- Landfill details
 - Open and close dates
 - Capacity
 - Current and projected volume and composition of waste received
 - Tipping fees
 - Estimated accumulated waste-in-place
- Methane Recovery system details
 - Quantity recovered
 - Energy recovery system present
 - Revenue generated
- Information related to recycling and composting programs
- San Bernardino County Internal Waste Generation
 - Volume and composition
 - Treatment and storage options
 - Disposal fees
 - Current and proposed waste reduction programs

The County provided three key measurements for all County-operated solid waste management facilities: total tonnage, annual projected estimates, and methane recovery measures. Additional Waste data is available publicly through the CIWMB website, which provides waste-in-place tonnage for all active landfills, total available capacity, and waste composition details. The County also provided waste-in-place data for closed landfills under County control. Landfill age and closure dates, waste-in-place estimates, and methane recovery information was used to calculate methane emissions from landfills owned by the County.

County Facilities Internal Waste

The organic waste produced by County operations contributes to methane emissions at County owned and operated landfills. This source of emissions is much smaller, however, than the methane generated from the cumulative waste-in-place at those landfills, the majority of which results from waste deposited by the community. The County does not currently track internal waste production. The County contracts with various companies who have individual pick-up costs, a diverse range of bin sizes, and an unknown mix of waste compositions. It is also unknown how full bins are at scheduled pick-up times.

Because data was unavailable and the total expected emissions were determined to be inconsequential to internal County operations, the County's internal production of waste is not specifically included in the Internal Inventory, though the emissions from this waste are accounted for in the total emissions associated with County owned and operated landfills.

Emissions Calculations

The 2020 unmitigated GHG emissions were projected through a first-order kinetics method based on:

- current waste in landfills from prior years (i.e., waste-in-place), and
- projected new waste generated between 2007 and 2020.

Total County landfill methane emissions are 206,817 MTCO₂e in 2007 and 342,479 MTCO₂e in 2020, accounting for approximately 61 and 66 percent of the internal inventory in the respective years. **Table B-8** presents landfill emissions for 2007 and 2020 unmitigated.

Table B-8. Internal Solid Waste Emissions for 2007 and 2020 Unmitigated

Landfill Site	Landfill Status	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)
County-Owned Landfills			
Victorville	Active	19,853	17,730
Barstow	Active	18,265	14,626
Colton	Active	26,393	21,619
Mid-Valley	Active	44,358	39,563
Landers	Active	13,494	11,294
San Timoteo	Active	22,145	18,480
Apple Valley	Closed	3,619	2,735
Baker	Closed	63	47
Big Bear	Closed	4,581	3,462
Hesperia	Closed	5,386	4,071
Lenwood-Hinkley	Closed	937	708
Milliken	Closed	31,999	24,184
Morongo Valley	Closed	817	617
Phelan	Closed	2,604	1,968
Trono-Argus	Closed	468	354
Twenty-Nine Palms	Closed	2,676	2,022
Yermo	Closed	236	178
Lucerne Valley	Closed	687	519
Needles	Closed	1,506	1,138
Newberry	Closed	557	421
Yucaipa	Closed	6,173	4,666
New Waste to landfill with methane recovery	NA	NA	119,131
New Waste to landfill without methane recovery	NA	NA	52,947
Total		206,817	342,480

Employee Commute

There are over 17,000 County employees. The average employee commute distance is approximately 17 miles per trip. **Figure B-2** below shows San Bernardino County one-way employee commute distances, including the number of employees commuting at each distance based on the 2008 employee survey report. As shown, a significant fraction of employees commute more than 20 miles one way. Specifically, the 50 percent VMT point is approximately a one-way reported distance of 25 miles (**Figure B-3**). The data in these figures highlight the potential to achieve GHG emission reductions through additional employee commute measures targeted specifically at employees with these large commute distances.

Data Collection

The County provided the employee commute annual plan, which is developed based on a requirement by South Coast Air Quality Management District (SCAQMD). This annual commuter report is compiled and submitted to the SCAQMD by the County's Human Resources Department. County Human Resources provided the annual report for 2007, training material, and individual employee commute distances for 2008.

SCAQMD requires that all County-operated facilities with greater than 250 employees implement an employee commute program; this program is then monitored through an annual survey and report. In 2007 San Bernardino County operated eight (8) sites with greater than 250 employees (regulated sites). Combined, the eight sites represent 9,267 employees. The 2007 annual survey was used to provide site-specific disaggregated transportation modes and number of trips. The annual report did not include trip distance; trip distance was estimated based on the raw data collected for the 2008 survey (2007 data was not available). The average distance traveled by mode was applied across all sites. An estimate of total employment in 2007 was provided by Human Resources, and average fuel consumption by type for regulated sites was used to develop a fuel consumption estimate for non-regulated County employees.

Emissions Calculations

Total number of trips by mode was determined across all modes of transportation based on the employee commute survey for all regulated sites. The general average distance traveled by mode was applied across all sites. The average fuel consumption by type for regulated sites was used to develop a fuel consumption estimate for non-regulated County employees.

The general formula is:

*Transportation emissions (by vehicle type) (tonnes CO_{2e}) = Average distance traveled to and from office by mode * number of working days in a year * t CO_{2e} / mile*

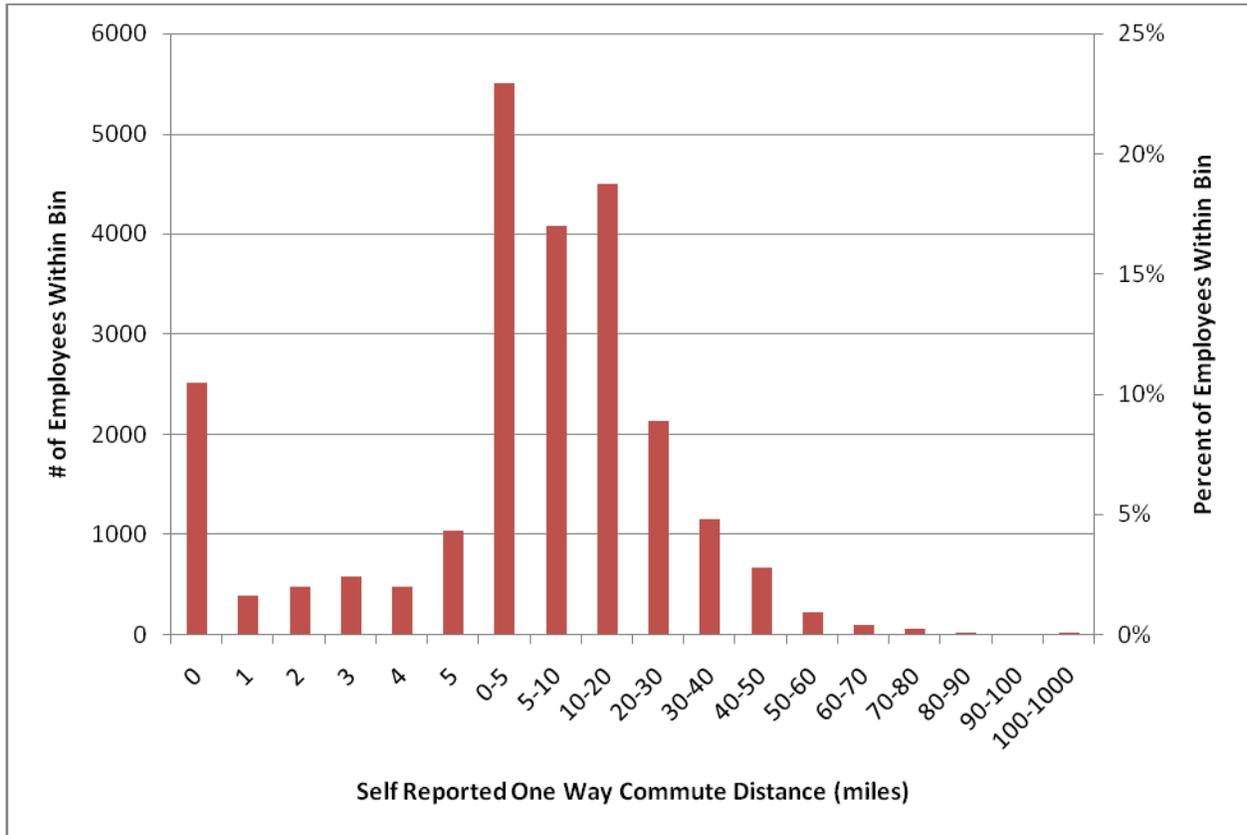
Fuel combustion for on-road vehicles due to employee commutes is the fourth largest component of the Internal Inventory accounting for 32,000 MTCO_{2e} and 43,000 MTCO_{2e} for year 2007 and 2020 unmitigated GHG emissions, respectively. These GHG emissions represent ten (10) percent and eight (8) percent of the County's GHG emission inventory for the year 2007 and 2020 unmitigated, respectively. These emissions are presented in **Table B-9**. Employee commute emissions are based on data in the County's annual 2008 employee survey report.

Table B-9. Internal GHG Emissions for Employee Commutes for 2007 and 2020 Unmitigated

Sector	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO) ¹
Employee Commute	32,490	42,869

The total employee VMT was projected to increase at a level of two (2) percent annually based on expected growth described in the 2004 County Final Master Space Plan⁴.

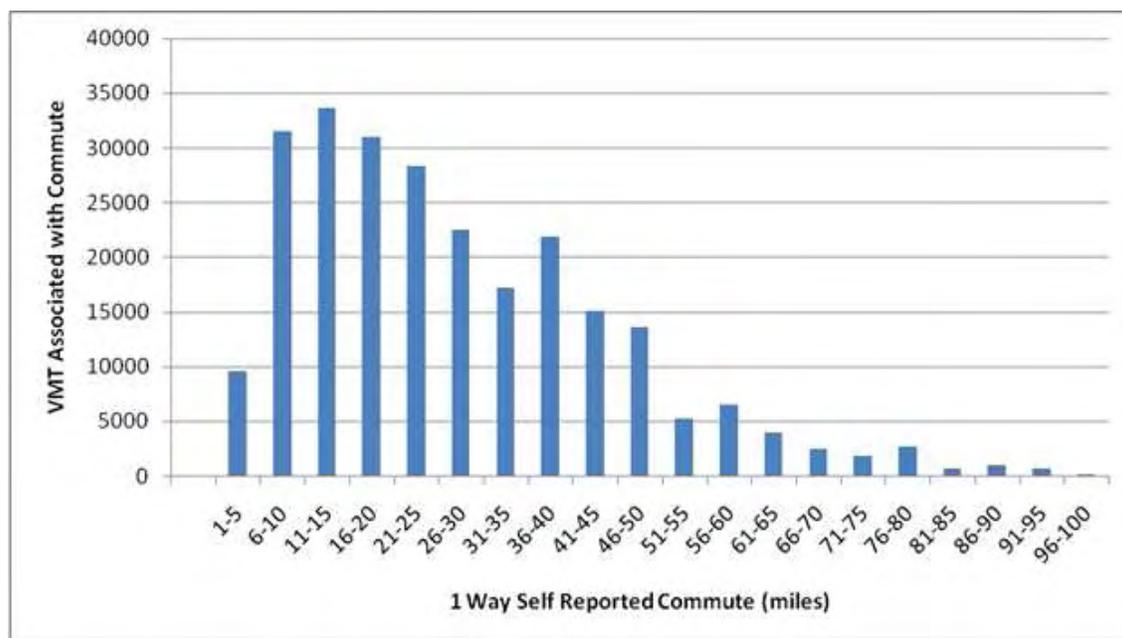
Figure B-2. San Bernardino County One-Way Employee Commute Distances (2008)



Based on 2008 Annual Employee Commute Survey

⁴ Recent growth forecasts provided by the County indicate that these projections may have changed (Stanley R. Hoffman Associates, 2009, Revised General Plan projections for the Unincorporated San Bernardino County) These projections were not updated, however, because specific information regarding the County operations and employee employment for future years was not provided.

Figure B-3. VMT Associated with One-Way Employee Commute Distances



Based on 2008 Annual Employee Commute Survey

Water Pumping and Water Treatment

Water pumping and water treatment are electricity-intensive operations and can contribute significantly to a municipal GHG inventory. County contracts out a large portion of the water pumping and treatment required by the County. Consequently, the associated emissions are not included in the internal component of the County inventory.

Data Collection

County-operated water treatment and sewage facilities are managed by County Special Districts Department, which provided total fuel consumption for all County Special Districts facilities. It was assumed that all electricity and fuel consumption for water pumping facilities were attributed to the actual water pumping process. Although there may be other small energy requirements within these facilities, it was determined that the energy requirements are completely dominated by water pumping. Consequently, all energy consumption at these facilities is assumed to be attributed to water pumping and treatment requirements.

Energy consumption for water pumping and treatment accounts for approximately one (1) percent of the Internal Inventory in 2007 and 2020. Water pumping and water treatment are electricity-intensive operations and can contribute significantly to a GHG inventory. San Bernardino County contracts out a large portion of the water pumping and treatment required by the County, and therefore the associated emissions are not included in the internal component of the County inventory. Electricity consumption for water pumping and water treatment was provided by the County.

GHG emissions from water pumping and water treatment are presented in **Table B-10**.

Table B-10. Internal GHG Emissions for Water Pumping/Treatment for 2007 and 2020 Unmitigated

Sector	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)
Water Pumping and Treatment	2,192	4,114

Outdoor Lighting

Energy consumption for outdoor lighting (streets and traffic lights only) is the smallest component of the Internal Inventory accounting for approximately 0.1 percent of the 2007 and 2020 unmitigated inventories. The County is responsible for street and traffic lighting only within the County land-use authority (LUA) area; most outdoor lighting found within the greater County boundaries is managed outside of these LUA areas (within the incorporated cities). Therefore, though presented below, outdoor lighting energy consumption does not comprise a large proportion of the overall County internal inventory. Electricity consumption data for outdoor lighting was provided by the County.

GHG emissions from outdoor lighting are presented in **Table B-11**.

Table B-11. Internal GHG Emissions for Outdoor Lighting for 2007 and 2020 Unmitigated

Sector	2007 Emissions (MTCO ₂ e)	2020 Unmitigated Emissions (MTCO ₂ e)
Outdoor Lighting (flashers, park lighting, traffic and street lights)	276	317

Data Collection

Traffic Lights and Flashers

Total electricity expenses from traffic lighting were provided by the County Public Works Department. However, because traffic lights are invoiced individually, obtaining a full set of invoices was determined to be overly cumbersome, and an annual estimate was provided instead, based on one (1) month's energy consumption⁵. The County Public Works Department also provided traffic light equipment details and retrofit data.

Street Lighting

The majority of street lighting in the County is managed by the incorporated cities. Total Electricity consumption from street lighting under County control was provided by County Special Districts Department. The annual sum of energy consumption from street lighting was included with the building energy data provided by County Special Districts Department.

Park Lighting

Park lighting is the third source of outdoor lighting identified by the County. County-operated parks are managed within two departments, Special Districts and Regional Parks.

⁵ Annual energy consumption is not expected to vary significantly over time; most lights maintained by the cities are traffic lights which have consistent schedules.

Outdoor lighting energy consumption was included with the energy consumption for facilities located within the parks.

Data Gap Analysis

Data gaps are expected in initial GHG Inventories; an integral component of an initial inventory is the identification of these gaps in order to develop more robust inventories in the future. Although the internal inventory is comprehensive, subsequent versions of the inventory may address the data gaps presented below.

CAFM Database

Building area data was provided through the CAFM database. Energy consumed per square foot or “energy intensity” is a key metric used to understand energy consumption trends. Unfortunately, in CAFM individual facilities are sometimes monitored through multiple building codes, or multiple buildings are serviced by an individual meter. As the meters cannot consistently be mapped directly to one (1) building, it is difficult to analyze energy intensity. Having been released in July 2008, the CAFM database is still in the early stages of development. Some data fields (e.g. *parking spaces*, *employee headcount*, and *number of floors*) are not yet consistently populated, and additional features, such as the ability to access 3D architectural diagrams through the database, are still under development.

A more accurate analysis for building energy intensity can be made by incorporating CAFM into all County departments and by integrating energy consumption data within CAFM itself. Integrating electricity consumption into CAFM would ensure that each meter could be traced to a specific CAFM ID, thereby eliminating the current hurdle of synching multiple databases together using imperfect correlation techniques caused by the meter/building code discrepancies described above. By facilitating benchmarking of energy intensity, the County will be better able to track the progress of energy efficiency improvements to County buildings.

Recommendation

Energy consumption data should be integrated into the CAFM database in order to more accurately track the energy intensity of County facilities. This will require greater coordination on the development of the CAFM database between County departments and facility managers. The database should be accessible to all facility managers who track energy consumption with the appropriate quality assurance and quality control measures to ensure data accuracy.

Emissions from Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are typically used as refrigerants in air-conditioning and refrigeration systems. HFCs tend to have very high global warming potentials; therefore, small amounts of HFCs leaked to the atmosphere result in significant contributions in terms of MTCO₂e. No data was provided by County for HFC releases as there was no process in place to capture such data in 2007.

Recommendation

A pilot study could be undertaken to look closely at refrigerant replacement in the oldest and largest chiller/heating, ventilation, and air conditioning (HVAC) equipment. This

detailed study would evaluate the refrigerants used against all the reportable types and determine if emissions from refrigerant leakage were *de minimus*.

Emissions from Facility Waste

Facility waste (Municipal Solid Waste or MSW) is taken to landfills, where anaerobic decomposition processes emit methane. There was no waste data available that could allow for extrapolation to all County facilities.

Recommendation

Emissions from facility waste should be included as part of the overall facility-based GHG inventory. Data required are the amounts of waste generated per year from each facility, including a characterization of the waste stream profile (percentage paper, organics, plastics, metals, and so on). Waste audits could be performed on a sample of facilities, and data could then be extrapolated to determine an estimate for waste at all facilities. In addition to waste generation data, the County should also track and report volume of material recycled.

Process and Fugitive Emissions from Wastewater Treatment

Information on process and fugitive emissions related to water treatment facilities was unavailable and could therefore not be included within the inventory. As the County contracts out most water treatment it was assumed that these emissions would be *de minimus* in comparison to the overall inventory.

Recommendation

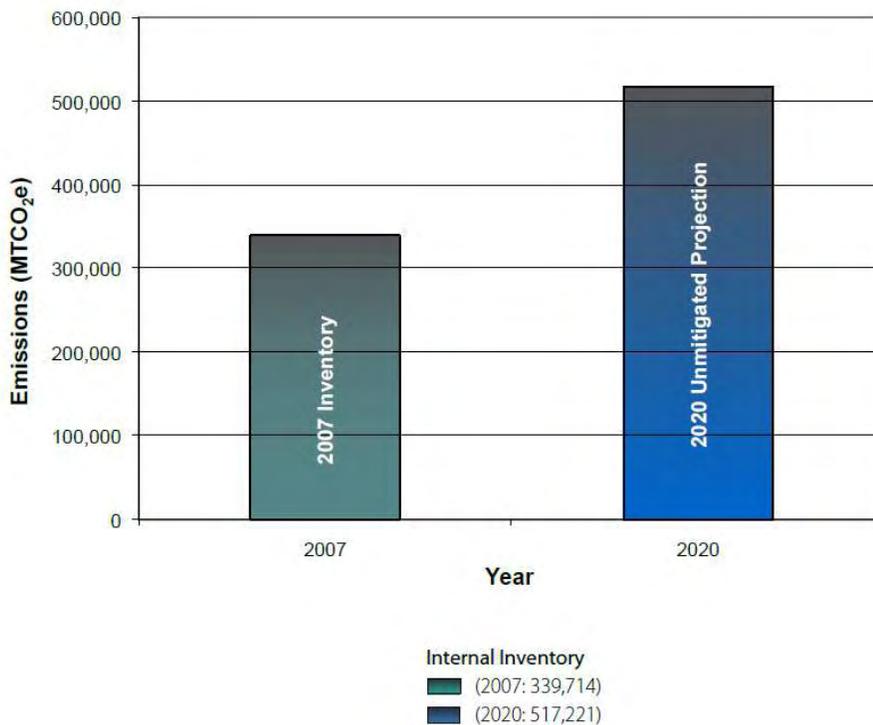
It is possible to estimate these emissions based on population served and general technology in place. Estimates can be determined based on the methodology provided in the Local Government Operations Protocol (LGOP).

According to the LGOP, emissions assumed to be less than five (5) percent of overall emissions can be considered *de minimus* and therefore calculations are not required in order to meet compliance with the protocol. As noted, emission data gaps fall within this expected range of less than five (5) percent of total emissions; therefore, the 2007 inventory meets the requirements of the LGOP. However, as the intended purpose of the inventory is to develop a baseline from which a target and reduction plan can be assessed; future inventories could include all potential sources of emissions in order to capture as many mitigation opportunities as are available.

Internal Inventory Results Summary

Internal Inventory Results Direct GHG emissions for County operations for 2007 and 2020 are presented in **Figure B-4**. As discussed previously, 2007 GHG emissions were calculated based on the most recently available datasets and 2020 GHG emissions are based on unmitigated projections of County operations. These future emissions were not adjusted to reflect recent legislation that will result in statewide GHG emissions reductions. The distribution of these emissions by major sector for 2007 is presented in **Figure B-5**.

Figure B-4. Internal Inventory of GHG Emissions from County Operations (2007–2020)



Current (2007) Internal GHG Emissions

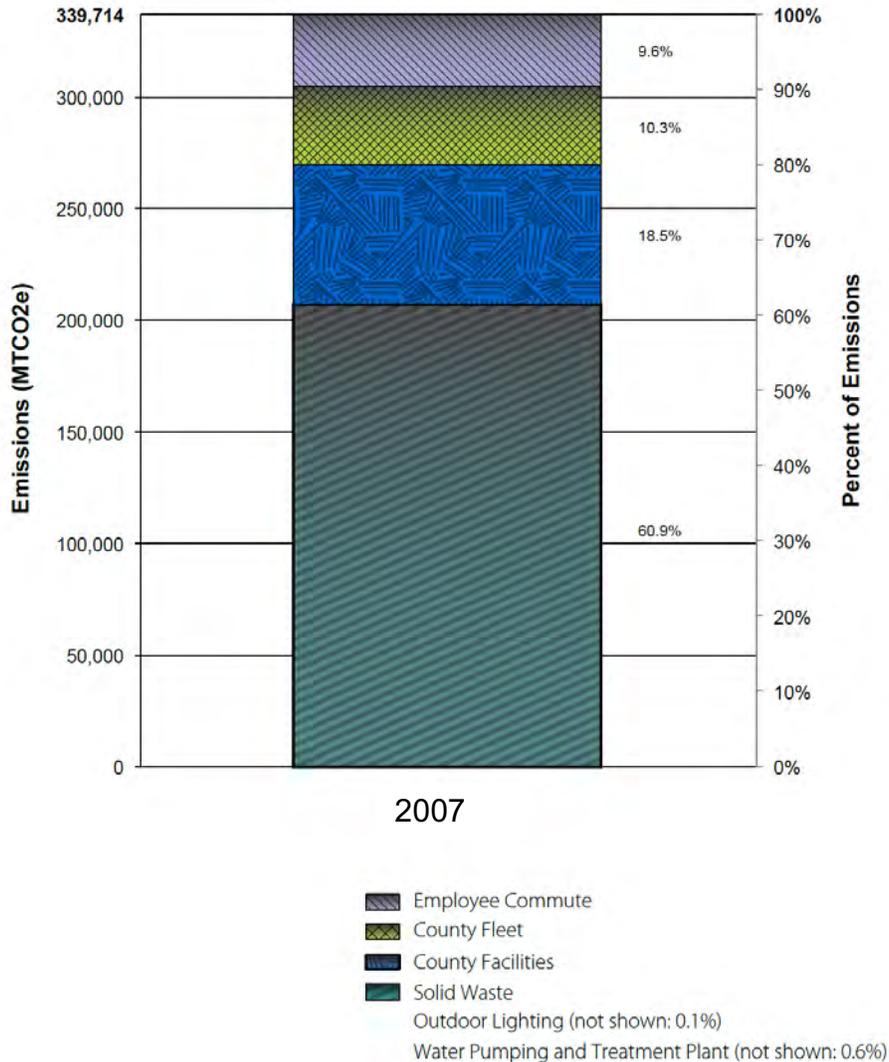
The County’s Current Internal Inventory is presented in **Table B-13** and **Figure B-5**. The largest source of GHG emissions is methane from waste management (approximately 61 percent). The next largest sector is electricity and natural gas consumption by County-owned and leased facilities (approximately 19 percent). In order of decreasing magnitude, the remaining sectors are County vehicle fleet emissions (approximately ten percent), employee commute emissions (approximately ten percent), water pumping and treatment facilities (approximately one percent) under County jurisdiction, and streetlights (approximately one-tenth of a percent).

The waste emissions from County-owned landfills are under the direct control of the County and, therefore, included in the Internal Inventory. Unlike most of the energy-related emissions (which are associated with the activities of the County government’s operations), the landfill emissions are a result of waste that has been generated by the entire San Bernardino population (incorporated and unincorporated areas) since the landfills were first opened. As a result, the waste emissions are significant and dominate other sectors in the internal inventory. **Figure B-5** graphically demonstrates this fact.

Table B-13. County Internal Emissions Summary for 2007 (MTCO₂e)

Sector	2007	
	Emissions	Percent
Solid Waste/landfills	206,817	60.88
County Facilities	62,981	18.54
County Vehicle Fleet	34,958	10.29
Employee Commute	32,490	9.56
Water Pumping and Treatment	2,192	0.65
Outdoor Lighting (street and traffic lights only)	276	0.08
Total	339,714	100

Figure B-5. County 2007 Internal Emissions by Sector (MTCO₂e)



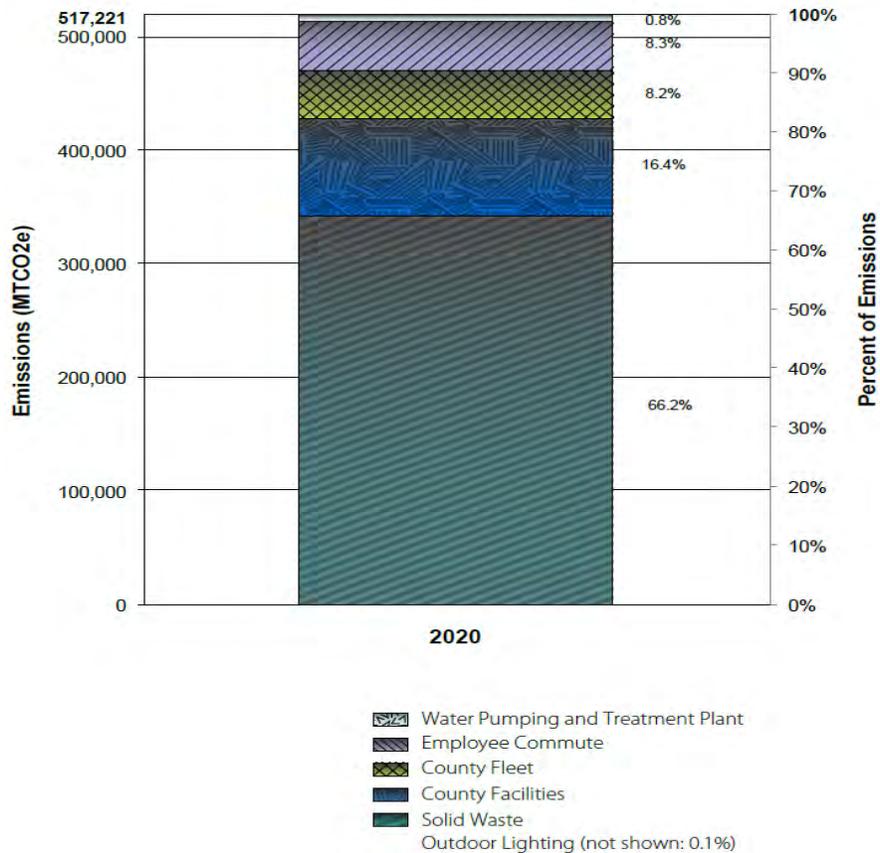
Projected (2020) Internal GHG Emissions

Unmitigated emission projections for 2020 are listed in **Table B-14** and presented in **Figure B-6** below. Unmitigated projections for 2020 are based on current energy consumption and unit emission rates adjusted by sector-specific growth rates provided by the County’s General Plan, County departments’ reports, and employee surveys, as well as information provided by County staff.

Table B-14. County 2020 Unmitigated Internal Emissions Summary (MTCO₂e)

Sector	2020	
	Emissions	Percent
Solid Waste/landfills	342,480	66.22
County Facilities	84,915	16.42
County Vehicle Fleet	42,526	8.22
Employee Commute	42,869	8.29
Water Pumping and Treatment	4,114	0.80
Outdoor Lighting (street and traffic lights only)	317	0.06
Total	517,221	100

Figure B-6. County 2020 Internal Emissions by Sector



Internal Reduction Plan

Emissions Reduction Methodology

Introduction

Appendix B provides information on calculations of GHG emission reductions related to Reduction Classifications 1, 2, and 3 (R1, R2 and R3), defined below, for the County operations. Emission reductions are defined in relation to the 2020 unmitigated emissions for the County's internal operations.

Emission reductions for the R1 measures were based on CARB methodology, as presented in the AB 32 Scoping Plan. In certain cases, CARB's calculations were modified to better estimate reductions for the County's operations, as described below. R2 measures were calculated using County-specific assumptions, where available, and custom methodologies for each sector of emission reductions presented below. The reduction methodologies for each emissions sector are based on a combination of widely accepted protocols established by USEPA, CCAR, CARB, and other relevant protocols, as appropriate, or on scientific studies. The following section presents the major assumptions and calculation methodologies used to estimate emission reductions for the Internal Reduction Plan.

Definition of Reduction Measure Classifications

Reduction Classification 1 (R1) includes all adopted, implemented, and proposed state and regional measures that will result in quantifiable GHG reductions for the County's internal operations. These measures may require County action to achieve the GHG reductions, but that action is limited and compulsory.

Reduction Classification 2 (R2) includes all quantifiable measures currently implemented or that will be implemented by the County, as well as any additional quantifiable measures that require County action and could further reduce the GHG emissions for the County's operations. R2 also includes any federal, state, and regional measures that require substantial action by the County to achieve the expected GHG reductions.

Reduction Classification 3 (R3) includes all other measures currently implemented or that will be implemented by the County, which were not quantified, but are included in the County's GHG Plan. These measures are either facilitative in nature or there are methodological issues that prevent their quantification.

Overall Internal Reductions

The 2007 GHG emissions level, the 2020 goal, and unmitigated emission projections for 2020 are presented in **Figure B-7**.

Figure B-7. Internal 2007, 2020 Unmitigated, and 2020 Emissions with Reduction Goal

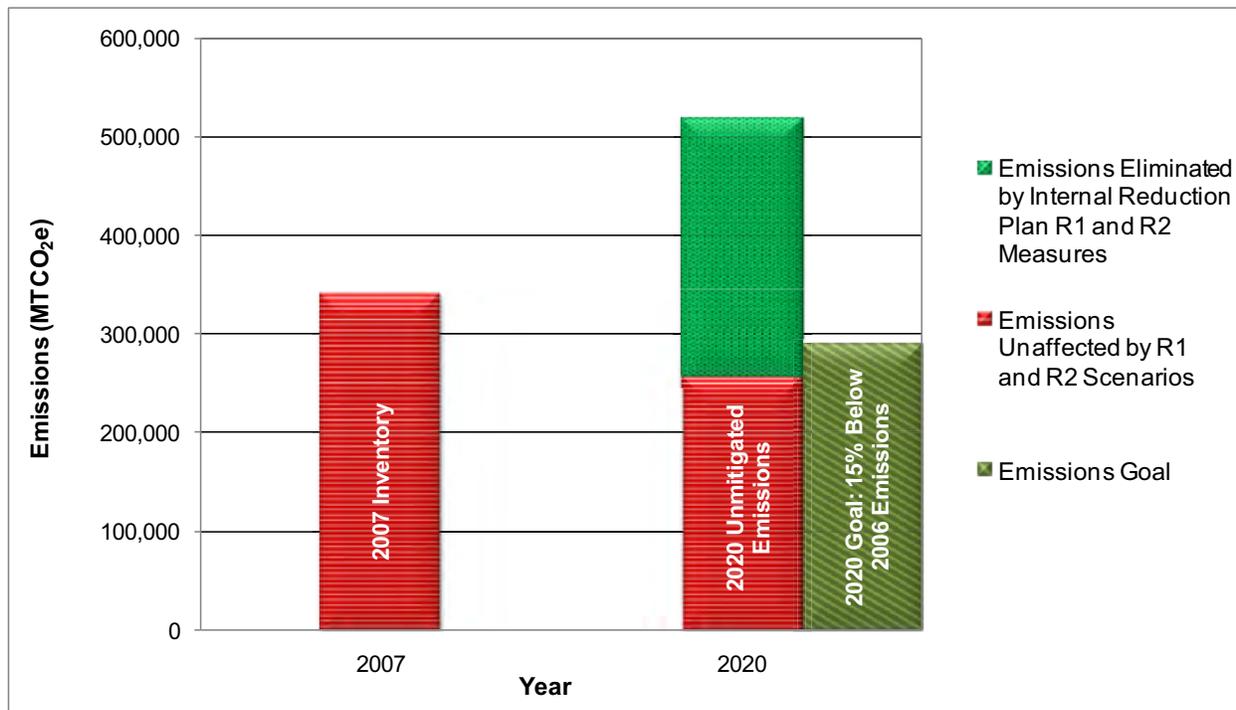


Figure B-7 also shows 2020 emissions after taking into account the reduction measures described in the sections below. Together, the sum of these reduction measures achieves more emissions reductions than necessary to meet the 2020 emissions target. The majority of these reduction measures are R2 measures, requiring County action to achieve the associated emissions reductions.

Evaluation of Concurrent Mitigation Measures

Several of the measures listed below were evaluated in combination with other measures. This is the case for measures that strengthen existing measures or for measures that rely on the implementation of specific measures before additional reductions can be achieved. In some cases, when considered independently, these measures might have resulted in greater emission reductions than when considered in combination. Where applicable, measures considered in combination are noted below.

Building/Energy Measures

This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* state, regional, and County building/energy measures that will result in future GHG reductions for the County's building usage.

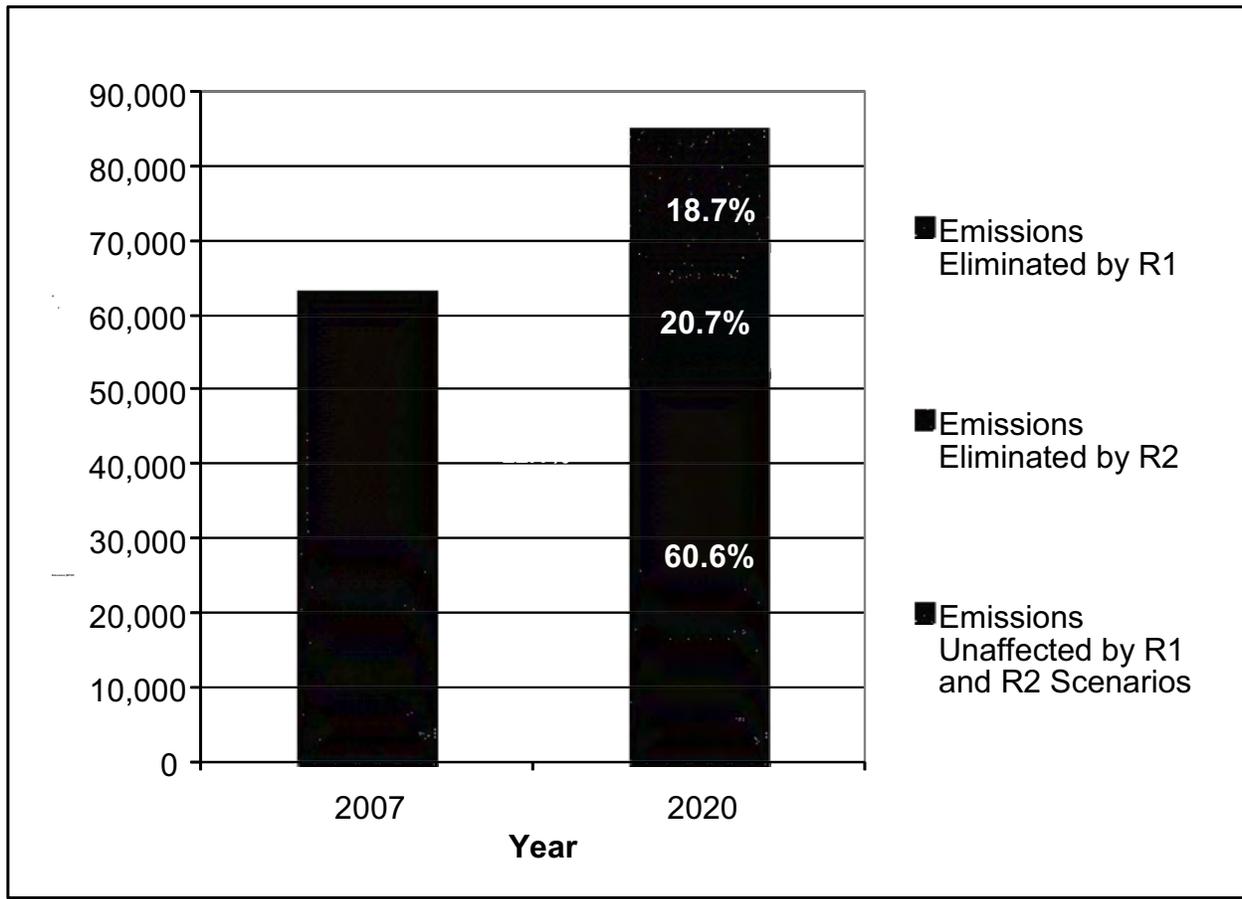
These measures and their associated emission reductions are shown below in **Table B-15**. Emission reductions in 2020 associated with each measure were calculated from the projected 2020 unmitigated emissions for the County internal buildings sector, assuming a continuation of the 2006 building energy usage composition (i.e., 73 percent from electricity and 27 percent from natural gas).

Table B-15. Internal (INT) GHG Emission Reductions from Building/Energy Measures

Reduction Classification and Reduction Measures	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state building energy measures that do not require County action		
R1E1-INT: Renewable Portfolio Standard (33 percent) ¹	8,258	9.7
R1E2-INT: AB 1109 Energy Efficiency Standards for Lighting	5,338	6.3
R1E3-INT: Title 24 standards for Non-Residential Buildings	2,296	2.7
R2: Existing and new building energy measures that require County action		
R2E1-INT: LEED Silver for New County Buildings	2,076	2.4
R2E2-INT: Retrofit Existing Buildings	1,566	1.8
R2E3-INT: Increase Use of Combined Heat and Power Systems	4,666	5.5
R2E4-INT: Office Equipment Procurement Standard	2,307	2.7
R2E5-INT: Leasing Procurement Standards	3,084	3.6
R2E6-INT: Install solar and other renewable energy sources on County Buildings	3,604	4.2
R2E7-INT: HVAC Retrofit Program	66	0.1
R2E8-INT: Solar PV Installation Projects	174	0.2
Total	33,435	39.4
R3: Existing and new building energy measures – reductions not quantified or relied upon to achieve reduction goal		
R3E1-INT: Utilize Incentives Offered by Southern California Edison Partnership		
R3E2-INT: Benchmark Existing Buildings		
R3E3-INT: Link Utility Payment/Energy Usage Data into the Computer Aided Facilities Management Database		
R3E4-INT: Train County Employees on Energy Efficiency and Conservation		
R3E5-INT: Apply Energy Saving Design Features		
R3E6-INT: Contracting Practices		
R3E7-INT: Small Tools and Equipment Use		

¹ This analysis incorporates the California Air Resources Board's adopted Renewable Portfolio Standard (RPS) goal of 33 percent, set forth in Executive Order S-14-08. This order states that 33 percent of energy used in California will be derived from renewable sources by the year 2020. The 33 percent RPS goal by year 2020 is considered by many to be a very aggressive goal that may not be met since it is possible that many energy providers will not meet the more modest RPS goal of 20 percent by 2010. If the more modest 20 percent RPS goal is used for this analysis, anticipated GHG emission reductions associated with this measure are 3,087 MTCO₂e in 2020.

Figure B-8. Internal GHG Emission Reductions from Building/Energy Measures



With the implementation of the emission reduction measures included in this Plan, the County will reduce building/energy emissions by 39 percent from 2020 unmitigated projections (19 percent and 21 percent eliminated by R1 and R2 measures respectively) such that reduced emissions in 2020 would be approximately 18 percent lower than 2007 emissions.

RI Building/Energy Measures

This section describes the existing or proposed state emission reduction measures for building energy efficiencies that will result in GHG reductions for County building usage, but do not require County action. The description of each measure is followed by the percent reduction in GHG from 2020 unmitigated for each measure.

RIE1A-INT and RIE1B-INT: Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the state’s Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires state agencies to take all appropriate actions to ensure the target is met. EO S-21-09 directs the California Air Resources Board (CARB) to adopt regulations to increase the RPS to 33 percent by 2020. The 33 percent RPS by 2020 goal is supported by CARB, though its feasibility is not certain due to current limitations in production and transmission of renewable

energy. Therefore, both RPS goals in 2020 were examined: 20 percent (Reduction Measure R1E1A-INT) and 33 percent (Reduction Measure R1E1B-INT).

Southern California Edison (SCE) is the primary electric utility in the County accounting for 97 percent of electricity provided to the County's LUA area.⁶ Since SCE provides the vast majority of power for the region, it was assumed that SCE generation characteristics were adequate to characterize the energy in the totality of the County's LUA area. This approach obviated the need to analyze the generation characteristics of the lesser energy area providers. SCE's 2007 level of renewable generation (as a percentage of its total portfolio) was 15.8 percent.

Emissions reductions associated with RPS (both the 20 percent and 33 percent RPS goals) were determined by calculating the increase in renewable energy production from SCE's 2007 production level for both R1E1A-INT and R1E1B-INT reduction measures. These increases in renewable energy production result in a GHG emission reduction of five (5) percent (Reduction Measure R1E1A-INT) and 20 percent (Reduction Measure R1E1B-INT). All renewable energy sources were assumed to be carbon neutral.⁷

In accordance with CARB protocol in the Assembly Bill (AB) 32 Scoping Plan, reductions from R1 and R2 energy efficiency and renewable energy measures presented below (as applied electricity emissions only) were subtracted from the 2020 unmitigated emissions before applying the RPS (R1E1A-INT, R1E1B-INT) reduction.⁸ This method avoids double counting of emissions reductions.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Increasing the SCE's renewable portfolio from 15.8 to 33 percent will cause a decrease in GHG emissions of 20 percent.
- Measures R1E2-INT, R1E3-INT, and R2E1-INT–R2E8-INT have been implemented.

This measure would result in a 10 percent reduction in total 2020 unmitigated emissions for County facility emissions.

R1E2-INT: AB 1109 Energy Efficiency Standards for Lighting (Residential and Commercial Indoor and Outdoor Lighting)

AB 1109 mandates that the California Energy Commission (CEC), on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other state efforts, shall be structured to reduce statewide electricity consumption in the following ways:

- At least 50 percent reduction from 2007 levels for indoor residential lighting by 2018.
- At least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

The following assumptions were used to calculate emission reductions attributed to this measure:

⁶ As detailed in the External Inventory.

⁷ California Air Resources Board Proposed Scoping Plan, pp. 44-46.

⁸ CARB 2008a, pp. I-29–30.

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- The percent electricity use from lighting in County-owned buildings is consistent with average usage in the California End Use Survey (CEUS). According to this survey, lighting accounts for 34.5 percent of a typical commercial building's electricity use—28.7 percent due to interior lighting and 5.8 percent due to exterior lighting.⁹
 - All 2020 unmitigated emissions from electricity use (73 percent of total 2020 unmitigated County facility emissions) are affected by this measure.
 - Energy savings of 25 percent associated with AB 1109 will yield an equivalent GHG emission reduction of 25 percent.

This measure would result in a 6 percent reduction in total 2020 unmitigated County facility emissions.

R1E3-INT: Title 24 Standards—Non-Residential Buildings

Title 24 Building Energy Efficiency standards increase in stringency on a triennial basis. The 2008 Title 24 standards have been released and are, according to an estimate from the CEC, approximately seven (7) percent more stringent for non-residential buildings. The Big Bold Strategies of the California Energy Efficiency Strategic Plan suggest a target of reaching zero net energy (ZNE) for all new commercial buildings by 2030; although the California Public Utilities Commission (CPUC) does not detail how this will be possible, the continued increase in stringency of Title 24 standards is said to be of paramount importance towards reaching this goal.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The reduction in emissions from 2020 unmitigated emissions levels was calculated assuming that all new emissions come from newly built County-owned buildings.
- It was assumed that standards would increase seven (7) percent triennially.
- New buildings were broken down and labeled into five (5) groups according to the date of the code under which they are/will be permitted: 2005, 2008, 2011, 2014, and 2017.
- The ratio of owned buildings increased from 2007 to 2020, and this change was also accounted for in the five (5) groups described above.

This measure would result in a 3 percent reduction in total 2020 unmitigated County facility emissions.

R2 Building/Energy Measures

This section describes the existing or proposed County Building Energy measures that will result in quantifiable GHG emission reductions and the methodology used to calculate the reductions. A description of each measure is followed by the resulting GHG reductions.

Each measure takes into account appropriate emission reductions achieved with R1 building/energy measures and any appropriate preceding R2 building/energy measures, thereby eliminating any potential “double-counting” of emission reductions. For example the reductions due to Title 24 Energy Efficiency Standards were subtracted from 2020 unmitigated emissions before analyzing the effects of the proposed Leadership in Energy and

⁹ California End Use Survey: <<http://capabilities.itron.com/CeusWeb/chart.aspx>>.

Environmental Design (LEED) Silver for new buildings requirement, increased use of CHP systems, and the installation of renewable energy/solar on County buildings measures.

R2E1-INT: Leadership in Energy and Environmental Design (LEED) Silver for New County Buildings

The County currently implements a policy that requires construction of new buildings over 5,000 square feet and major renovations of existing buildings to be certified as LEED Silver *whenever fiscally sensible*. The minimum level of energy performance to acquire the LEED Silver rating is 14 percent above code for newly constructed buildings (seven [7] percent for retrofits).

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would only affect buildings owned by the County, which represent 75.5 percent of total 2020 unmitigated county facility emissions.
- Buildings would be built to the minimum energy performance for LEED Silver of 14 percent above code.
- It was assumed that energy performance gains from LEED Silver *retrofits* would be captured within other measures (i.e. retro-commissioning and AB1109). Retrofits were; therefore, not included in these calculations in order to avoid possible double counting issues.
- Energy savings of 14 percent associated with LEED silver requirements will yield an equivalent GHG emission reduction of 14 percent.
- Measure R1E3-INT has been implemented.

This measure would result in a 2 percent reduction in total 2020 unmitigated County facility emissions.

R2E2-INT: Retrofit Existing Buildings

This measure requires retrofit of a portion of the County's buildings that existed in 2007. Analysis shows a median retrofit cost of \$0.27 per square foot, energy savings of 15 percent, and a simple payback period of 0.7 years.¹⁰

The following assumptions were used to calculate emission reductions attributed to this measure:

- Only buildings existing in 2007 and owned by the County will be retrofitted
- Due to the fact that not all buildings are large enough or suitable for retrofit, 25 percent of the County-owned buildings would be retrofitted by 2020. This is considered to be a conservative estimate, taking into account the fraction of owned buildings for which this measure is feasible and potential overlap with emission reductions associated with the LEED measure (R2E1-INT) above.
- Energy savings of 15 percent associated with the retrofit process will yield an equivalent GHG emission reduction of 15 percent at each building site.

¹⁰ The Cost-Effectiveness of Commercial-Building Commissioning, LBNL: <<http://eetd.lbl.gov/emills/PUBS/Cx-Costs-Benefits.html>>.

-
- Measures R1E2-INT and R2E3-INT have been implemented.

This measure would result in a 2 percent reduction in total 2020 unmitigated County facility emissions.

R2E3-INT: Increase Use of Combined Heat and Power Systems

This measure requires the installation of combined heat and power systems on a limited number of County-owned buildings. Combined heat and power (CHP) systems utilize waste heat created during distributed power generation to provide heat locally. This technology lowers energy needed for heating and hence also lowers the GHG emissions associated with this heating.

R2E3-INT captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB 32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 gigawatt hours (GWh) statewide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible CHP portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. By 2020, this requirement will reduce emissions in California by approximately 6.7 MMTCO₂e, representing 7.6 percent of emissions from all electricity in the state.¹¹

- Future CHP feasibility is highly dependent upon natural gas prices since they are directly proportional to payback periods. A feasibility study commissioned by the CEC suggests that CHP will have a significant place in the utilities' loading order.¹² The exact feasibility for the County is difficult to predict at this point due to uncertainties in future natural gas prices as well as an uncertain future regulatory framework. Nevertheless, a substantial, yet conservative, estimate of reduction is calculated based on the following assumptions:
 - CHP systems reduce GHG emissions by 30 percent, as shown by a typical run of the USEPA's CHP Emissions Calculator¹³.
 - CHP would be installed at the Arrowhead Regional Medical Center.
 - Measures R1E3-INT, R2E1-INT and R2E2-INT have been implemented.

This measure would result in a 5 percent reduction in total 2020 unmitigated County facility emissions.

R2E4-INT: Office Equipment Procurement Standard

This measure requires that all office equipment purchased for County facilities will be ENERGY STAR rated.

The following assumptions were used to calculate emission reductions attributed to this measure:

- All 2007 office equipment would be replaced by 2020.
- The procurement standard only affects emissions from electricity use in owned and leased

¹¹ California Air Resources Board 2008a, 2009a.

¹² California Energy Commission, Assessment of California Combined Heat and Power Market, p. xii.

¹³ <http://www.epa.gov/chp/documents/chp_emissions_calc.xls>.

buildings.

- Office equipment accounts for 7.1 percent of the average commercial building's electricity use.¹⁴
- ENERGY STAR office equipment would reduce, on average, 50 percent of energy consumption from currently used office equipment.¹⁵
- Energy savings of 53 percent associated with ENERGY STAR office equipment will yield an equivalent GHG emission reduction of 53 percent.

This measure would result in a 3 percent reduction in total 2020 unmitigated County facility emissions.

R2E5-INT: Leasing Procurement Standard

This measure requires that buildings leased by the County have at least 20 percent lower energy intensity than leased buildings in 2007. The proposed leasing procurement standard requires benchmarking for any buildings being considered for lease by the County. Benchmarking is the process of creating a measure of a building's energy intensity, expressed in kilowatt hours (kWh) per square foot and cubic feet natural gas per square foot. The leasing procurement standard will require that all buildings leased by the County have an energy intensity that is at least 20 percent lower than the 2007 energy intensity of 14.6 kWh/square foot and 14.2 cubic feet natural gas per square foot.

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure would only affect 2020 unmitigated emissions from leased buildings.
- A 20 percent reduction in energy intensity for leased building energy use will yield an equivalent GHG emission reduction of 20 percent.

This measure would result in a 4 percent reduction in total 2020 unmitigated County facility emissions.

R2E6-INT: Install Solar and Other Renewable Energy Sources on County Buildings

This measure requires installation of renewable energy sources on a portion of County-owned buildings. The installation of renewable energy sources will lower the amount of fossil fuel energy used by the County and emitted as indirect emissions by the County's main utility, Southern California Edison. Currently the most convenient source for localized renewable energy generation is solar photovoltaic panels, which will likely constitute most of the County's renewable installations. Other sources such as geothermal or small-scale wind power may be utilized as well contingent upon local conditions and the availability of future technologies.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Renewables would offset ten (10) percent of the County's 2020 unmitigated emissions from owned buildings. This conservative estimate reflects the difficulty in financing

¹⁴ California End Use Survey: <<http://capabilities.itron.com/CeusWeb/chart.aspx>>.

¹⁵ ENERGY STAR office equipment uses 30–75 percent less energy than conventional equipment (Energy Star 2009).

small-scale renewable projects as well as the fact that not all County buildings are suitable for renewable energy development.

- This reduction would only affect emissions from electricity use.
- Renewable sources are carbon neutral.
- Measures R1E2-INT, R1E3-INT, R2E1-INT–R2E5-INT, R2E7-INT, and R2E8-INT, have been implemented.

This measure would result in a 4 percent reduction in total 2020 unmitigated County facility emissions.

R2E7-INT: HVAC Retrofit Program

The County-wide HVAC retrofit program involves the installation of variable frequency drives (VFD), economizers, and controls to various mechanical systems. The buildings included in the program are: County Government Center, Old Hall of Records, Library Administration and Regional Youth Education Facility (RYEF). Funding for this Program will be obtained through an Energy Efficiency Conservation Block Grant from the federal government.

The following assumptions were used to calculate emission reductions attributed to this measure:

- This measure will result in an average annual energy savings of 276,678 kWh.

This measure would result in a 0.1 percent reduction in total 2020 unmitigated County facility emissions.

R2E8-INT: Solar Photovoltaic Installation Projects

The County's Program for installing solar photovoltaic panels on County-owned buildings has identified two (2) specific buildings suitable for renewable energy generation. These systems have been sized and funding has been applied for through the Energy Efficiency Conservation Block Grant Program. The following sites have been chosen: the High Desert Government Complex (286 kW) and the Joshua Tree New County Building (115 kW).

The following assumptions were used to calculate emission reductions attributed to this measure:

- These two (2) projects are assumed to result in an average annual energy savings of 707,176 kWh.

This measure would result in a 0.2 percent reduction in total 2020 unmitigated County facility emissions.

R3 Building/Energy Measures

This section describes the reduction measures for building/energy R3 that were not quantified or relied upon to achieve the County's reduction target. The description of each measure is followed by a discussion of the basis for non-quantification.

R3E1-INT: Utilize Incentives Offered by Southern California Edison Partnership

This measure involves taking advantage of SCE partnership rebates (available until December 2011):

- Heating, Ventilating, and Air Conditioning (HVAC) and RCx = \$0.24/kWh

-
- Motors/VFDs/Compressors/Others = \$0.18/kWh
 - Lighting = \$0.15/kWh

This measure was not quantified because savings obtained through taking advantage of these incentives are included in the retro-commissioning and AB1109 measures already quantified.

R3E2-INT: Benchmark Existing Buildings

This measure involves the County's use of ENERGY STAR Portfolio Manager to benchmark County-owned buildings. Portfolio Manager helps track and assess energy and water consumption within individual buildings as well as across your entire building portfolio. Portfolio Manager will be used to rate the County's buildings' energy performance compared to similar buildings, set investment priorities, and verify and track progress of improvement projects.

Benchmarking would not directly result in emissions reductions and therefore was not quantified. Emissions reductions from existing building energy efficiency are already captured in the retro-commissioning and AB 1109 measures quantified above.

R3E3-INT: Link Utility Payment/Energy Usage Data into the Computer Aided Facilities Management Database

This measure involves linking the utility payment database [Blind Identification Database System or ("BIDS")] and other data sources for energy usage data with the newly developed Computer Aided Facilities Management (CAFM) database to greatly enhance the County's energy usage data tracking and facilitate energy analysis on all County buildings.

Linking these data sources will not result in actual GHG emissions reductions, and therefore this measure was not quantified.

R3E4-INT: Educate County Employees on Energy Efficiency and Conservation

This measure involves institutionalizing energy efficiency and conservation practices within the County with the training of County employees. This includes training for facility managers and architecture and engineering personnel on energy efficient building science as well as training on energy conservation to all County employees.

This measure does not directly result in quantifiable emissions reductions and therefore was not analyzed in the section above.

R3E5-INT: Apply Energy Saving Design Features

This measure involves the County's use of energy saving design features such as the following:

- East–west long axis oriented buildings
- Operable external shading devices on south facing facades
- Double skin facades
- Shade trees
- Inclusion of Atria in design—internal green wall
- Tightly sealed buildings to prevent air leakage with energy recovery ventilation
- Enhanced roof insulation

-
- Centralized heating and cooling
 - Chilled ceiling and chilled beam cooling
 - Floor radiant cooling
 - Sensible heat exchangers
 - Vacuum insulated panels in doors

Energy savings from such design features are already included in the LEED Silver for New Construction measure, which captures the energy savings from these design features. Additional energy savings are captured in the ramping up of Title 24 standards.

R3E6-INT Contracting Practices that Encourage GHG Emission Reduction

The County will establish bidding standards and contracting practices that encourage GHG emissions reduction, including preferences or points for the use of low or zero emissions equipment, recycled materials, and provider implementation of other green management practices.

R3E7-INT Small Tools and Equipment Associated with Building Use

The County will install outdoor electrical outlets on buildings to support the use of electric lawn and garden equipment, and other tools that would otherwise be run with small gas engines or portable generators.

Fleet/Fuels Measures

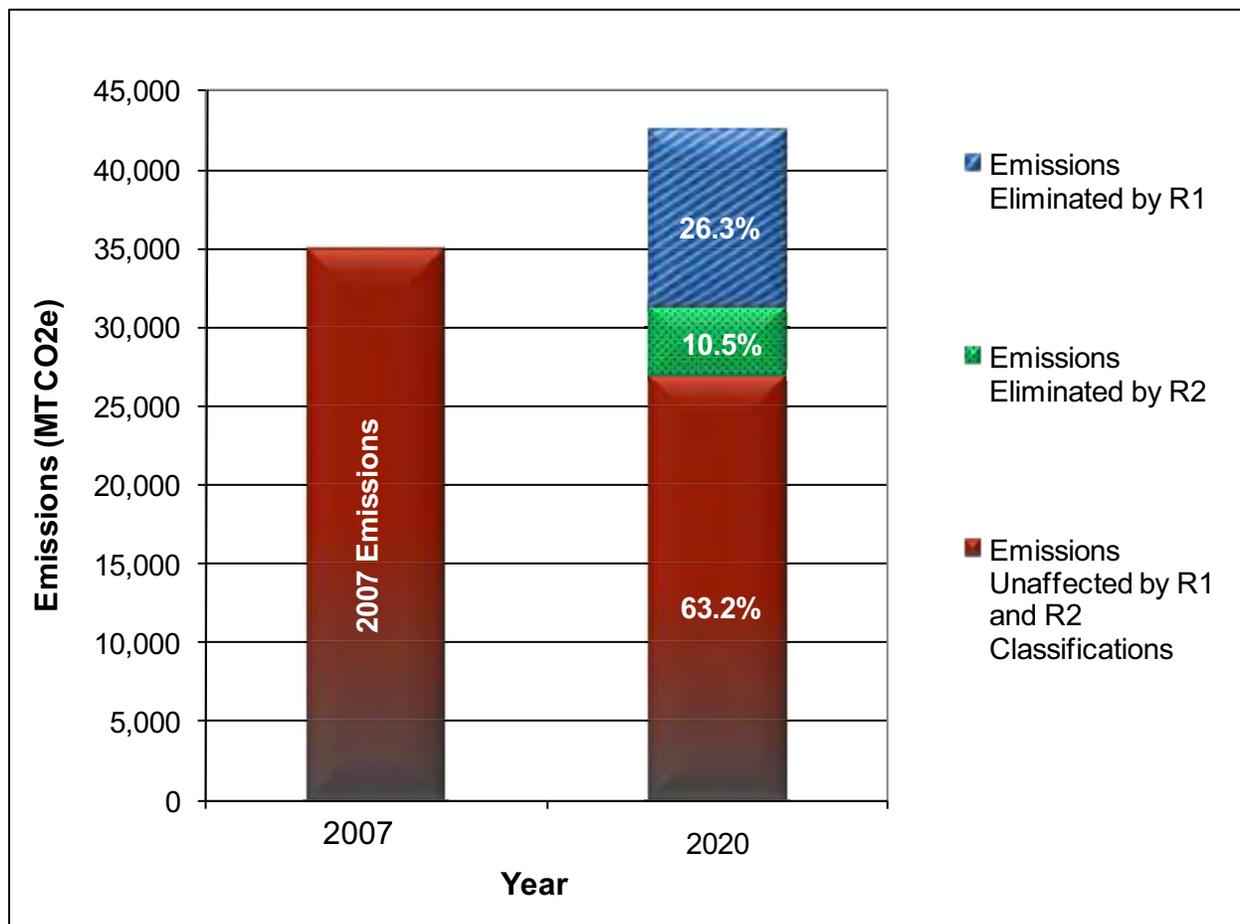
This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* state, regional or County transportation measures that will result in future GHG reductions. The total estimated GHG reductions from the reduction measures included in Reduction Classifications R1 and R2 are presented below in **Table B-16**. Emission reductions for each measure are applied to the projected 2020 unmitigated emissions for the appropriate vehicle type. The total reduction attributed to these measures is in the amount of 16,027 MTCO₂e, which is a 38 percent reduction from the total 2020 unmitigated vehicle fleet emissions.

Table B-16. Internal GHG Emission Reductions from Vehicle/Fuels Measures

Reduction Classification and Reduction Measure	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional transportation measures that do not require County action		
R1F1-INT: Assembly Bill 1493 (Pavley I) California Light-Duty Vehicle GHG Standards	5,328	12.5
R1F2-INT: Assembly Bill 1493 (Pavley II) California Light-Duty Vehicle GHG Standards	769	1.8
R1F3-INT: Executive Order S-1-07 (Low Carbon Fuel Standard)	2,946	6.9
R1F4-INT: Tire Pressure Program	106	0.2
R1F5-INT: Low Rolling Resistance Tires	31	0.1
R1F6-INT: Low Friction Engine Oils	539	1.3
R1F7-INT: Cool Paints and Reflective Glazing	171	0.4
R1F8-INT: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)	153	0.4
R1F9-INT: Medium-and Heavy-Duty Vehicle Hybridization	82	0.2
R1F10-INT: Rule 1191—Clean On-Road Light- and Medium-Duty Public Fleet Vehicles	80	0.2
R1F11-INT: Rule 1193—Clean On-Road Residential and Commercial Refuse Collection Vehicles	856	2.0
R1F12-INT: Rule 1196—Clean On-Road Heavy-Duty Public Fleet Vehicles	118	0.3
R2: Existing and new vehicle fleet measures that require County action		
R2F1a-INT: Current fleet turnover	1,831	4.3
R2F1b-INT: Replace All Passenger/Light-Duty Vehicles by 2020	2,600	6.1
R2F2-INT: Replace All Medium and Heavy-duty Vehicles by 2020	36	0.1
Total	15,647	37
R3: Existing and new vehicle fleet measures—reductions not quantified or relied upon to achieve reduction goal		
R3F1-INT: Implement Accelerated Vehicle Fleet Turnover for “Other “ Vehicles		
R3F2-INT: Use Hybrid/ULEV Vehicles		
R3F3-INT: Implement Early Tire Inflation Program		

Reduction Classification and Reduction Measure	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R3F4-INT: Implement Anti-Idling Measures		
R3F5-INT: Implement Smart Driving Policy		
R3F6-INT: Implement Vehicle Maintenance Program		
R3F7-INT: Senate Bill 375, Statutes 2008		
R3F8-INT: California's Low-Emission Vehicle (LEV) Program		
R3F9-INT: Zero Emission Vehicle (LEV) Regulations		
R3F10-INT: Fleet and Equipment Management and Monitoring		

Figure B-9. Internal Emission Reductions from Vehicle/Fuels Measures



With the implementation of the emission reduction measures included in this Plan, the County will reduce vehicle fleet emissions by 37 percent (26 percent and 11 percent emissions eliminated by R1 and R2 measures, respectively) from 2020 unmitigated projections. Reduced emissions in 2020 would be approximately 23 percent lower than 2007 emissions.

RI Fleet/Fuels Measures

This section describes the existing or proposed state emission reduction measures that will result in GHG reductions for the County transportation fleet, but do not require County action. The description of each measure is followed by the percent reduction in GHG from 2020 unmitigated for each measure.

RIF1-INT: Assembly Bill 1493: (Pavley I) California Light-Duty Vehicle GHG Standards

AB 1493 (Pavley) required the CARB to adopt regulations that will reduce GHG from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 MMTCO_{2e}, representing 17.3 percent of emissions from passenger/light-duty vehicles in the state.¹⁶ Manufacturers have flexibility in meeting these standards through a combination of reducing tailpipe emissions of GHGs and implementing systems to mitigate fugitive emissions of hydrofluorocarbons (HFCs) from vehicle air conditioning systems. The emission standards become increasingly more stringent through the 2016 model year.¹⁷ The regulations were adopted by CARB in their final form on August 4, 2005, pursuant to AB 1493 signed into law in 2002. Enactment of this regulation in California requires a waiver from the USEPA that was granted in 2009.

This regulation will result in a 17 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 12 percent reduction of total 2020 unmitigated fleet emissions.

RIF2-INT: Assembly Bill 1493: (Pavley II) California Light-Duty Vehicle GHG Standards

California committed to further strengthening the AB 1493 standards beginning in 2017 to obtain a 45 percent GHG reduction from 2020 model year vehicles. By 2020, California is committed to implement revised, more stringent GHG emission limits (the Pavley Phase 2 rules). California's requirements would reduce California GHG emissions by 31.7 MMTCO_{2e} in 2020, 69 percent more than the 18.8 MMTs reductions under the federal rules in that year. By 2020, this requirement will reduce emissions in California by approximately 4.0 MMTCO_{2e}, representing 2.5 percent of emissions from passenger/light-duty vehicles in the state.¹⁸

This regulation will result in a 2 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 2 percent reduction of total 2020 unmitigated fleet emissions .

RIF3-INT: Executive Order S-1-07 (Low Carbon Fuel Standard)

EO S-1-07, the Low Carbon Fuel Standard (LCFS), was issued on January 18, 2007. The LCFS will require a reduction of at least ten (10) percent in the carbon intensity of California's transportation fuels by 2020. CARB identified the LCFS as an early action item with a regulation to be adopted and implemented by 2010. The CARB AB 32 Scoping Plan estimates that the LCFS will result in a 15 MMTCO_{2e} reduction in California by 2020, representing 6.9 percent of emissions from all carbon-based fuels consumed for transportation in the state.¹⁹

This regulation will result in a 7 percent reduction from total 2020 unmitigated fleet emissions .

¹⁶ California Air Resources Board 2008a, 2009.

¹⁷ California Air Resources Board 2002.

¹⁸ California Air Resources Board 2008a, 2009.

¹⁹ California Air Resources Board 2008a, 2008b.

R1F4-INT: Tire Pressure Program

The Tire Pressure Strategy was identified as one of the AB 32 Early Actions. While current federal law requires auto manufacturers to install tire pressure monitoring systems in all new vehicles beginning September 1, 2007, owners of older vehicles will lack this important tool to help them reduce their climate change emissions. The strategy involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. Specifically, the strategy seeks to ensure that tire pressure in older vehicles is monitored by requiring that tires be checked and inflated at regular service intervals. One potential approach would be to require all vehicle service facilities, such as dealerships, maintenance garages, and Smog Check stations, to check and properly inflate tires. It is also anticipated that signage at fueling stations would clearly indicate the availability of compressed air at no charge. CARB is currently investigating various options to ensure that tire pressures in older vehicles are also properly maintained.²⁰ By 2020, this requirement will reduce emissions in California by approximately 0.55 MMTCO₂e, representing 0.3 percent of emissions from passenger/light-duty vehicles in the state.²¹

This regulation will result in a 0.3 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 0.2 percent reduction of total 2020 unmitigated fleet emissions.

R1F5-INT: Low Rolling Resistance Tires

This measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. A reduction in GHG emissions results from reduced fuel use. CARB staff estimates that reducing the rolling resistance of tires by ten (10) percent results in a two (2) percent increase in fuel efficiency. For the tire tread program, a two-phased approach is needed, beginning with data gathering and education, followed by the development and adoption of tire rolling resistance standards.²² By 2020, this requirement will reduce emissions in California by approximately 0.3 MMTCO₂e, representing 0.2 percent of emissions from passenger/light-duty vehicles in the state.²³

This regulation will result in a 0.1 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 0.07 percent reduction of total 2020 unmitigated fleet emissions.

R1F6-INT: Low Friction Engine Oils

This AB 32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. Engine oil formulations can impact a vehicle's GHG emissions, because the more easily the internal parts of the engine move, the more efficiently the engine will run. This, in turn, reduces the engine load and fuel used. CARB estimates a 2 percent efficiency increase based on results from research studies. CARB estimates the efficiency will be achieved in about 85 percent of vehicles comprising the light-duty fleet. The California 2020 GHG emissions inventory from light-duty vehicles is 160.8 MMTCO₂e for all fuels. Entities that could be affected by the low friction engine oils measure, depending on the point of regulation, include lube oil manufacturers, automobile manufacturers, and auto-repair shops.²⁴ By 2020, this requirement will reduce emissions in California by

²⁰ California Air Resources Board 2007b, 2007c, 2008d.

²¹ California Air Resources Board 2008a, 2009.

²² California Air Resources Board 2007c, 2008e.

²³ California Air Resources Board 2008a, 2009.

²⁴ California Air Resources Board 2008e, 2007c.

approximately 2.8 MMTCO₂e, representing 1.7 percent of emissions from passenger/light-duty vehicles in the state²⁵.

This regulation will result in a 2 percent reduction from 2020 unmitigated passenger/light-duty vehicle emissions and a 1 percent reduction of total 2020 unmitigated fleet emissions.

RIF7-INT: Cool Paints and Reflective Glazing

Cool Paints was identified as an AB 32 Early Action strategy, to be in place no later than January 1, 2010. This strategy is based on measures to reduce the solar heat gain in a vehicle parked in the sun. A cooler interior would make drivers less likely to activate the air conditioner, which increases CO₂ emissions. Potential approaches include reformulation of paint to reflect near-infrared sunlight, parked car ventilation, and solar reflective window glazing. It is expected that cool paints, together with reflective glazing, will reduce the soak temperature of the typical vehicle parked in the sun by five (5) to ten (10) degrees Celsius.²⁶ By 2020, this requirement will reduce emissions in California by approximately 0.89 MMTCO₂e, representing 0.6 percent of emissions from passenger/light-duty vehicles in the state.²⁷

This regulation will result in a 0.6 percent reduction from 2020 unmitigated passenger/light duty vehicle emissions and a 0.4 percent reduction of total 2020 unmitigated fleet emissions.

RIF8-INT: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB-approved technology to reduce aerodynamic drag and rolling resistance. The estimated fuel reduction nationwide is approximately 615 million gallons of diesel which results in a GHG emissions reduction of 6.4 MMTCO₂e by 2020.²⁸ By 2020, this requirement will reduce emissions in California by approximately 0.93 MMTCO₂e, representing 1.9 percent of emissions from heavy-duty vehicles in the state.²⁹

This regulation will result in a 2 percent reduction from 2020 unmitigated heavy-duty vehicle emissions and a 0.4 percent reduction of total 2020 unmitigated fleet emissions.

RIF9-INT: Medium- and Heavy-Duty Vehicle Hybridization

Hybrid electric technology offers the potential to significantly reduce GHG emissions and improve fuel efficiency. Hybrid technology provides the greatest benefit when used in vocational applications that have significant urban, stop-and-go driving, idling, and power take-off operations in their duty cycle. Such applications include parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks. These entities may be affected by this measure. The implementation approach for this measure is to adopt a regulation and/or incentive program that reduces the GHG emissions of these types of new trucks sold in California. This measure has the potential to reduce diesel combustion by 500,000 gallons per day and reduce GHG emissions by 0.5 MMTCO₂e in 2020, representing 0.2 percent

²⁵ California Air Resources Board 2008a, 2009.

²⁶ California Air Resources Board 2007b, 2007c, 2008d.

²⁷ California Air Resources Board 2008a, 2009.

²⁸ California Air Resources Board 2008b, 2008e.

²⁹ California Air Resources Board 2008a, 2009.

of emissions from all on-road mobile sources in the state.³⁰ This reduction is also equivalent to a one (1) percent reduction of emissions from all heavy-duty trucks in the state.

This regulation will result in a one (1) percent reduction from 2020 unmitigated heavy-duty vehicle emissions; a 0.2 percent reduction from total 2020 unmitigated fleet emissions.

Regional Transportation Measures: South Coast Air Quality Management District (SCAQMD) Fleet Rules

The following rules are primarily intended to reduce air toxic and criteria pollutant emissions by requiring low-emitting gasoline/diesel or alternative-fuel vehicles. Alternative-fuel vehicles required by these regulations produce lower GHG emissions than their gasoline and diesel counterparts.

RIF10-INT: SCAQMD Rule 1191: Clean On-Road Light- and Medium-Duty Public Fleet Vehicles

This rule requires public fleets in the SCAQMD's jurisdiction that are operating passenger car, light-duty truck, or medium-duty vehicle fleets to acquire low-emitting gasoline or alternative-fuel vehicles when procuring new vehicles of these types. This rule applies to government agencies or special districts with 15 or more non-exempt vehicles. Unlike Pavley, this rule applies to medium- as well as light-duty vehicles (emergency vehicles are exempt).

The following assumptions were used to estimate GHG emission reductions associated with this SCAQMD requirement:

- The GHG standards for new passenger car, light-duty truck, or medium-duty vehicles acquired by the County are consistent with Pavley I and II regulations. Even though the Pavley regulations apply to passenger cars and light-duty trucks, the SCAQMD requirements are sufficiently stringent so as to be considered equivalent standards for medium-duty vehicles.
- 56 percent of medium-duty vehicles are subject to this rule (emergency vehicles are exempt).
- 86 percent of all medium-duty vehicles would be turned over to new vehicles by 2020.

This regulation will result in a 10 percent reduction of 2020 unmitigated medium-duty vehicle emissions and a 0.2 percent reduction of total 2020 unmitigated fleet emissions.

RIF11-INT: Rule 1193: Clean On-Road Residential and Commercial Refuse Collection Vehicles

For public and private solid waste collection fleets, this rule requires fleet operators to acquire alternative-fuel refuse collection heavy-duty vehicles when procuring these vehicles for use within the SCAQMD's jurisdiction. This rule applies to government agencies or private entities with 15 or more solid waste collection vehicles.

The following assumptions were used to estimate GHG emission reductions associated with this SCAQMD requirement:

- The average fuel economy of garbage trucks in the United States in 2001 was 2.8 miles per

³⁰ California Air Resources Board 2008a, 2009.

gallon (mpg).³¹

- 82 percent of refuse collection vehicles will be retired by 2020 (same turnover assumed for all heavy-duty vehicles) and these fleets will grow 1 percent per year.
- All new refuse collection vehicles would use compressed natural gas (CNG) instead of diesel fuel. Heavy-duty vehicles running on CNG produced by natural gas from California emit 18.3 percent less GHG emissions than the same vehicles running on LCFS compliant diesel fuel.³²
- This regulation results in a 15 percent reduction of 2020 unmitigated refuse vehicle emissions and a 2 percent of total 2020 unmitigated fleet emissions.

R1F12-INT: Rule 1196: Clean On-Road Heavy-Duty Public Fleet Vehicles

To reduce air toxic and criteria pollutant emissions, this rule requires public fleets in the SCAQMD's jurisdiction operating heavy-duty vehicle fleets to acquire alternative-fuel, dual-fuel, or dedicated gasoline heavy-duty vehicles when procuring or leasing these vehicles for use within the SCAQMD's jurisdiction. This rule applies to government agencies, special districts, and school districts with 15 or more heavy-duty vehicles (emergency vehicles are exempted).

The following assumptions were used to estimate GHG emission reductions associated with this SCAQMD requirement:

- The 35.3 percent of non-waste hauler heavy-duty vehicles in the County's fleet are subject to this rule (fire department vehicles excluded).
- Since 82 percent of heavy-duty vehicles in the fire department fleet will be retired by 2020, it was assumed that 82 percent of all heavy-duty vehicles would be retired by 2020.
- All new heavy-duty vehicles would use CNG instead of diesel fuel.
- Heavy-duty vehicles running on CNG produced by natural gas from California emit 18.3 percent less GHG emissions than the same vehicles running on LCFS compliant diesel fuel.³³
- This regulation results in a 5 percent reduction of 2020 unmitigated emissions from heavy-duty vehicles and a 0.3 percent of total 2020 unmitigated fleet emissions.

R2 Fleet/Fuels Measures

This section describes the existing and new County emission reduction measures that will result in quantifiable GHG reductions for the County transportation fleet, and require County action.

Transportation Fleet Background

Several County agencies maintain and operate their own vehicle fleet, including the following: Fleet Management Department (Motor Pool and Non Motor Pool), County Fire Department, Public Works/Flood Control, Sheriff's Department, Solid Waste and Special Districts. A more detailed description of the operations of these departments is provided below, with a description of implemented or proposed GHG reduction measures provided by each department/district, where applicable:

³¹ INFORM 2003.

³² California Air Resources Board 2008c.

³³ California Air Resources Board 2008c.

Fleet Management Department (Motor Pool and Non Motor Pool). The Fleet Management Department provides vehicles, equipment, and services to the officials and employees of the County. Services include the acquisition, maintenance, repair, modification, and disposal of vehicles and other related equipment. [It should be noted that the County Fire Department, Sheriff's Department and Special Districts are authorized to operate their respective fleets independent of Fleet Management.] Fleet Management also operates a motor pool, which has ownership and/or maintenance responsibility for approximately 1,700 automobiles, vans, pick-up trucks, and various specialty vehicles assigned to County departments. The motor pool coordinates the collection and distribution of replacement, fuel, maintenance, repair, and other operational costs of fleet vehicles. The Fleet Management Department measures include:

- Replace sedans with hybrids (*in process*). There are currently over 100 hybrid sedans and sports utility vehicles (SUVs) (six [6] percent of the County's 1,688 vehicles). Hybrids are purchased any time a sedan is replaced (with some exceptions), and in many cases when an SUV is replaced. When it is not feasible to purchase a hybrid vehicle, the vehicle purchased will have the lowest emissions rating possible for that type of vehicle.
- Acquire ultra low emission vehicle (ULEV) vehicles when feasible (*in process*). A total of 44 percent of the fleet is ULEV.
- Purchase electric vehicles to replace conventional fuel vehicles (*in process*). Nine (9) electric vehicles have been purchased for evaluation to replace nine (9) conventionally powered vehicles. If successful, more will be purchased.
- Expand fleet of electric carts (*in process*). A fleet of electric carts is currently used for transportation in and around large County facilities.
- Replace all conventional fueled vehicles with hybrids, electric vehicles, and other viable alternative fuel vehicles³⁴ by 2020 (*in process*). Every year, 1/6th of the sedan fleet is replaced.
- Participate in a plug-in hybrid project with the SCAQMD (*proposed*).
- Install global positioning systems (GPS) in all new vehicles (with some exceptions) to monitor mpg, idle time, and emission status (*proposed*).
- Develop a policy to reduce excessive idling (*proposed*).

County Fire Department (County Fire). County Fire is currently responsible for approximately 652 vehicles, of which 461 are passenger/light duty vehicles. There are currently no existing GHG reduction measures for the Fire Department.

County Public Works/Flood Control (Flood Control District). The Flood Control district is responsible for 234 vehicles, of which 108 are passenger/light duty-vehicles. County Public Works/Flood Control District measures include the use more CNG and liquefied petroleum gas (LPG) fuels in place of diesel and gasoline (*proposed*).

³⁴ Compressed natural gas (CNG), liquefied petroleum gas (LPG), and propane are currently not used and are unsuitable for the Fleet Management Department.

County Sheriff's Department (Sheriff's Department). The Sheriff's Department is responsible for approximately 1,277 vehicles, of which 1,136 are passenger/light duty vehicles. The Sheriff's Department measures include:

- Use more Flex-Fuel vehicles (*in process*) (currently all 2007 and 2008 Ford Crown Victoria's and 2008 Chevrolet Tahoe 4x4's are Flex Fuel vehicles).
- Downsize V-8 and V-6 vehicles to smaller vehicles equipped with 4 cylinder engines, where feasible (*proposed*).
- Use alternative-fuel vehicles to replace older, less fuel efficient vehicles (*proposed*).
- Implement a new fleet management program to assist in "right sizing" the fleet: comparing the fleet to number of employees (*proposed*).

Solid Waste (Waste Haulers). The waste hauler fleet is currently contracted out to multiple waste collection companies. There are no existing GHG reduction measures for these vehicles.

R2F1-INT: Implement Accelerated Vehicle Fleet Turnover for Passenger/Light-duty Vehicles

This measure requires the County to implement an accelerated fleet turnover rate for the County's passenger/light-duty vehicles fleet which will reduce GHG emissions faster than implementation of Pavley I and II measures.

The following information was provided by the County and used to estimate GHG emission reductions associated with these requirements:

- Motor pool vehicles are replaced about every six (6) years. Fire Department vehicles are replaced about every ten (10) years. Consequently, by 2020, the entire motor pool fleet will be composed of model year vehicles 2015 or newer, and Fire Department vehicles will be 2011 or newer.
- The County provided an estimated model year for each vehicle in the Motor Pool and fire department. This information was used to determine an average fuel economy for passenger/light-duty vehicles in these two fleets. As a result, the average passenger/light-duty fuel economy of the motor pool and County Fire Department fleets in 2020 will be approximately 39.9 mpg.

The following assumptions were used to estimate GHG emission reductions associated with these requirements:

- A correction factor was used to account for life-cycle emissions associated with the manufacture of cars that would replace the additional turned-over vehicles as a result of this measure. According to a Berkeley Institute of Transportation Studies report on life-cycle vehicle emissions, life-cycle GHG emissions for the manufacture of cars are eight (8)–15 percent larger than vehicle operation for autos (sedans, SUVs, and pickups).³⁵ Since the CARB considers life-cycle GHG emissions for calculation of emission reductions, this factor was assumed to be included in CARB's projected emission reductions in the R1 measures listed above. All vehicles in the 2020 unmitigated scenario meet the 2002 model year California fleet wide fuel economy of 25.1 mpg.³⁶

³⁵ Chester 2008.

³⁶ California Air Resources Board 2008f.

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- All new vehicles meet the Pavley standard for the model year of the new vehicle. The model year for all new vehicles is equal to the year those vehicles were replaced (i.e., vehicles replaced in 2016 will be replaced with model year 2016 vehicles meeting the 2016 Pavley standard).³⁷
 - The average fleet fuel economy for model year 2020 vehicles is 42.5 mpg.³⁸
 - The ratios of the 2002 fleet wide fuel economy to the 2020 fleet wide fuel economies were multiplied by 2020 unmitigated emissions to determine GHG reductions from this measure.

Implementation of Pavley I and II measures in the R1 classification lead to an emission reduction of 6,098 MTCO_{2e} (described in R1).

This accelerated vehicle turnover measure results in an additional reduction of 4,534 MTCO_{2e} by 2020, broken out by measures R2F1a-INT and R2F1b-INT below. The associated percent emission reductions due to this measure are approximately 15 percent of 2020 unmitigated emissions for passenger/light-duty vehicles, or 11 percent of total 2020 unmitigated fleet emissions.

R2F1a-INT: Current County Turnover Rate

R2F1-INT, subpart (a) requires continuation of the County's current vehicle turnover rate, resulting in a turn over all of the Passenger/Light-Duty Vehicles in the Motor Pool and 50 percent of the Fire Department Fleets by 2020. It was assumed that there would be R1 unmitigated turnover for the remaining fleets (Public Works, Sheriff, Special districts, Waste Haulers, and Non Motor Pool). All replaced vehicles should be the most efficient vehicles available where practicable to achieve the maximum GHG reductions.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Measures R1F1-INT and R1F2-INT have been implemented.

The reductions attributed to the County's current fleet turnover policy are 1,831 MTCO_{2e} for 2020, or 4 percent of 2020 unmitigated passenger/light-duty vehicle emissions.

R2F1b-INT: Replacement of All Passenger/Light-Duty Vehicles by 2020

R2F1, subpart (b) requires County replacement of 100 percent of its passenger/light-duty vehicles by the year 2020. All replaced vehicles should be the most efficient vehicles available where practicable to achieve the maximum GHG reductions. This measure will result in GHG reductions beyond the County's current turnover as described in measure R2F1a-INT.

Implementation of this measure will result in the County retiring vehicles earlier than planned. These vehicles may be transferred or sold to users who will continue to operate the vehicles, resulting in additional GHG emissions. The destination and future use of retired vehicles is unknown, and it is anticipated that whoever acquires these vehicles is likely replacing an older, less fuel efficient vehicle. In addition, buyers would likely be buying and operating vehicles regardless of the County's fleet turnover measure. Consequently, GHG emissions from third-party operation of retired County vehicles were not quantified.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Measures R1F1-INT and R1F2-INT have been implemented.

³⁷ California Air Resources Board 2008f.

³⁸ California Air Resources Board 2008f.

Additional GHG reductions attributed to this measure are 2,600 MTCO₂e for 2020, or 8.4 percent of 2020 unmitigated passenger/light-duty vehicle emissions, which equals approximately 6 percent of the 2020 unmitigated fleet emissions.

This measure will replace approximately 1,451 passenger/light-duty vehicles by 2020. Due to fleet growth, there will be approximately 95 new vehicles by 2020. According to the CARB, 1.3 million vehicles will be replaced annually. By meeting the Pavley I or II regulations, this will save California approximately \$11,058 million dollars by 2020.³⁹ Although the initial cost of the vehicles is higher, the savings in fuel outweigh the capital costs. Consequently, it is likely that this measure will result in cost savings for the County.

R2F2-INT: Replace All Medium- and Heavy-Duty Vehicles by 2020

This measure requires that the County replace its medium-and heavy-duty vehicle fleet (excluding County Fire vehicles) with new vehicles by 2020. GHG reductions were calculated for implementation of R1F14-INT and R1F13-INT (SCAQMD Fleet Rules 1191 and 1196) for these replaced vehicles.

These reductions depend upon the assumptions discussed in Section 2 for R1F5:

- 100 percent of vehicles subject to Rules 1191 and 1196 will be retired by 2020.
- The GHG standards for new medium-duty vehicles acquired by the County are consistent with Pavley I and II regulations. Even though the Pavley regulations apply to passenger cars and light-duty trucks, the SCAQMD requirements are sufficiently stringent so as to be considered equivalent standards for medium-duty vehicles.
- All new heavy-duty vehicles will use CNG.
- CNG vehicles emit 18.3 percent less GHG emissions than the same vehicles running on LCFS-compliant diesel fuel. A total of 35.3 percent of the total heavy-duty vehicles in the County's fleet are subject to this rule (94 vehicles excluding those in the fire department).
- Measures R1F11-INT and R1F12-INT have been implemented.

Total reductions from this measure are 36 MTCO₂e for 2020, or 0.1 percent of total 2020 unmitigated fleet emissions.

This measure will replace approximately 17 heavy-duty diesel vehicles with CNG vehicles by 2020. According to the USEPA, liquefied natural gas (LNG) and CNG heavy-duty trucks can cost an additional \$30,000 to \$50,000, or ten (10)–20 percent more than comparable diesel trucks/buses, but CNG costs less per gallon than diesel fuel.⁴⁰ According to a study by TIAX, post 2010, natural gas refuse haulers, transit buses, and short-haul trucks will have lower life-cycle costs to comparable diesel vehicles when oil prices are greater than \$31 per barrel (in 2005 dollars).⁴¹ Consequently, it is likely that this measure will not increase costs for the County.

R3 Fleet/Fuels Measures

This section describes R3 measures for Fleet/Fuel that were not quantified or relied upon to achieve the County's 2020 reduction target. These measures are either facilitative in nature or there are methodological issues that prevent their quantification.

³⁹ California Air Resources Board 2008b.

⁴⁰ Environmental Protection Agency 2002a, 2002b; UNEP 2007.

⁴¹ TIAX 2005.

R3F1-INT: Implement Accelerated Vehicle Fleet Turnover for “Other” Vehicles

In addition to retiring all passenger/light-duty, medium-duty, and heavy-duty vehicles by 2020 as described in measures R2F1-INT and R2F2-INT, the County will replace vehicles classified as “other” when feasible and appropriate . Other vehicles include off-road vehicles, construction equipment, marine vehicles, and stationary engines (i.e., generators). These vehicles could be replaced by those with cleaner-burning diesel engines or alternative fueled engines.

Because this measure is defined as where feasible and appropriate (and thus the exact amount of turnover cannot be estimated with accuracy), this measure was not quantified or relied upon to meet the reduction target.

R3F2-INT: Use Hybrid/ULEV Vehicles

The County will replace retired vehicles with hybrid electric vehicles and/or ULEV that are 50 percent cleaner than average new model cars, when feasible and appropriate.

Because this measure is defined as where feasible and appropriate (and thus the exact amount of turnover cannot be estimated with accuracy), this measure was not quantified or relied upon to meet the reduction target.

R3F3-INT: Implement Early Tire Inflation Program

This measure involves the County’s implementation of an Early Tire Inflation Program. Per CARB’s Tire Inflation Program, the strategy involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. Specifically, the strategy seeks to ensure that tire pressure in older vehicles is monitored by requiring that tires be checked and inflated at regular service intervals. One potential approach would be to require all vehicle service facilities to check and properly inflate tires. It is also anticipated that signage at fueling stations clearly indicate the availability of compressed air at no charge. In addition, the purchase of low rolling resistance tires can help improve fuel efficiency.⁴²

This measure facilitates local implementation of state measure R1F4-INT. To avoid double-counting, no additional reductions were quantified for this measure.

R3F4-INT: Implement Anti-Idling Enforcement

Per CARB’s Anti-Idling Enforcement, the strategy guarantees emission reductions as claimed by increasing compliance with anti-idling rules, thereby reducing the amount of fuel burned through unnecessary idling. Measures may include enhanced field enforcement of anti-idling regulations, increased penalties for violations of anti-idling regulations, and restriction on registrations of heavy-duty diesel vehicles with uncorrected idling violations. Reducing idle time saves fuel, engine wear, and money. As an additional benefit, enforcement of anti-idling rules can reduce noise pollution.⁴³

The County’s anti-idling Ordinance prohibits diesel-fueled vehicles and off-road equipment from idling for periods in excess of five minutes, the County will implement additional measures for its internal operations such as the following measures, (with certain exemptions, such as emergency situations):

- Place all-weather idle-free stickers on both inside and outside of every County vehicle.

⁴² California Air Resources Board 2007b, 2008e.

⁴³ California Air Resources Board 2007b, 2008e.

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- Place signs and messages in highly visible areas detailing the anti-idling policy.
 - Idle times beyond three (3) minutes are prohibited.
 - Install on-board computers to track idling time and fuel consumption.
 - Leave personal voice-mail messages and send emails notifying employees of the idle-free campaign.
 - Follow up with each driver to give feedback regarding idle statistics from the on-board computers.
 - Offer an incentive program rewarding drivers who reduce fuel consumption by limiting idling.

Data did not exist to identify the specific amount of idling in 2007 associated with County vehicles. As such, reductions possible with this measure were not quantified.

R3F5-INT: Implement Smart Driving Policy

This measure involves the County's implementation of a Smart Driving policy incorporating measures such as the following, with certain exemptions (such as emergency situations): Potential savings in fuel economy reported by the USEPA are presented in parentheses.⁴⁴

- Change gears between 2,000 and 2,500 rotations per minute (rpm) and use the highest gear possible.
- Reduce average speed/observe speed limit; driving at 70 mph uses around 15 percent more fuel than at 50 mph (seven [7]–23 percent).
- Avoid unnecessary acceleration, braking, and aggressive driving (five [5]—33 percent).
- Install mpg computers in cars to alert drivers.
- Use auxiliary equipment (AC, heater) selectively (AC use can reduce mileage by up to 20 percent).
- Switch off the engine whenever it is safe to do so.
- Remove unnecessary cargo from the car to reduce weight (one [1]–two [2] percent per 100 lbs).
- Reduce aerodynamic drag whenever possible (close windows or remove roof racks).
- Use cruise control wherever possible when available.

Data did not exist to quantify driving parameters for County vehicles in 2007. As such, reductions possible with this measure were not quantified.

R3F6-INT: Implement Vehicle Maintenance Program

This measure involves implementation of a County Maintenance program incorporating the following practices. Potential savings in fuel economy reported by the USEPA are presented in parentheses.⁴⁵

- Use recommended motor oil (one [1]–two [2] percent).

⁴⁴ Environmental Protection Agency 2008b.

⁴⁵ USEPA 2008b.

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- Frequent tune-ups (four [4] percent per tune-up).
 - Replace air filters (ten [10] percent for replacing a clogged filter).
 - Maintain proper tire pressure (three [3] percent).
 - Maintain Air Conditioning system.

The EPA estimates are broad overall averages. Estimating reductions from this measure would require quantification of the specific maintenance profiles of the existing fleet and data was not available to support such an analysis. As such, reductions for this measure were not quantified.

R3F7-INT: Senate Bill 375, Statutes of 2008

SB 375 aims to coordinate land use planning, regional transportation planning, and funding priorities in order to help California meet the GHG reduction goals established in AB32. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations (MPOs), to incorporate a Sustainable Communities Strategy (SCS) in their regional transportation plans that will achieve GHG emission reduction targets set by CARB. SB 375 includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development. The Southern California Association of Governments (SCAG) has initiated early planning toward development of a SCS to promote regional reduction of VMT. As discussed in Appendix A regarding the External Reduction Plan, San Bernardino County will participate with other cities in the County, and with SANBAG and SCAG in the development of the SCS.

This plan may result in additional VMT reductions associated with County operations, but it is premature at this time to quantify the potential benefits until the SCS is further developed and analyzed by SCAG.

R3F8-INT: California's Low-Emission Vehicle (LEV) Regulations

Following a November 5, 1998, hearing, CARB amended California's Low-Emission Vehicle (LEV) regulations. The new amendments, known as LEV II, will advance the state's clean air goals through improved emission reduction standards for automobiles. LEV II regulations, running from 2004 through 2010, represent continuing progress in emission reductions. As the state's passenger vehicle fleet continues to grow and more SUVs and pickup trucks are used as passenger cars rather than work vehicles, the new, more stringent LEV II standards are necessary for California to meet federally-mandated clean air goals outlined in the 1994 State Implementation Plan (SIP).⁴⁶ LEV regulations have the potential to reduce GHG emissions as well as criteria pollutants, since meeting emission reduction standards will likely include the use of alternative fuels. (Note: This measure is a State, rather than a County action measure.)

In combination with the R1 and R2 measures described above, it is difficult to identify the additional marginal benefit of the LEV regulations above the rest of the reduction plan. As such, reductions possible with this measure were not quantified to avoid double-counting.

R3F9-INT: Zero Emission Vehicle (ZEV) Program

The goal of the CARB's Zero Emission Vehicle (ZEV) program is to evolve the California passenger car fleet into a fleet where vehicles have no tailpipe emissions. The ZEV program continues to push the development of clean vehicles and supports the vision needed to meet California's longer-term environmental goals. The original ZEV program required that ten

⁴⁶ California Air Resources Board 2008h, 2008i.

(10) percent of new vehicle sales by large manufacturers have zero emissions, starting with 1998 models. The CARB modified the program in 1998 and 2001 to allow up to 60 percent of the requirement to be met with vehicles having extremely low emissions and specific attributes. In 2009 up to 85 percent of the requirements may be met with low emissions and specific attributes vehicles.⁴⁷ ZEV regulations have the potential to reduce GHG emissions as well as criteria pollutants, since meeting emission reduction standards will likely include the use of alternative fuels. (Note: This measure is a State rather than a County action measure.)

In combination with the R1 and R2 measures described above, it is difficult to identify the additional marginal benefit of the ZEV regulations above the rest of the reduction plan. As such, reductions possible with this measure were not quantified to avoid double-counting.

R3F10-INT: Fleet and Equipment Management and Monitoring.

The County will implement the following fleet and equipment management programs, where feasible and appropriate:

- A fleet management program to assist in “rightsizing” the fleet; comparing the fleet to the number of employees.
- Global Positioning Systems (GPS) installation in all new vehicles (with some exceptions) to monitor mpg, idling time, and emission status.

While this measure will help to develop the data needed to support continuing improvement in fleet efficiency, the measure itself would not result in specific emissions reductions and thus no quantification can be provided.

⁴⁷ California Air Resources Board 2007d, 2008j.

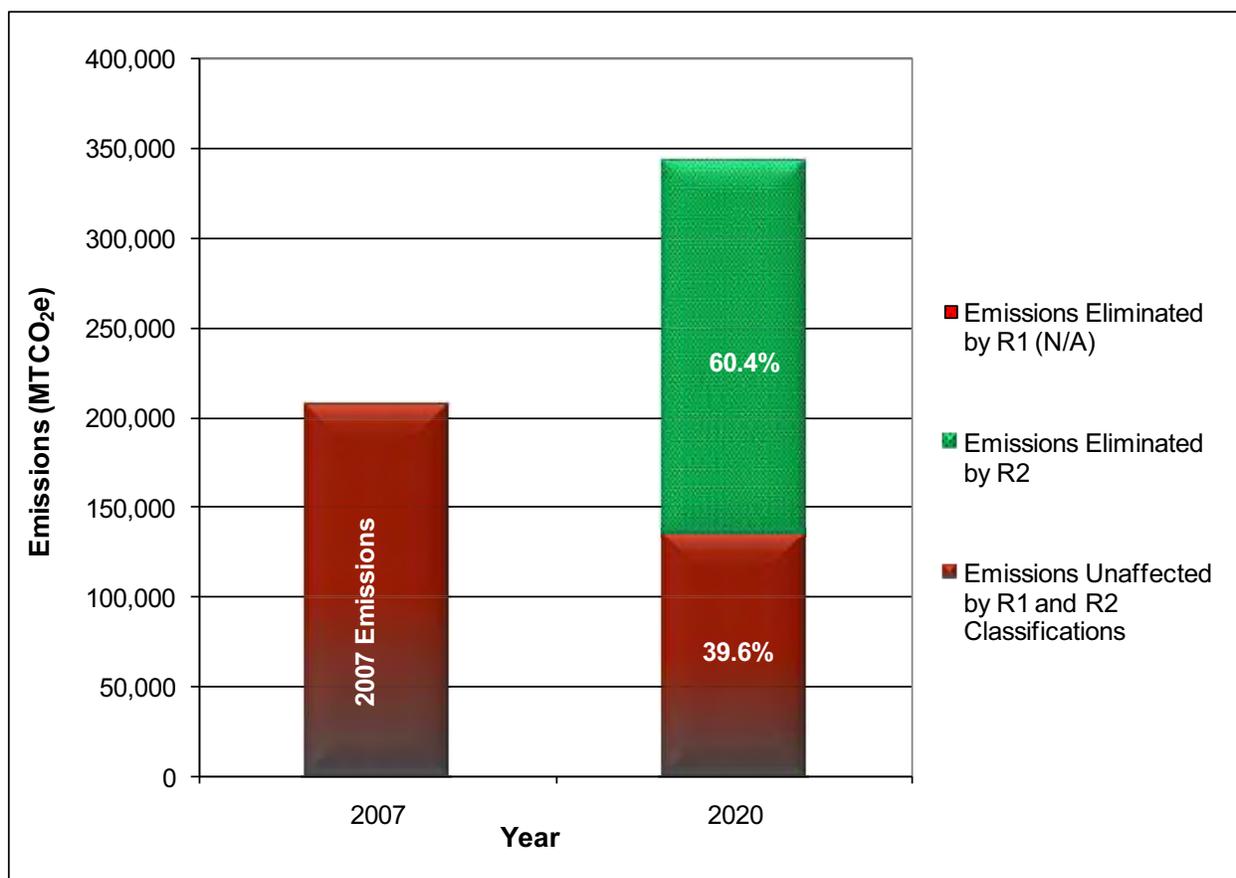
Solid Waste/Landfills

This section describes the methodology used to calculate GHG emission reductions for the *existing and proposed* state, regional or County solid waste measures that will result in future GHG reductions. The total estimated GHG reductions from the reduction measures included in Reduction Classifications R1 and R2 are presented below in **Table B-17** and amount to 206,959 MTCO_{2e}, a 60 percent reduction in total 2020 unmitigated solid waste emissions.

Table B-17. Internal GHG Emission Reductions from Waste Measures

Reduction Classification and Reduction Measures	GHG Reductions (MTCO _{2e})	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state and regional waste management measures that do not require County action		
NA		
R2: Existing and new measures that require County action		
R2W1-INT: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	97,059	28.3
R2W2-INT: Barstow Methane Recovery	37,935 ^a	11.1
R2W3-INT: Landers Methane Recovery	8,471 ^b	2.5
R2W4-INT: Comprehensive Disposal Site Diversion Program	26,390	7.7
R2W5-INT: C&D Recycling Program	295	0.1
R2W6-INT: County Diversion Programs—75 Percent Goal ^c	4,118	1.2
R2W7-INT: City Diversion Programs—75 Percent Goal ^c	32,692	9.5
Total	206,959	60.4
R3: Existing and new waste measures—reductions not quantified or relied upon to achieve reduction goal		
R3W1-INT: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP		
R3W2-INT: Financing Mechanisms and Opportunities		
R3W3-INT: Waste Education Program		
R3W4-INT: Additional Landfill Methane Controls		
R3W5-INT: Landfill Gas to Energy Projects		
Notes:		
Reductions for these measures solely represent avoided methane emissions at landfills and assume that all waste reduction measures are implemented in combination.		
^a Attributed to waste in place methane reductions from Barstow as well as new waste planned for Barstow.		
^b Attributed only to existing waste in place at Landers.		
^c Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of County-generated waste by 2020.		
^d Assumes linear growth in diversion beginning in 2009 to reach 75 percent diversion of City-generated waste by 2020.		

Figure B-10. Internal GHG Emission Reductions from Solid Waste Measures



With the implementation of the emission reduction measures included in this Plan, the County will reduce landfill emissions by 60 percent (all from R2 measures) from 2020 unmitigated projections. Reduced emissions in 2020 will be approximately 34 percent lower than 2007 emissions.

R1 Waste Measures

The CARB AB32 Scoping Plan recommends three measures for reducing emissions from Municipal Solid Waste at the State level, including: 1) landfill methane control; 2) increase the efficiency of landfill methane capture; and 3) high recycling/zero waste. CARB is in the process of developing a discrete early action program for methane recovery (1), likely to be adopted in early 2010. This measure is expected to result in a 1.0 MMTCO_{2e} reduction by 2020. Other measures proposed by CARB include increasing efficiency of landfill methane capture (2) and instituting high recycling/zero waste policies (3). Potential reductions associated with these measures are still to be determined. CARB estimates a preliminary one-time cost for adoption of these measures to be approximately \$70 per ton of CO₂ reduced. Capital cost is estimated to be approximately \$3,440,000 and annual operation cost is estimated to be approximately \$706,400 per landfill. Total industry cost estimates will be evaluated further in the staff report for the landfill methane control measure⁴⁸.

⁴⁸ Air Resources Board 2008b, 2009b

The County-owned landfills may already meet the majority of the requirements of the proposed landfill regulation. Large landfills such as Landers and Barstow will likely require monitoring and annual review to ensure the proper operation of their methane controls⁴⁹. All other landfills evaluated in the External Inventory also appear to be either meeting the requirements of the landfill methane control measure or are not subject to them, and it is anticipated that this measures will not result in any additional reductions for these landfills. These conclusions should be reassessed after finalization of the proposed landfill regulation.

The high recycling/zero waste measure is expected to result in GHG emissions reductions by reducing the substantial energy use associated with the acquisition of raw materials in the manufacturing stage of a product's life-cycle. As virgin raw materials are replaced with recyclables, a large reduction in energy consumption should be realized. Implementing programs with a systems approach that focus on consumer demand, manufacturing, and movement of products will result in the reduction of GHG emissions and other co-benefits. The potential 2020 GHG emission reductions attributed to this measure are estimated to be nine MMTCO₂e⁵⁰. According to the CARB, some of the GHG "lifecycle" reductions may occur outside of California, making accounting more difficult, and additional research to quantify these emission reductions is needed⁵¹. Consequently, these reductions are not counted toward the AB 32 goal and were not counted as R1 reductions for the County.

All future emission reductions do not take into account the GHGs associated with recycling or composting the materials that have been diverted from the landfill.

R2 Waste Measures

This section describes the methodology used to calculate GHG emission reductions for those measures that have been implemented or will be implemented; resulting in GHG reductions for the municipal solid waste management sector and require County action. Measures R2W1-INT and R2W2-INT below are based on reductions achieved from applying methane recovery technology to specific landfills. Only active landfills with a capacity of greater than three (3) million cubic yards were evaluated because methane recovery at smaller landfills is not likely to be cost-effective. Emission reductions from recovery at the smaller landfills are likely less than five (5) percent of the reductions from recovery at the larger landfills. Measures R2W4-INT to R2W7-INT are associated with the displacement of waste prior to landfilling. For these measures, only GHG reductions attributed to avoided methane emissions at the landfill site (rather than emissions associated with all lifecycle stages) are considered for reduction potential in the County's inventory because the emissions occurring at the landfills are under the County's direct control.

Measures R2W4-INT to R2W7-INT are associated with the displacement of waste prior to landfilling. For these measures, only GHG reductions attributed to avoided methane emissions from waste in the landfill are considered for reduction potential in the County's inventory because these emissions are completely under the County's control. However, the total lifecycle emissions associated with these measures were also evaluated with the USEPA Waste Reduction Model (WARM) to demonstrate the global reduction potential of these measures. WARM is used to calculate GHG emissions of baseline and alternative waste management practices,

⁴⁹ Information received from the County Solid Waste Department

⁵⁰ Air Resources Board 2007.

⁵¹ Air Resources Board 2008a.

including: source reduction, recycling, combustion, composting, and landfilling. The WARM tool's lifecycle approach reflects emissions and avoided emissions, both upstream and downstream from the point of use (i.e., when and where the material/product is used). Therefore, the emission factors provided in this tool provide an accounting of the net benefit of these actions to the environment. Emissions factors are based on national averages for each process⁵².

Each measure below accounts for emission reductions already attributed to R1 measures for this sector, and any applicable R2 measures.

R2W1-INT: Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills

Mid-Valley, Milliken, and Colton Landfills have the most waste-in-place (WIP) of any landfills under County control. In addition, these three landfills are currently accepting most of the new waste generated by incorporated cities in the County. Consequently, the WIP in these landfills represent the largest sources of methane from the solid waste sector. In 2007, these landfills accepted over one million tons of waste, representing 67 percent of all new waste landfilled in San Bernardino County⁵³. Because these landfills are so important to the County's solid waste system, increasing methane recovery at these sites will have the greatest effect on reducing methane emissions from this sector.

This measure requires the County to achieve a methane recovery rate of 95 percent at Mid-Valley and 85 percent at Colton and Milliken Landfills. These landfills currently have methane recovery systems in place⁵⁴. The USEPA recommends using a 75 percent capture rate as a default value for methane recovery systems where the precise capture rate is unknown⁵⁵. Increasing the methane recovery rate will result in methane emission reductions from both WIP and newly landfilled waste. Multiple studies were reviewed to determine the achievable methane recovery rate for current advanced methane control technology for landfills. A 1999 study from the Institute for Environmental Management demonstrated that methane capture effectiveness approached 100 percent at a Yolo County landfill project through the use of a surface membrane cover over porous gas recovery layers operated at a slight vacuum⁵⁶. Synthetic/geomembrane final covers have been shown to be very efficient at reducing methane emissions. A 2008 study by the California Integrated Waste Management Board found that they have a high potential for GHG emission reductions⁵⁷, and a 2006 study demonstrated 90 percent recovery⁵⁸.

A cost and technology feasibility study must be performed to determine the methane capture and destruction rates for any methane controls installed at these landfills. This study is necessary to determine the feasibility of installing methane control technology, and the maximum possible methane recovery rate achievable at each landfill. As discussed above, the methane capture rates used in this analysis reflect relevant studies of similar landfill sites, accepted methodology, and current landfill data.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The methane recovery systems currently in place are assumed to capture 75 percent of

⁵² Environmental Protection Agency 2008b.

⁵³ California Integrated Waste Management Board 2008.

⁵⁴ Environmental Protection Agency 2008c.

⁵⁵ Environmental Protection Agency 1998.

⁵⁶ Augenstein 1999.

⁵⁷ California Integrated Waste Management Board 2008b.

⁵⁸ Spokas et al. 2006; Australian Greenhouse Office 2007.

emitted methane from all waste currently in place, and all new waste disposed of at Mid-Valley, Milliken, and Colton Landfills by 2020⁵⁹.

- The recommended methane recovery systems included in this analysis are assumed to capture 95 percent of emitted methane from all WIP and all new waste disposed of at Mid-Valley, and 85 percent of emitted methane from all WIP and all new waste disposed of at Milliken and Colton Landfills by 2020.

The reductions are estimated at 49,972 MTCO₂e in 2020 from waste already in place at the landfills. The emission reductions associated with new waste added to the landfills result in 47,087 MTCO₂e by 2020. This measure will result in a 28 percent reduction from 2020 unmitigated landfill emissions.

R2W2-INT: Install Methane Recovery System at Barstow

Due to the safety issues associated with methane, the California Code of Regulations (CCR), Title 27, Chapter 3, Subchapter 4, Article 6, contains requirements that owners and operators of landfills must monitor and control landfill gas (LFG) (mostly methane) and prevent it from accumulating in enclosed structures and/or migrating offsite. To meet the requirements of Title 27, the County installed a methane recovery system at Barstow Landfill in 2010.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The methane recovery system is assumed to capture 75 percent of emitted methane from all waste currently in place, and all new waste entering Barstow Landfill by 2020⁶⁰.
- An overall increase of six (6) percent (i.e., 90 to 96 percent) for the delivery of waste to sites with a methane recovery system in place will occur between 2007 and 2020.
- Measure R2W1 has been implemented.

In 2020, the reductions associated with the Barstow site are estimated at 10,970 MTCO₂e from waste already in place at the landfill. The emission reductions associated with new waste result in 37,935 MTCO₂e by 2020. This measure will result in a 11 percent reduction from 2020 unmitigated landfill emissions.

R2W3-INT: Install Methane Recovery System at Landers

The County can further reduce emissions by installing a methane recovery system at Landers. Because Landers is scheduled to close by 2013, the waste reduction calculation for this facility is based only on waste currently in place and that a negligible amount of new waste, in relation to the waste in place, would be disposed of at Landers.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The methane recovery system is assumed to capture 75 percent of emitted methane from all waste currently in place⁶¹.
- In 2020, 96 percent of waste will be disposed of in landfills with methane recovery systems.

⁵⁹ Environmental Protection Agency 1998

⁶⁰ Environmental Protection Agency 1998

⁶¹ Environmental Protection Agency 1998.

In the year 2020, the reductions associated with the Landers site are estimated at 8,471 MTCO_{2e}. This measure will result in a 2 percent reduction from 2020 unmitigated landfill emissions.

A cost and technology feasibility study must be performed to determine the methane capture and destruction rates for any methane controls installed at this landfill. This study is necessary to determine the feasibility of installing methane control technology, and the maximum possible methane recovery rate achievable at the landfill. As discussed above, the methane capture rates used in this analysis reflect relevant studies of similar landfill sites, accepted methodology, and current landfill data.

R2W4-INT: Comprehensive Disposal Site Diversion Program

The County's Comprehensive Disposal Site Diversion Program (CSDSP) recovers "post-diversion" waste for recycling at the landfill. Post-diversion is defined as the waste sent to landfill, after accounting for the County's municipal recycling and composting programs, which are accounted for in the 2020 total waste estimates. This program has been quite successful at increasing waste diversion from landfilling to recycling since its inception in 2006; the County successfully diverted 112,846 tons of waste in fiscal year 2007-2008 fiscal year. By 2020 the CSDSP program will divert an estimated 11 percent of waste arriving at County landfills each year, increasing the current per capita diversion rate from 49 percent to approximately 54.5 percent.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Projected diversion rates grow at a rate of 1.02 percent annually.
- In 2020, 100 percent of new waste will be disposed of in landfills with methane recovery systems (after Measures R2W1-INT through R2W3-INT have been implemented).
- Measures R2W1-INT through R2W3-INT have been implemented.

As described above, only emission reductions directly attributed to waste diversion from landfills are considered for reduction potential in the County's internal operations inventory. These emission reductions for the County's CSDSP are equivalent to 13,137 MTCO_{2e} in 2020. However, after implementation of measures R2W1 through R2W3, 100 percent of new waste will be disposed of in landfills with methane recovery systems. This results in additional reductions of 13,253 MTCO_{2e} in 2020. This measure will result in a 8 percent reduction from 2020 unmitigated landfill emissions.

For informational purposes, WARM was used to evaluate total lifecycle emissions associated with this measure. WARM was used to calculate GHG emissions of baseline and alternative waste management practices associated with the CSDSP, including recycling and composting, with San Bernardino County-specific waste disposal totals and appropriate assumptions regarding collection efficiency. Waste disposal categories for San Bernardino County provided by the California Integrated Waste Management Board (CIWMB) in 1999 (CIWMB 1999). The lifecycle reductions associated with the CSDSP program are estimated at 452,508 MTCO_{2e} for the year 2020. Because many of the processes associated with the waste emissions are not in San Bernardino County and/or are not under County control, the full lifecycle emissions reductions were not counted in the CSDSP reduction measure.

R2W5-INT: Construction and Demolition Debris Diversion

Under AB2176, § 42911, a local agency shall not issue a building permit to a development project unless the development project provides adequate areas for collecting and loading

recyclable materials and ensures a minimum diversion of 50 percent of construction and building materials and demolition debris from landfills. In San Bernardino County, existing construction and demolition (C&D) is currently permitted on a case by case basis. Building permits are issued conditionally based on the C&D recycling and waste management plan. Under this plan, a minimum estimate of 50 percent diversion is required as is a detailed diversion plan with the waste hauler identified and a plan verification before every permit is issued. The County could further reduce emissions from construction and demolition waste by increasing the diversion requirements.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Starting in 2009, diversion increases by one (1) percent per year to reach ten (10) percent total diversion in 2020.
- The ten (10) percent C&D diversion target is constant in 2020.
- C&D accounts for approximately 8.5 percent of San Bernardino County's average waste composition⁶².
- On average, the County currently meets the 50 percent requirement for C&D.
- In 2020, 100 percent of waste will be disposed of in landfills with methane recovery systems.
- Measures R2W1 through R2W4 have been implemented.

Diverting an extra ten (10) percent of this C&D waste would result in a reduction of 295 MTCO₂e in 2020. This measure will result in a 0.08 percent reduction from 2020 unmitigated landfill emissions.

For reference, lifecycle emissions were calculated with WARM, using the same methodology and assumptions described for prior measures. Reduction of the full lifecycle emissions would result in a reduction of 64,199 MTCO₂e in 2020.

R2W6-INT: County Diversion Program: 75 percent Diversion Goal for Unincorporated County-Generated Waste

This measure involves the County's commitment to strengthen its Diversion Program to reach a goal of 75 percent of waste diverted to recycling programs by 2020 through the implementation of one or more of the following measures:

- Expand current waste reduction and recycling plans, including outreach and education programs.
- Encourage businesses in the County to adopt a voluntary procurement standard prioritizing products that have less packaging or are re-usable, recyclable, or compostable; support policies at the State level that provide incentives for efficient product design and for reduced product and packaging waste.
- Provide waste audits.
- Make recycling and composting mandatory at public events.
- For new development, require the use of salvaged and recycled-content materials and other materials that have low production energy costs for building materials, hard surfaces, and

⁶² California Integrated Waste Management Board 2007.

non-plant landscaping. Require sourcing of construction materials locally, as feasible. Encourage the use of cement substitutes and recycled building materials for new construction.

- Research, evaluate, and report on best practices, innovations, trends, and developments in waste reduction practices, as relevant to GHG emissions reduction.

It is estimated that the County could achieve a 75 percent diversion rate by 2020, which would be an increase of approximately 25 percent from diversion measures currently underway (i.e., measures R2W3-INT and R2W4-INT). The County is faced with unique challenges regarding waste diversion targets due to the rural nature of its populated areas and its socioeconomic conditions. Many of the small population centers are spread over a large geographical area in the County. In addition, illegal dumping at landfills has been a problem in the past, and it is anticipated that increasing tipping fees to help achieve the waste diversion goal could also increase the rate of illegal dumping. Given these challenges, the County will need to further assess the feasibility of achieving the 75 percent diversion goal by 2020.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Starting in 2009, diversion increases by two (2) percent per year to reach 75 percent total diversion in 2020.
- In 2020, 100 percent of new waste will be disposed of in landfills with methane recovery systems
- Measures R2W1-INT through R2W5-INT have been implemented.
- An additional cumulative 25 percent increase in diversion to achieve a 2020 total diversion goal of 75 percent would result in an additional reduction of 4,118 MTCO₂e in 2020. This measure will result in a 1 percent reduction from 2020 unmitigated landfill emissions.
- These estimates do not include reduction in life cycle emissions. For reference, lifecycle emissions were calculated with WARM, using the same methodology and assumptions described for prior measures. Reduction of the full lifecycle emissions would result in a total reduction of 313,514 MTCO₂e in 2020.

R2W7-INT: City Diversion Program: 75 percent Diversion Goal for Incorporated County-Generated Waste

The incorporated areas of the County currently divert approximately 55 percent of generated waste. This measure would result in increasing that diversion percentage to 75 percent. The County will continue to work with the various cities in the County to implement programs to reduce waste generation and increase waste diversion. Programs that can be implemented to achieve this goal are outlined under measure R2W6.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Starting in 2009, diversion increases by approximately two (2) percent per year to reach 75 percent total diversion in 2020.
- Approximately 94 percent of waste disposed of by the incorporated areas of the County is landfilled within County borders; consequently, 94 percent of emission reductions will

occur inside the County, and six (6) percent will occur outside⁶³.

- The percentage waste disposal at sites with methane capture in the incorporated County is equal to that for the unincorporated County: 100 percent of new waste will be disposed of in landfills with methane capture.
- Measures R2W1-INT through R2W6-INT have been implemented.
- An additional cumulative 20 percent increase in diversion to achieve a 2020 total diversion goal of 75 percent for the incorporated County would result in an additional reduction of 32,692 MTCO₂e in 2020. This measure will result in a 9 percent reduction from 2020 unmitigated landfill emissions.

R3 Waste Measures

The following list of R3 measures includes all additional measures that were not relied upon to demonstrate achievement of the proposed County 2020 emissions target. These measures are either facilitative in nature or there are methodological issues that prevent their quantification at this time.

R3W1-INT: Install Methane Capture Systems at all Landfills with 250,000 or more Tons of WIP

The County will explore the feasibility of installing methane recovery systems at all landfills with 250,000 or more tons of WIP. The County will also explore the feasibility of providing technical support to encourage the installation of methane recovery systems at private landfills within the County. This includes the following County-owned and private landfills:

- Apple Valley (closed/County)
- Big Bear (closed/County)
- Hesperia (closed/County)
- Yucaipa (closed/County)
- Mitsubishi Cement Plant Cushenbury (active/private)

A cost and technology feasibility study must be performed to determine the potential methane capture and destruction rates for any methane controls installed at these landfills. This study is necessary to determine the feasibility of installing methane control technology, and the maximum possible methane recovery rate achievable at each landfill. It is possible that methane capture and destruction at these landfills is not feasible because smaller landfills are typically remote, have no power supply, and produce poor gas. The systems may need to run off of a generator and methane flares would likely require additional gas to ensure flare operation and methane destruction.

The following assumptions were used to calculate emission reductions attributed to this measure:

- Each methane control system has an efficiency of 75 percent.

This measure could result in an additional reduction of 14,995 MTCO₂e in 2020 and a 4 percent reduction from 2020 unmitigated landfill emissions.

⁶³ California Integrated Waste Management Board 1999.

Reductions associated with this measure have not been included in the reduction plan because this measure has not been analyzed for cost-effectiveness. In addition, the County does not have jurisdiction to install a methane recovery system at Mitsubishi Cement Plant Landfill but could provide technical support to this landfill owner.

R3W2-INT: Financing Mechanisms and Opportunities

The County will pursue all appropriate all grant opportunities to help finance the installation of methane recovery systems and controls, the enhancement of waste diversion programs and public education programs focused on waste stream issues.

While grant funding is an essential strategy to funding reductions, it does not in and of itself result in actual reductions. Thus, no quantification of this measure was completed.

R3W3-INT: Waste Education Program

This measure involves providing public education and publicity about commercial and residential recycling, waste reduction, composting, grass cycling, and waste prevention. This measure would educate the local population about waste management and waste reduction options applicable to both residential and commercial settings. Although the County currently offers community education programs designed to assist residents with waste reduction, recycling and reuse activities, this measure would expand the County's current programs.

This measure is not expected to result in additional emission reductions beyond those already claimed in R2W7-INT, because education programs are relied upon to achieve the 75 percent diversion goal.

R3W4-INT: Additional Landfill Methane Controls

The County's Municipal Solid Waste Department is currently in the process of assessing the feasibility of installing additional methane capture systems. The following actions are being considered that could further reduce methane emissions from landfills in the County:

- Use landfill gas extraction system, surface sampling, gas migration probe, and other available to data to get an accurate representation of methane generation at San Bernardino County landfills. This information could be used to accomplish the following:
 - ❑ Develop a GHG emission site priority list.
 - ❑ Develop strategies based on site priorities.
 - ❑ Install additional gas extraction wells as necessary in existing systems.
 - ❑ Pursue low tech solution at remote sites that do not have a power source.
- Pursue further study of the chemical reactions of methane gas attenuation as it migrates through the cover soils at each landfill, and develop low power methods for improving these reactions.
- Work with other agencies that are studying GHG emissions from landfills and develop partnerships where information and approaches are shared.
- Further develop waste disposal alternatives such as recycling, waste-to-energy, aerobic digestion of organic materials, and other actions.

Additional landfill methane controls are still being considered. At present, the specific controls have not been determined. Thus, no quantification of this measure was completed. As additional controls are implemented, the County intends to quantify their effectiveness in future GHG inventories.

R3W5-INT: Landfill Gas to Energy Projects

The County's Municipal Solid Waste Department currently has Landfill Gas to Energy (LFGE) Projects at the Colton, Mid Valley, and Milliken landfills. These projects have the capacity to generate a combined six (6) MW of renewable electricity, and it is estimated that they have produced over 220 MWh of electricity in the first five (5) years of their operation (all three projects came online in 2003). These projects are funded by the California Energy Commission's Renewable Energy Program. The LFGE projects sell their electricity to Southern California Edison (SCE), where it is distributed throughout the County. This electricity is part of SCE's renewable power portfolio and is therefore already incorporated into the indirect emissions associated with electricity consumption included in this inventory. Consequently, emission reductions directly attributed to offsets in non-renewable energy resulting from these projects have not been included in this emission reduction plan. However, methane captured and combusted to produce electricity has been subtracted from the landfill emissions presented in this inventory.

The County will consider pursuing additional LFGE projects at other landfills where the projects are cost-effective and technologically feasible. Through this measure, these projects would increase the renewable electricity available in the County, reduce GHG emissions associated with non-renewable electricity use, and reduce methane emissions that would otherwise be released into the atmosphere.

Additional LFGE efforts are still under consideration. Thus, no quantification of this measure was completed. As additional LFGE efforts are implemented, the County intends to quantify their effectiveness in future GHG inventories.

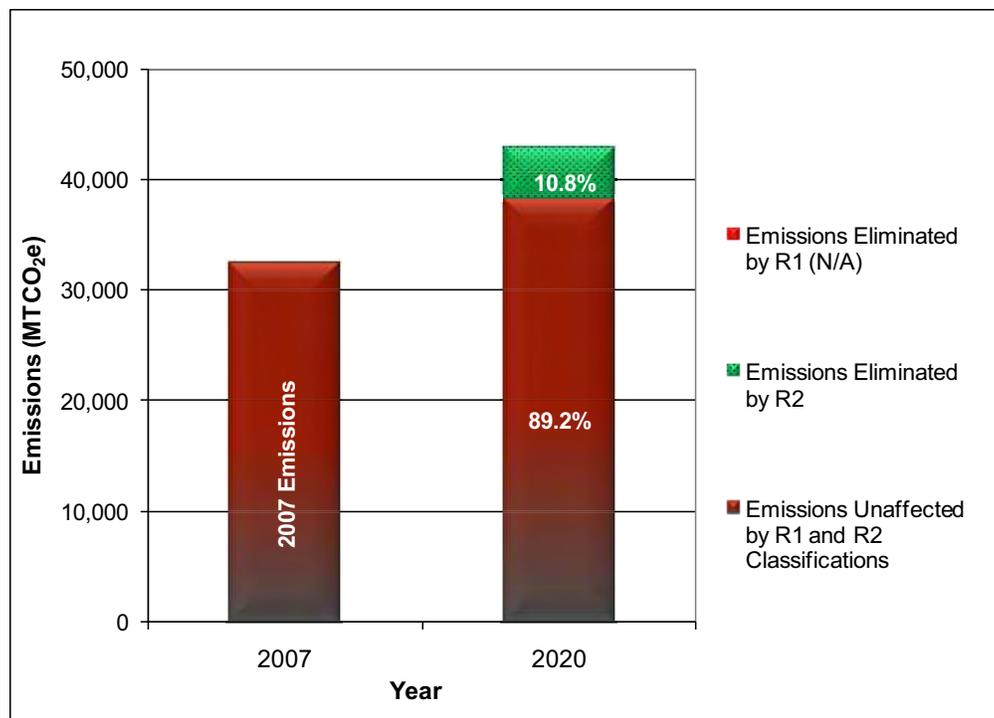
Employee Commute

This section describes the methodology used to calculate GHG emission reductions related to R2 for employee commute for the County. Total reductions from all employee commute measures are shown in **Table B-18**. The total reduction attributable to these measures is 4,651 MTCO₂e, an 11 percent reduction in total 2020 unmitigated employee commute emissions.

Table B-18. Internal GHG Emission Reductions from Employee Commute Measures

Reduction Classification and Reduction Measure	GHG Reductions (MTCO ₂ e)	
	Emission Reduction from 2020 Unmitigated	Percent Reduction from 2020 Unmitigated
R1: Existing and proposed state employee commute measures that do not require County action		
N/A		
R2: Existing and new employee commute measures that require County action		
R2EC1-INT: Expand Vanpool Program	2,201	5.1
R2EC2-INT: Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving	860	2.0
R2EC3-INT: Increase Bicycling and Walking	753	1.8
R2EC4-INT: Increase the Use of Public Transit as an Alternative to Driving	138	0.3
R2EC5-INT: Increase Use of Clean Air Vehicles	699	1.6
Total	4,651	10.8
R3: Existing and new employee commute measures—reductions not quantified or relied upon to achieve reduction goal		
R3EC1-INT: Telecommuting, compressed Work Week		

Figure B-11. Internal GHG Emission Reductions from Employee Commute Measures



With the implementation of the Employee Commute measures included in this Plan, the County will reduce employee commute by 11 percent emissions (all due to R2 measures) from 2020 unmitigated projections. The reduction that will result from R1 measures related to vehicle standards are evaluated and calculated in Appendix A.

R1 Employee Commute Measures

There are currently no R1 measures that were evaluated for employee commute, since potential federal, state, or regional measures relate to vehicle standards and are captured separately in an evaluation of external passenger vehicle emissions.

R2 Employee Commute Measures

This section describes the existing or new County emissions reduction measures that will result in GHG reductions relating to employee commute, which will require County action. The description of each measure is followed by the percent reduction in GHG from the 2020 unmitigated emission inventory. A description of each measure is followed by the resulting GHG reductions.

All quantifiable GHG reduction options available to the County have been included under R2 since each of these reduction opportunities requires County action. Measures R2EC1-INT through R2EC4-INT below are based on reductions achieved through implementation of commuter-based programs involving ridesharing, carpooling, mass transit, and alternative modes of transportation. Assumptions listed below refer to emissions reductions for 2020.

R2EC1-INT: Expand Vanpool Program

This measure requires strengthening and expanding the County's current vanpool programs. In 2007, the County operated over 25 vanpools. According to a study of Los Angeles area employee commute trip reduction programs, the most effective strategy to reduce employee vehicle trips is to offer financial incentives to employees, such as vanpool fare subsidies.⁶⁴ Other ways to expand the vanpool programs include adding additional vanpools, expanding the number of work sites where the vanpools operate, offering greater flexibility in vanpool scheduling (i.e., allowing commuters to vanpool on the week days of their choice or allowing unscheduled use of vanpools), implementing vanpool education and rewards programs, and offering premium quality vanpool service options (such as high-quality vans, workstations, complimentary newspapers, drinks, etc.).⁶⁵

GHG emission reductions associated with this measure are based on a study of 1,110 Los Angeles area employee commute trip reduction programs. Since the majority of these programs are within Los Angeles County, the effectiveness of these measures was adjusted to be applicable to San Bernardino County based on commute statistics for each county.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The effectiveness of this measure is estimated to be 131 percent of that reported for Los Angeles County, due to the higher rate of workers carpooling in San Bernardino County (in 2000, Los Angeles County had an 11 percent carpool/vanpool rate while San Bernardino County had a 14 percent carpool/vanpool rate).⁶⁶

⁶⁴ Cambridge Systematics 1994.

⁶⁵ Victoria Transport Policy Institute 2008.

⁶⁶ U.S. Census Bureau 2007.

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- This measure would result in a 7.1 percent reduction in drive-alone work trips (scaled up from 5.4 percent for Los Angeles).

This measure results in a 5 percent reduction of 2020 unmitigated employee commute emissions.

R2EC2-INT: Increase the Use of Ridesharing as an Alternative to Single Occupancy Driving

This measure requires creating new or strengthening existing rideshare and carpool programs. According to a study of Los Angeles area employee commute trip reduction programs, the most effective strategy to reduce employee vehicle trips is to offer financial incentives to employees.⁶⁷ This measure could be implemented through rideshare incentives such as gas cards, carpool awards, educational seminars, commuter-choice programs, commuter-tax benefits, guaranteed ride-home programs, commuter assistance and outreach, and parking incentives. Other reductions in VMT and commute trips could be obtained through encouragement of telecommuting and compressed work weeks.

GHG emission reductions associated with this measure are based on a study of 1,110 Los Angeles area employee commute trip reduction programs. Since the majority of these programs are within Los Angeles County, the effectiveness of these measures was adjusted to be applicable to San Bernardino County based on commute statistics for each county.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The effectiveness this measure is estimated to be 85 percent of that reported for Los Angeles County, due to the lower rate of workers using alternative modes of transportation in San Bernardino County (in 2000, 23 percent of workers in Los Angeles County took public transit, carpooled, or walked/biked while 20 percent of workers in San Bernardino County did the same).⁶⁸
- This measure would result in a 3.5 percent reduction in drive-alone work trips (scaled down from 4.1 percent for Los Angeles).

This measure results in a two (2) percent reduction of 2020 unmitigated employee commute emissions.

R2EC3-INT: Increase Bicycling and Walking

This measure requires creating walking and bicycling incentives. According to a study of Los Angeles area employee commute trip reduction programs, the most effective strategy to reduce employee vehicle trips is to offer financial incentives to employees.⁶⁹ Biking/walking incentives can include “bike-to-work week,” monetary awards, bicycle parking and storage, marketing promotion, and parking incentives. The County can further encourage bicycling and walking by creating education programs, cycling maps, and reimbursing employee cycling mileage expenses.

GHG emission reductions associated with this measure are based on a study of 1,110 Los Angeles area employee commute trip reduction programs. Since the majority of these programs are within Los Angeles County, the effectiveness of these measures was adjusted to be applicable to San Bernardino County based on commute statistics for each county.

The following assumptions were used to calculate emission reductions attributed to this measure:

⁶⁷ Cambridge Systematics 1994.

⁶⁸ U.S. Census Bureau 2007.

⁶⁹ Cambridge Systematics 1994.

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- The effectiveness this measure is estimated to be 80 percent of that reported for Los Angeles County, due to the lower rate of workers walking or biking in San Bernardino County (in 2000, Los Angeles County had a 5 percent walking/biking rate while San Bernardino County had a 4 percent walking/biking rate).⁷⁰
 - This measure would result in a 2.1 percent reduction in drive-alone work trips (scaled down from 2.7 percent for Los Angeles).

This measure results in a two (2) percent reduction of 2020 unmitigated employee commute emissions.

R2EC4-INT: Increase the Use of Public Transit as an Alternative to Driving

This measure requires creating new or strengthening existing public transit incentives. According to a study of Los Angeles area employee commute trip reduction programs, the most effective strategy to reduce employee vehicle trips is to offer financial incentives to employees.⁷¹ Incentives include bus/rail/vanpool subsidies, free transit passes, parking incentives, commuter assistance and outreach, and marketing promotion. The County can further encourage transit use by improving rider information and education, creating park-and-ride facilities, providing transit maps and guides, and providing transit pass discounts.

GHG emission reductions associated with this measure are based on a study of 1,110 Los Angeles area employee commute trip reduction programs. Since the majority of these programs are within Los Angeles County, the effectiveness of these measures was adjusted to be applicable to San Bernardino County based on commute statistics for each county.

The following assumptions were used to calculate emission reductions attributed to this measure:

- The effectiveness this measure is estimated to be 20 percent of that reported for Los Angeles County, due to the lower rate of workers using mass transit in San Bernardino County (in 2000, Los Angeles County had a 7 percent transit use rate while San Bernardino County had a 1.5 percent transit use rate).⁷²
- This measure would result in a 0.6 percent reduction in drive-alone work trips (scaled down from 3.1 percent for Los Angeles).

This measure results in a 0.3 percent reduction of 2020 unmitigated employee commute emissions.

R2EC5-INT: Increase Use of Clean Air Vehicles

This measure requires implementing commuter assistance, outreach, and educational programs focused on encouraging employees to purchase hybrids and alternative fueled vehicles, and implementing parking incentives and marketing promotion. It would also require developing electric vehicle charging stations at County facilities to encourage use of plug-in hybrids and electric vehicles.

The following assumptions were used to calculate emission reductions attributed to this measure:

- It was assumed that a two (2) percent improvement in total commuter vehicle efficiency

⁷⁰ U.S. Census Bureau 2007.

⁷¹ Cambridge Systematics 1994.

⁷² U.S. Census Bureau 2007.

would occur.⁷³

- Measures R2EC1-INT through R2EC4-INT have been implemented.

This measure results in a 2 percent reduction of 2020 unmitigated employee commute emissions.

R3 Employee Commute Measures

This section describes R3 measures for Fleet/Fuel that were not quantified or relied upon to achieve the County's 2020 reduction target.

R3EC1-INT: Telecommuting, compressed work week.

This measure involves the County efforts to reduce emissions by encouraging telecommuting, compressed work weeks, and off-peak work hours, where appropriate.

At this time, the exact employee participant rates in the various components of this measure are unknown. Thus, no quantification of this measure was completed. Future inventories should capture the success in both R2 and R3 commute measures.

R3EC2-INT: County Commuter Services Program

The County's Human Resources Department has operated and will continue to operate an active and effective Commuter Services Program to encourage, coordinate, and reward alternative commuting for more than two decades. The County's Commuter Services Program provides employees with tools to find a carpool partner or vanpool, tips on bicycle commuting, and information on transit. Nearly 4,000 County employees take advantage of this program and enjoy the benefits of alternative commuting.

The exact amount of participation in this County program in the future is not known at this time and thus the amount of potential new GHG emissions reductions for this measure was not quantified.

Carbon Sequestration Measures

This section describes reduction measures related to Carbon Sequestration. These measures are classified as R3 measures and they were not quantified or relied upon to achieve the County's reduction target. These measures are either facilitative in nature or there are methodological issues that prevent their quantification at this time.

Carbon Sequestration – R3 County Measures

R3CS1-INT: Tree Management

The County will maintain and increase its tree inventory, and coordinate tree maintenance responsibilities with all responsible departments, consistent with best management practices.

The precise amount and type of new tree planting has not been determined at this time and thus no quantification of this measure has been completed at this time.

R3CS2-INT: Landscaping

The County will evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping and will install or replace vegetation with drought-tolerant, low

⁷³ San Francisco Department of the Environment 2004.

maintenance native species or edible landscaping that can also provide shade and reduce heat-island effects.

The precise amount of landscaping replacement has not been determined at this time and thus no quantification of this measure has been completed at this time.

List of Preparers

This analysis was a collaborative effort of San Bernardino County, ICF International and PBS &J. The key personnel involved are noted below.

ICF International

Working with the County, ICF developed the Internal GHG emissions inventory, forecasting, and quantification of reduction measures presented in this appendix. The following ICF personal were involved in this analysis.

- Rich Walter, Project Director
- Rebecca Rosen, Technical Director
- Tony Held, Senior Reviewer
- Brian Schuster, Lead Technical Analyst
- Phil Groth, Building Energy Analyst
- Aaron Burdick, Building Energy Analyst
- Carrah Bullock, Technical Analyst
- John Durnan, Graphic Artist
- Ralph Torrie, Former Project Director

San Bernardino County

San Bernardino County staff provided direction on the overall program, input on current County programs, and data for the GHG inventory. Multiple County departments were also involved in the development and evaluation of the GHG emissions reduction program. The following County staff and consultants were the primary staff involved in this effort for the County:

- Jim Squire, Assistant Director, Land Use Services Department
- Doug Feremenga, Project Manager
- Chris Warrick, Senior Planner
- Robin Cochran, Deputy County Counsel
- Randy Scott, Consultant to the County
- Michael Hendrix, PBS &J, Consultant to the County
- Julie Rynerson-Rock, Former Land Use Services Director

However, this analysis could not have been completed without the many contributions of staff in County departments including the following:

- Land Use Services Department,
- Fleet Management Department

-
- Waste Management Department,
 - Facilities Management Department,
 - Public Works Department/Flood Control District,
 - County Sheriff's Department,
 - County Fire Department,
 - Special Districts Department,
 - Regional Parks Department,
 - Human Resources Department, and the
 - Chief Administrator's office.

References

Printed references

- California Air Resources Board. 2002. *Assembly Bill No. 1493*. Available: <<http://www.arb.ca.gov/cc/ccms/documents/ab1493.pdf>>. Accessed: December 11, 2008.
- . 2007a. *Draft California Greenhouse Gas Inventory (millions of metric tons of CO₂ equivalent) — By IPCC Category*. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/rpt_Inventory_IPCC_Sum_2007-11-19.pdf>. Accessed: June 1, 2008.
- . 2007b. *Expanded list of early action measures to reduce greenhouse gas emissions in California recommended for board consideration*. Available: <http://www.arb.ca.gov/cc/ceca/meetings/ea_final_report.pdf>. Accessed: November 24, 2008.
- . 2007c. *Climate change draft scoping plan. Measure documentation supplement*. Pursuant to AB 32 The California Global Warming Solutions Act of 2006. Available: <http://www.arb.ca.gov/cc/scopingplan/document/measure_documentation.pdf>. Accessed: December 12, 2008.
- . 2007d. *Status report on the California Air Resources Board's zero emission vehicle program*. Available: <http://www.arb.ca.gov/msprog/zevprog/zevreview/zev_review_staffreport.pdf>. Accessed: December 12, 2008.
- . 2008a. *Climate change proposed scoping plan*. October. Available: <<http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf>>. Sacramento, CA.
- . 2008b. *Climate change proposed scoping plan. Volume 2: analysis and documentation*. Available: <<http://www.arb.ca.gov/cc/scopingplan/document/appendix2.pdf>>. Accessed: December 12, 2008.
- . 2008c. *Comparison of greenhouse gas emissions from natural gas and diesel vehicles*. Available: <http://www.arb.ca.gov/fuels/lcfs/100708ng_comparison.pdf>. Accessed: February 2, 2008.
- . 2008d. *Greenhouse Gas Sectors Portal: Transportation*. Available: <<http://www.arb.ca.gov/cc/ghgsectors/ghgsectors.htm#transport>>. Accessed: December 11, 2008.
- . 2008e. *Climate change proposed scoping plan. Volume I: supporting documents and measure detail*. Available: <<http://www.arb.ca.gov/cc/scopingplan/document/appendix1.pdf>>. Accessed: December 12, 2008.
- . 2008f. *Comparison of greenhouse gas reductions for the united states and Canada under U.S. Cafe standards and California air resources board greenhouse gas regulations*. Available: <http://www.arb.ca.gov/cc/ccms/reports/pavleycafe_reportfeb25_08.pdf>. Accessed: February 2, 2008.
- . 2008g. *California air quality legislation 2008 annual summary*. Available: <<http://www.arb.ca.gov/legis/as2008.pdf>>. Accessed: December 12, 2008.
- . 2008h. *Low-emission vehicle program*. Available: <<http://www.arb.ca.gov/msprog/levprog/levprog.htm>>. Accessed: December 11, 2008.
- . 2008i. *Fact Sheet: the zero emission vehicle program—2008*. Available: <<http://www.arb.ca.gov/msprog/zevprog/factsheets/2008zevfacts.pdf>>. Accessed: December 12, 2008.

-
- . 2008j. *Preliminary Summary of Air Resources Board Action (3/27/08) - Zero Emission Vehicle (ZEV) Program*. Available: <<http://www.arb.ca.gov/msprog/zevprog/zevreview/summary.pdf>>. Accessed: December 12, 2008.
- . 2009. *Greenhouse Gas Inventory Data—2020 Forecast*. Available: <<http://www.arb.ca.gov/cc/inventory/data/forecast.htm>>. Accessed: March 9, 2009.
- California Air Resources Board, California Climate Action Registry, ICLEI—Local Governments for Sustainability and The Climate Registry (CARB et al.). 2008. *Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories*. Version 1.0 September 25, 2008. Available: <http://www.arb.ca.gov/cc/protocols/localgov/pubs/final_lgo_protocol_2008-09-25.pdf>.
- California Climate Action Registry. 2009a. *Annual Emissions Report: Southern California Edison*. Available: <<https://www.climateregistry.org/CARROT/public/reports.aspx>>.
- California Commercial End Use Study. 2008. Available: <<http://capabilities.itron.com/CeusWeb/chart.aspx>>.
- California Energy Commission. 2005. *Assessment of California combined heat and power market and policy options for increased penetration*. Available: <<http://www.uschpa.org/files/public/Assessment%20of%20California%20Combined%20Heat%20and%20Power%20Market%2005.pdf>>.
- California Integrated Waste Management Board. 1999. *Countywide Profile for San Bernardino County*. Available: <<http://www.ciwmb.ca.gov/Profiles/County/CoProfile1.asp?COID=36>>. Accessed: February 5, 2009.
- . 2007. *Construction and demolition debris recycling: local government sample documents*. Available: <<http://www.ciwmb.ca.gov/ConDemo/SampleDocs/>>. Accessed: February 11, 2009.
- . 2009. *California Integrated Waste Management Board*. Available: <<http://www.ciwmb.ca.gov/>>. Accessed: February 2009.
- California Public Utilities Commission. 2008. *California long term energy efficiency plan*. Available: <<http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf>>.
- Cambridge Systematics. 2004. *The effects of land use and travel demand management strategies on commuting behavior*. (DOT-T-95-06.) Washington DC. Prepared for: Federal Highway Administration.
- Chester, Mikhail V. 2008. *Life-cycle Environmental Inventory of Passenger Transportation in the United States*. Institute of Transportation Studies, Berkeley. Available: <<http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1095&context=its>>. Accessed: February 4, 2008.
- City of Los Angeles. 2008. *Climate LA: municipal program implementing the GreenLA climate action plan*. Available: <<http://www.lacity.org/ead/environmentla/pdf/ClimateLA%20Program%20document%2012-08.pdf>>. Accessed: February 11, 2009.
- County of San Bernardino. 2000. *San Bernardino County Adult and Juvenile Needs Assessment—High Desert Complex Requirements Study and Options for Central Juvenile Justice Complex*. Final Draft Report, August 2000.
- . 2004. *Final Master Space Plan*. Gensler Team. July 2004.

-
- Energy Star. 2009. *Office Equipment, New Specifications Offered for Many Office Products in 2007*. Available: <http://www.energystar.gov/index.cfm?c=ofc equip.pr_office_equipment>. Accessed: February 2009.
- INFORM. 2003. *Greening Garbage Trucks: New Technologies for Cleaner Air*. Available: <<http://informinc.org/reportpdfs/st/GreeningGarbageTrucks.pdf>>. Accessed: February 4, 2009.
- Mills, Evan. 2004. *Cost Effectiveness of Commercial-Buildings Commissioning*. Available: <<http://eetd.lbl.gov/emills/PUBS/Cx-Costs-Benefits.html>>. Accessed: February 2009.
- National Highway Transportation Safety Administration. 2008. *Laws/Regulations/Guidance*. Available: <<http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/>>. Accessed: December 11, 2008.
- Natural Capitalism Solutions. 2007. *Climate protection manual for cities*. Available: <http://www.climatemanual.org/Cities/downloads/ClimateProtectionManual_Cities.pdf>. Accessed: November 24, 2008.
- San Francisco Department of the Environment. 2004. *Climate action plan for San Francisco: local actions to reduce greenhouse gas emissions*. Available: <<http://sfenvironment.org/downloads/library/climateactionplan.pdf>>. Accessed: February 20, 2009.
- South Coast Air Quality Management District. 2000. *Rule 1191. Clean on-road light- and medium-duty public fleet vehicles*. Available: <<http://www.aqmd.gov/rules/reg/reg11/r1191.pdf>>. Accessed: December 11, 2008.
- Southern California Edison. 2009. *Renewable Energy*. Available: <<http://www.sce.com/PowerandEnvironment/Renewables/>>. Accessed: February 2009.
- TIAX. 2005. *Comparative costs of 2010 heavy-duty diesel and natural gas technologies*. Available: <http://www.tiaxllc.com/reports/HDDV_NGVCostComparisonFinalr3.pdf>. Accessed: February 10, 2009.
- U.S. Census Bureau. 2007. *2007 American Community Survey 1-Year Estimates. B08130. Means of transportation to work by place of work-state and county level*. Available: <http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=ACS_2007_1YR_G00_&state=dt&mt_name=ACS_2007_1YR_G2000_B08130&_lang=en&_ts=269896072351>. Accessed: September 9, 2009.
- U.S. Environmental Protection Agency (USEPA). 2002a. *Clean alternative fuels: compressed natural gas*. Available: <<http://eerc.ra.utk.edu/etcfc/docs/EPAFactSheet-cng.pdf>>. February 5, 2009.
- . 2002b. *Clean alternative fuels: liquefied natural gas*. Available: <<http://eerc.ra.utk.edu/etcfc/docs/EPAFactSheet-lng.pdf>>. Accessed: February 5, 2009.
- . 2005. *Landfill Gas Emissions Model (LandGEM) Version 3.02 User's Guide*. May. EPA Clean Air Technology Center. Available: <<http://www.epa.gov/ttnecat1/dir1/landgem-v302-guide.pdf>>. Accessed: February 2009.
- . 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Available: <http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF>. Accessed: December 12, 2008.
- . 2008a. *Inventory of U.S. greenhouse gas emissions and sinks: 1990–2006*. Available: <http://www.epa.gov/climatechange/emissions/downloads/08_CR.pdf>. Accessed: December 12, 2008.

-
- . 2008b. *Gas Mileage Tips*. Available: <<http://www.fueleconomy.gov/feg/drive.shtml>>. Accessed: December 12, 2008.
- . 2008c. *Waste Reduction Model (WARM)*. Available: <http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html>. Accessed: February 5, 2009.
- . 2008d. *CHP Emissions Calculator*. Last revised: September 16, 2008. Available: <<http://www.epa.gov/chp/basic/calculator.html>>. Accessed: February 2009.
- . 2009. *Emissions & Generation Resource Integrated Database (eGRID)*. Version 1.1. Available: <<http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>>. Accessed: March 12, 2009.
- Victoria Transport Policy Institute. 2008. *Transit Demand Management Encyclopedia: Ridesharing and Vanpooling*. Available: <<http://www.vtpi.org/tdm/tdm34.htm>>. Accessed: September 9, 2009.
- United Nations Environment Program. 2007. *Comparison of clean diesel vehicles, CNG vehicles, and HEVs*. Available: <<http://www.unep.org/tnt-unep/toolkit/Actions/Tool13/energy.html>>. Accessed: February 10, 2009.

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APPENDIX C

RELEVANT (EXISTING) SAN BERNARDINO COUNTY GENERAL PLAN POLICIES

Ref #	Proposed Measures	Relevant (Existing) San Bernardino County General Plan Policies
ENERGY EFFICIENCY AND RENEWABLE ENERGY		
R2E1 R2E2 R2E3 R2E4 R2E5 R2E6 R2E7 R2E8 R2E9 R2E10 R3E1 R3E2 R3E3 R3E4 R3E8 R3E9 R3E10 R3E11 R3E12 R3E13 R3E14 R3E15	Green Building	<p>CO 8.5 There are unique climatic and geographic opportunities for energy conservation and small-scale alternative energy systems in each of the County's three geographic regions; therefore, the County shall:</p> <ul style="list-style-type: none"> a. Implement land use and building controls and incentives to ensure energy-efficient standards in new developments that comply with California energy regulations as minimum requirements. b. Quantify local climate variations and in each climatic region require energy conservation systems in new construction. c. Fully enforce all existing residential and commercial California Energy Commission energy conservation standards. <p>CO 8.6 Fossil-fuels combustion contributes to poor air quality. Therefore, alternative energy production and conservation will be required, as follows:</p> <ul style="list-style-type: none"> a. New developments will be encouraged to incorporate the most energy-efficient technologies that reduce energy waste by weatherization, insulation, efficient appliances, solar energy systems, reduced energy demand, efficient space cooling and heating, water heating, and electricity generation. b. All new subdivisions for which a tentative map is required will provide, to the extent feasible, for future natural heating or cooling opportunities in the subdivision. This can be accomplished by design of lot size and configuration for heating or cooling from solar exposure or shade and breezes, respectively. <p>H 2.10 Encourage the use of energy conservation features in residential construction, remodeling, and existing homes.</p> <p>Programs: CO 8.8 Promote energy-efficient design features, including appropriate site orientation, use of lighter-color roofing and building materials, and use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling.</p>
R3E1 R3E2 R3E4	Green Building Facilitation, Streamlining, and Training	<p>See policies above such as CO 8.6, CO 8.8, and H2.10 that promote energy-efficiency measures.</p>
R2E1	Community Building	<p>H 2.9 Continue the Insulation and Weatherization Program for eligible households.</p>

Ref #	Proposed Measures	Relevant (Existing) San Bernardino County General Plan Policies
	<p>Energy Efficiency and Conservation for Existing Buildings</p>	<p>Programs: Provide labor and materials to insulate and weatherize the homes of eligible low-income households.</p> <p>H 2.10 Encourage the use of energy conservation features in residential construction, remodeling, and existing homes.</p> <p>Programs: Help publicize energy conservation opportunities Southern California Edison offers, such as replacing old refrigerators, weatherproofing, energy-efficient lighting, cooling (evaporating coolers), and interruptible service.</p> <p>CO 8.9 Promote the use of automated time clocks or occupant sensors to control central heating and air conditioning.</p>
R3E4	<p>Energy Efficiency Financing</p>	<p>H 2.9 Continue the Insulation and Weatherization Program for eligible households.</p> <p>Programs: Provide labor and materials to insulate and weatherize the homes of eligible low-income households.</p> <p>CO 4.5 Reduce emissions through reduced energy consumption.</p> <p>Programs: Implement programs to phase in energy conservation improvements through the annual budget process.</p>
R3E5	<p>Heat Island Mitigation Plan</p>	<p>CO 8.5 There are unique climatic and geographic opportunities for energy conservation and small-scale alternative energy systems in each of the County's three geographic regions; therefore, the County shall:</p> <ul style="list-style-type: none"> a. Implement land use and building controls and incentives to ensure energy-efficient standards in new developments that comply with California energy regulations as minimum requirements. b. Quantify local climate variations and in each climatic region require energy conservation systems in new construction. c. Fully enforce all existing residential and commercial California Energy Commission energy conservation standards. <p>CO 8.8 Promote energy-efficient design features, including appropriate site orientation, use of lighter-color roofing and building materials, and use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling.</p>
R3E2 R3E6	<p>Public Education</p>	<p>H 2.10 Encourage the use of energy conservation features in residential construction, remodeling, and existing homes.</p> <p>Programs: Help publicize energy conservation opportunities Southern California Edison offers, such as replacing old refrigerators, weatherproofing, energy-efficient lighting, cooling (evaporating coolers), and interruptible service.</p>

Ref #	Proposed Measures	Relevant (Existing) San Bernardino County General Plan Policies
R3E8	<p>Community Alternative Energy Development Plan</p>	<p>CO 8.2 Conserve energy and minimize peak-load demands through the efficient production, distribution, and use of energy.</p> <p>Programs: The County will promote the education of its residents about utility energy conservation programs, including the California Energy Commission 20/20 Housing Advisory Commission recycling program, White Roof, and Solar Roof Initiatives.</p> <p>CO 8.3 Assist in efforts to develop alternative energy technologies that have minimum adverse effects on the environment, and explore and promote new opportunities for the use of alternative energy sources.</p> <p>Programs: <ol style="list-style-type: none"> 1. Encourage and assist in the location of manure recycling and energy conversion operations. 2. To reduce future demand on energy sources, all new subdivisions for which a tentative map is required will provide, to the extent feasible, for future natural heating or cooling opportunities in the subdivision. 3. For all new subdivisions for which a tentative map is required, a condition of approval will be the dedication of easements across adjacent parcels or units for the purpose of ensuring access to solar energy. 4. Encourage methanol production from biomass, wastes, natural gas, or coal to provide a cleaner substitute liquid fuel for automobiles, trucks, and electric generators. 5. All County facilities, actions, and policies will provide good examples of the best available technologies and methods for minimizing energy consumption and waste. </p>
R3E9	<p>Renewable Energy and Transmission Siting</p>	<p>CO 4.12 Provide incentives to promote siting or use of clean-air technologies (such as fuel-cell technologies, renewable energy sources, ultraviolet coatings, and hydrogen fuel).</p> <p>CO 8.1 Maximize the beneficial effects and minimize the adverse effects associated with siting major energy facilities. The County will site energy facilities equitably to minimize net energy use and consumption of natural resources, and avoid inappropriately burdening certain communities. Energy planning should conserve energy and reduce peak-load demands, reduce natural resource consumption, minimize environmental impacts, and treat local communities fairly in providing energy efficiency programs and siting energy facilities.</p> <p>Programs: <ol style="list-style-type: none"> 1. Monitor federal and state activity, including their review of proposed facilities, new legislation, new funding sources, and technological advances in the energy and telecommunications fields. 2. Develop a system to provide energy providers with detailed information of proposed residential, commercial, and industrial </p>

Ref #	Proposed Measures	Relevant (Existing) San Bernardino County General Plan Policies
		<p>developments as early as possible so that all necessary permits can be obtained and schedules met.</p> <ol style="list-style-type: none"> 3. Require undergrounding of new and existing transmission lines when feasible. 4. Assist in the development and use of new designs for major transmission line towers that are aesthetically compatible with the environment from a close viewing distance. 5. Because land uses adjacent to utility corridors must be compatible, the County will approve only those secondary uses within corridors that are compatible with adjacent land uses. 6. Include the location of underground pipelines and the type of fuel being carried in the pipelines on the Infrastructure Maps. 7. The County shall consult with the major electric utilities regarding the location of undergrounding of new and existing transmission lines, and consider the undergrounding of distribution lines when feasible and as determined by California state regulatory processes. 8. The County shall consult with electric utilities during planning of construction of their major transmission line towers to ensure that they are aesthetically compatible with the surrounding environment. <p>CO 9.2 The County will work with utilities and generators to maximize the benefits and minimize the impacts associated with siting major energy facilities. It will be the goal of the County to site generation facilities close to end-users to minimize net energy use and natural-resource consumption, and avoid inappropriately burdening certain communities.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Monitor federal and state activity, including their review of proposed facilities, new legislation, new funding sources and technological advances in the energy and telecommunications fields. 2. Develop a system to provide affected communities with detailed information about proposed facilities as early as possible. 3. The County will consult with the major electric utilities regarding the undergrounding of new and existing transmission lines when feasible and as determined by California state regulatory processes. 4. The County will consult with electric utilities during the construction of their major transmission-line towers to ensure that they are aesthetically compatible with the surrounding environment. 5. Because land uses adjacent to utility corridors must be compatible, the County will approve only those secondary land uses within corridors that are compatible with adjacent land uses. 6. Include the locations of underground pipelines and the types of fuels being carried in the pipelines on the Infrastructure Maps.
R3E10	<p>Remove Barriers to Renewable Energy Development</p>	<p>CO 8.3 Assist in efforts to develop alternative energy technologies that have minimum adverse effects on the environment, and explore and promote new opportunities for the use of alternative energy sources.</p> <p>Programs: All County facilities, actions, and policies will provide good examples of the best available technologies and methods for minimizing</p>

Ref #	Proposed Measures	Relevant (Existing) San Bernardino County General Plan Policies
R2E3 R2E4 R2E8 R2E9 R2E10 R3E12	Residential/ Commercial Renewable Energy Program	<p>energy consumption and waste.</p> <p>CO 8.3 Assist in efforts to develop alternative energy technologies that have minimum adverse effects on the environment, and explore and promote new opportunities for the use of alternative energy sources.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. For all new subdivisions for which a tentative map is required, a condition of approval will be the dedication of easements across adjacent parcels or units for the purpose of ensuring access to solar energy. 2. All County facilities, actions, and policies will provide good examples of the best available technologies and methods for minimizing energy consumption and waste.
R3E12	Renewable Energy Financing	<p>CO 8.3 Assist in efforts to develop alternative energy technologies that have minimum adverse effects on the environment, and explore and promote new opportunities for the use of alternative energy sources.</p>
R3E13	Regional Renewable Energy Collaboration	<p>CO 8.2 Conserve energy and minimize peak-load demands through the efficient production, distribution, and use of energy.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Work with other governmental agencies, utility companies, and the private sector to achieve energy conservation and the use of alternative energy resources and technologies. 2. Actively participate and represent the County in the development and implementation of standards and regulations under the jurisdiction of the State of California and the Federal Government. <p>CO 8.3 Assist in efforts to develop alternative energy technologies that have minimum adverse effects on the environment, and explore and promote new opportunities for the use of alternative energy sources.</p>

WASTE MEASURES		
<p>R2W4 R2W5 R2W6 R2W7 R3W1</p>	<p>Waste Minimization and Diversion</p>	<p>CO 8.7 Utilize source reduction, recycling and other appropriate measures to reduce the amount of solid waste disposed of in landfills.</p> <p>CI 14.1 Utilize a variety of feasible processes, including source reduction, transfer, recycling, land filling, composting, and resource recovery, to achieve an integrated and balanced approach to solid-waste management.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Seek federal and state funds for projects utilizing resource and material recovery processes. 2. Participate in resource and material recovery studies. 3. Continue recycling operations at County landfills; and expand recycling operations to other landfills or resource recovery facilities. <p>CI 14.2 Explore the feasibility and environmental impacts of reopening inactive landfills where there is useful capacity remaining.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Develop and implement methods to reduce the amount of wood and yard wastes being placed in landfills. 2. Assist the private sector wherever possible with developing methods for the reuse of inert materials (concrete, asphalt, and other building-material wastes) that use valuable landfill space. 3. Establish recycling programs; including those for household hazardous waste. 4. Limit or restrict incompatible land uses that might encroach waste-disposal facilities. 5. Continue to map the precise locations of all waste sites (existing, inactive, and closed) on the County's automated mapping system and create a database with information about air, soil, and water contamination and the types of wastes disposed of at each site. 6. Seek public involvement in the development of regional solid waste management recommendations. 7. Coordinate with cities and other affected agencies in seeking additional disposal capacity.

<p>R2W1 R2W2 R2W3 R3W3 R3W4 R3W5</p>	<p>Reduce Methane Emissions</p>	<p>CI 14.1 Utilize a variety of feasible processes, including source reduction, transfer, recycling, land filling, composting, and resource recovery to achieve an integrated and balanced approach to solid waste management.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Seek federal and state funds for projects utilizing resource and material recovery processes. 2. Participate in resource and material recovery studies. <p>CO 8.3 Assist with efforts to develop alternative energy technologies that have minimum adverse effects on the environment, and explore and promote new opportunities for the use of alternative energy sources.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Encourage and assist with the location of manure recycling and energy conversion operations. 2. Encourage methanol production from biomass, wastes, natural gas, or coal to provide a cleaner substitute liquid fuel for automobiles, trucks, and electric generators. 3. All County facilities, actions, and policies will provide good examples of the best available technologies and methods for minimizing energy consumption and waste.
<p>R3W3</p>	<p>Waste Minimization Public Education and Outreach</p>	<p>CI 14.4 Initiate educational and other programs to reduce waste generation, increase diversion of solid waste away from landfills, promote recycling, and identify new facilities for waste disposal in the County.</p> <p>D/CI 3.2 To discourage indiscriminate dumping in various areas in the desert, the County Solid Waste Management Division shall continue to provide educational programs regarding locations, days and hours of operation, recycling, free dump days, and other useful information that will keep the public informed about proper solid waste disposal and locations for household hazardous waste drop-off facilities.</p>
<p>WATER MEASURES</p>		
<p>R3WC1 R3WC2 R3WC3 R3WC4</p>	<p>Water Conservation</p>	<p>CI 11.9 Encourage water conservation, replenishment programs, and water sources in areas that have difficulty obtaining timely or economical water service from existing potential suppliers, or that have water quality or quantity problems.</p> <p>D/CI 3.1 The County Land Use Services Department shall promote water and soil conservation through a variety of measures:</p> <ol style="list-style-type: none"> a. Require native and drought tolerant landscaping or xeriscape to reduce watering needs, or retain native vegetation; b. Promote use of water-efficient irrigation practices for all landscaped areas; c. Minimize use of irrigated landscape areas in commercial landscapes; encourage soil conservation methods for weed abatement that also limit fugitive dust. d. Provide educational materials regarding native desert plant protection ordinances and protected wildlife.

		<p>D/CI 3.4 Where Commercial/Industrial/Multiple Family Residential uses are required through the Conditional Use Permit process to have landscaped areas, the following standards shall apply:</p> <ul style="list-style-type: none"> a. Landscaping will consist of native or drought-tolerant plants capable of surviving the desert environment and climate with a minimum of maintenance and supplemental watering. The use of turf shall be minimized. A list of plants determined capable of meeting these criteria is available. Other plants may be considered on their merits in meeting these criteria. Determination of plant species suitability will be made upon submission of project plans. b. A maximum of 10 percent of the project parcel shall be retained in planted landscaped areas in the interest of water conservation. Additional areas may include natural undeveloped and undisturbed areas that have sufficient native or compatible vegetation to promote a vegetated desert character and water conservation. All required vegetation shall be continuously maintained in a good condition. A landscape and irrigation plan shall be submitted and reviewed with any discretionary review request that proposes to install landscaping. c. Open space areas that are not to be left in a natural state will be landscaped with plants and vegetation in compliance with landscaping standards listed above. <p>D/CI 3.5 Encourage the adoption and implementation of a water conservation ordinance by each water service agency in the region. The goal is to minimize water use and extend the date at which utilization of State Project Water is required.</p> <p>D/CI 3.6 Require subdivisions in the region to have all common landscaping be consistent with xeriscape design, incorporating drought-tolerant plants as determined by the County and the water supply agency during review of landscape plans.</p> <p>D/CI 3.7 Encourage the use of ultra-low-flush (ULF) toilets in areas with water-supply limitations because their use at locations where septic tanks are acceptable can actually enhance septic tank operational efficiency.</p> <p>D/CI 3.8 The County shall require use of drip irrigation systems or systems of equivalent efficiency for all landscaping at commercial and industrial facilities and all common areas of residential developments. The County shall encourage the use of similar systems on individual residential lots.</p> <p>D/CI 3.9 The County shall encourage the use of pervious paving materials on all commercial, industrial, and institutional parking areas, where feasible. Large parking areas should consider using landscape as depressions to receive and percolate runoff as an alternative.</p> <p>CO 5.3 The County will promote water conservation and maximize the use of existing water resources by promoting activities/measures that facilitate the reclamation and reuse of water and wastewater.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. The County may require water reclamation systems and the use of reclaimed wastewater and other non-potable water to the maximum
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		<p>extent feasible for:</p> <ul style="list-style-type: none"> a. Agricultural uses, b. Industrial uses, c. Recreational uses, d. Landscape irrigation, and e. Groundwater recharge projects. <p>2. Apply water conservation and water reuse (reclamation) measures that are consistent with County, state, and/or federal policies and regulations on wastewater.</p> <p>3. Encourage the responsible authority to develop new and strengthen existing conservation and reclamation programs to reduce waterconsumption and prevent loss or waste of water.</p> <p>4. Encourage water agencies to use pricing as a conservation tool and to require water audits to ensure the effectiveness of and continued compliance with water conservation measures.</p>
R3WC1	<p>Manage Storm Water Runoff</p>	<p>CI 13.2 Promote the implementation of low-impact design principles to help control the quantity and improve the quality of urban runoff. These principles include:</p> <ul style="list-style-type: none"> a. Minimize changes in hydrology and pollutant loading; ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion and stream habitat; minimize the quantity of stormwater directed to impermeable surfaces; and maximize percolation of stormwater into the ground where appropriate. b. Limit disturbance of natural waterbodies and drainage systems; conserve natural areas; protect slopes and channels; c. Preserve wetlands, riparian corridors, and buffer zones; establish reasonable limits on the clearing of vegetation from the project site; d. Establish development guidelines for areas particularly susceptible to erosion and sediment loss; e. Require incorporation of structural and non-structural best management practices to mitigate projected increases in pollutant loads and flows. <p>D/CI 2.1 Retain the natural channel bottom for all storm water drainage facilities and flood control channels when such facilities are required for a specific development. This protects wildlife corridors and prevents loss of critical habitat in the region.</p> <p>M/CI 4.1 Retain the natural channel bottom for all storm water drainage facilities and flood control channels when such facilities are required for a specific development. This protects wildlife corridors and prevents loss of critical habitat in the region.</p>
R3WC2	<p>Conservation Areas</p>	<p>CI 11.10 Because recharge of groundwater basins is vital to the supply of water in the County, and because these areas can function only when retained in open space, the County will consider retaining existing groundwater recharge and storm flow retention areas as open space lands.</p> <p>M/OS 1.2 The County shall work with the U.S. Forest Service to explore land exchange opportunities that would provide additional areas for open space, recreational opportunities and watershed protection, and offer the County first right of refusal on lands available for</p>

		exchange before offering them to the general public.
		S 2.4 Protect vital groundwater resources and other natural resources from contamination for present and future beneficial uses.
TRANSPORTATION/LAND USE MEASURES		
R2T2	Vehicle Miles Traveled (VMT) Reduction (Also see subjects below; these policies relate to land use planning and vehicle-miles-traveled reductions in general)	CI 1.1 The County's comprehensive transportation system will be developed according to the Circulation Policy Map (the Circulation Element Map), which outlines the ultimate multi-modal (non-motorized, highway, and transit) system to accommodate the County's mobility needs and provides the County's objectives to be achieved through coordination and cooperation between the County and the local municipalities in the County, adjacent counties and cities within those counties, the California Department of Transportation (Caltrans), and San Bernardino Associated Governments (SANBAG).
R2T3		CI 2.2 Coordinate financial plans for transportation system improvements with other agencies and jurisdictions in the County.
R2T4		CI 2.3 Where appropriate, jointly fund studies and improvements to the transportation system, with cities and other public agencies and developers.
R2T6		CI 2.6 Seek grant funding for transportation system improvements, as appropriate.
R2T7		CI 2.7 Coordinate with Caltrans, SANBAG, the Southern California Association of Governments (SCAG) and other agencies regarding transportation system improvements in the County's Measure I and other adopted Capital Improvement Programs.
R3T1		CI 3.1 Encourage the reduction of automobile usage through various incentive programs.
R3T4		Programs: 1. Promote and institute incentive programs for the use of alternative transportation modes, such as County-sponsored vanpools, flexible working hours and alternate (for example, 4-day) workweeks.
R3T5		2. Provide a pattern of land use designations, along with appropriate development standards, that facilitates development of local retail uses near residential uses, consistent with Smart Growth and New Urbanism Concepts in new development to reduce the number of automobile trips by providing neighborhood shopping facilities and connectivity through pedestrian and bicycle paths.
R3T6		3. Promote and encourage the design and implementation of land uses, development standards, and capital improvement programs that maximize the use of public transit facilities and programs, and the availability of local retail uses accessible to local residents by walking or biking to reduce dependence on the automobile.
R3T7		4. Work with regional agencies (SCAG, Caltrans, SANBAG) to develop ridesharing programs, facilities, and various modes of public transit (local and rapid bus, Metrolink, and high-speed trains).
R3T8	5. Designate existing Park-and-Ride facilities on the General Plan Circulation Maps, work with Caltrans to identify appropriate future	
R3T9		
R3T10		

		<p>Park-and-Ride facilities, and develop a program to acquire and develop sites for such facilities in areas where there is an identified need.</p> <p>CI 4.2 To reduce the dependence on automobiles for local trips, integrate transportation and land use planning at the community and regional levels by promoting TOD, where appropriate and feasible.</p> <p>Programs: Encourage mixed-use and transit oriented design, where applicable. The integration of mixed-use and transit design could reduce the use of automobiles, but the extent of the benefits and remaining impacts might nonetheless require independent traffic impact analysis and environmental impact assessment.</p> <p>CI 4.5 Coordinate with local and regional transportation agencies and cities to plan and construct new multi-modal transportation facilities on the basis of this General Plan that are consistent throughout the neighboring jurisdictions.</p> <p>ED 10.1 Encourage a variety of industries to locate in the County, including commercial/professional office uses and “clean,” high-technology industries that provide high-skill/high-wage job opportunities.</p> <p>H 11.6 Throughout the County, continue to encourage mixed-use development through the planned development process that includes dense, multiple-family residential development and clustered, single-family residential development, and other uses that provide convenient shopping and employment opportunities close to major transportation corridors.</p> <p>Programs: Continue to reduce the length and number of vehicle trips, encourage use of public transportation, reduce vehicle emissions, and provide for a variety of lifestyle choices located convenient to travel requirements.</p> <p>LU 5.1 When a change in permitted land use(s) is proposed, review development applications to ensure that housing and employment opportunities (current and projected) are located close to each other, acknowledging housing and employment opportunities within both unincorporated County areas and cities.</p> <p>LU 6.1 Mixed-use developments will be encouraged in unincorporated areas of the County for projects that have adequate acreage to accommodate different land uses while providing buffers and other mechanisms to minimize or avoid land use conflicts.</p> <p>LU 9.2 Discourage leap-frog development and urban sprawl by restricting the extension or creation of new urban services or special districts to areas that cannot be sustained in a fiscally responsible manner.</p>
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<p>R3T1 R3T8 R3T9</p>	<p>Transit Measures</p>	<p>H 11.6 Throughout the County, continue to encourage mixed-use development through the planned development process that includes dense, multiple-family residential development and clustered single-family residential development, and other uses that provide convenient shopping and employment opportunities close to major transportation corridors.</p> <p>Programs: Continue to reduce the length and number of vehicle trips, encourage use of public transportation, reduce vehicle emissions, and provide for a variety of lifestyle choices located convenient to travel requirements.</p> <p>CI 3.1 Encourage the reduction of automobile usage through various incentive programs.</p> <p>Programs: 1. Provide a pattern of land use designations, along with appropriate development standards, that facilitates development of local retail uses near residential uses, consistent with Smart Growth and New Urbanism Concepts in new development to reduce the number of automobile trips by providing neighborhood shopping facilities and connectivity through pedestrian and bicycle paths. 2. Promote and encourage the design and implementation of land uses, development standards, and capital improvement programs that maximize the use of public transit facilities and programs, and the availability of local retail uses accessible to local residents by walking or biking to reduce dependence on automobiles. 3. Work with regional agencies (SCAG, Caltrans, SANBAG) to develop ridesharing programs, facilities, and various modes of public transit (local and rapid bus, Metrolink, and high-speed trains). 4. Designate existing Park-and-Ride facilities on the General Plan Circulation Maps, work with Caltrans to identify appropriate future Park-and-Ride facilities, and develop a program to acquire and develop sites for such facilities in areas where there is an identified need.</p> <p>CI 4.2 To reduce dependence on automobiles for local trips, integrate transportation and land use planning at the community and regional levels by promoting TOD, where appropriate and feasible.</p> <p>Programs: Encourage mixed-use and transit-oriented design, where applicable. The integration of mixed-use and transit design could reduce the use of automobiles, but the extent of the benefits and remaining impacts might nonetheless require independent traffic impact analysis and environmental impact assessment.</p> <p>CI 4.5 Coordinate with local and regional transportation agencies and cities to plan and construct new multi-modal transportation facilities on the basis of this General Plan that are consistent throughout the neighboring jurisdictions.</p>
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R2T2 R2T6 R2T8 R3T5 R3T6	Ridesharing and Carpooling	<p>ED 15.1 Facilitate economic development that will improve the overall jobs/housing balance in the major planning regions of the County, including a Mag-Lev/high-speed rail system that links San Bernardino County with other parts of the region.</p> <p>CI 3.1 Encourage the reduction of automobile usage through various incentive programs.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Promote and institute incentive programs for the use of alternative transportation modes, such as County sponsored vanpools, flexible working hours, and alternate (for example, 4-day) workweeks. 2. Designate existing Park-and-Ride facilities on the General Plan Circulation Maps, work with Caltrans to identify appropriate future Park-and-Ride facilities, and develop a program to acquire and develop sites for such facilities in areas where there is an identified need. <p>M/CI 1.10 Support the development of park-and-ride transit service in the mountain communities.</p> <p>M/CI 1.11 When population and residential densities permit or warrant, develop shuttle services from residential neighborhoods to recreational areas and major commercial centers.</p>
R2T2	Employee Vehicle Miles Traveled Reduction Programs	<p>CI 3.1 Encourage the reduction of automobile usage through various incentive programs.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Promote and institute incentive programs for the use of alternative transportation modes, such as County sponsored vanpools, flexible working hours and alternate (for example, 4-day) workweeks. 2. Work with regional agencies (SCAG, Caltrans, SANBAG) to develop ridesharing programs, facilities, and various modes of public transit (local and rapid bus, Metrolink, and high-speed trains). 3. Designate existing Park-and-Ride facilities on the General Plan Circulation Maps, work with Caltrans to identify appropriate future Park-and-Ride facilities, and develop a program to acquire and develop sites for such facilities in areas where there is an identified need. <p>CI 15.1 Maximize the use of telecommunications to reduce transportation and land use demands.</p>
R2T5	Expand Renewable Fuel Use	<p>CO 4.10 Support the development of alternative fuel infrastructure that is publicly accessible.</p>

R2T3	Revise Parking Policies	<p>CO 4.6 Provide incentives such as preferential parking for alternative-fuel vehicles (such as compressed natural gas or hydrogen).</p> <p>CO 4.7 Encourage special event center operators to provide discounted transit passes with event tickets or offer discounted on-site parking for carpooling patrons (for two or more persons per vehicle).</p> <p>CO 4.11 Establish programs for priority or free parking on County streets or in County parking lots for alternative fuel vehicles.</p> <p>M/CI 2.2.2 Reevaluate the parking requirements in the Development Code to ensure that excessive parking is not required, to address options for shared parking, covered parking, and other parking alternatives.</p> <p>M/OS 2.6 Where appropriate, require pedestrian walkways in commercial, industrial, and major multiple family residential developments.</p> <p>M/OS 2.7 Provide pedestrian linkages between adjacent commercial areas and adjoining residential areas to encourage foot traffic and reduce automobile trips.</p>
R2T4 R3T8	Roadway Modifications, Signalization, and Flow Management	<p>CO 8.4 Minimize energy consumption attributable to transportation in the County.</p> <p>CI 5.2 Protect and increase the designed roadway capacity of all vehicular thoroughfares and highways.</p> <p>Programs: Use existing and develop new innovative traffic engineering practices to increase roadway capacity and safety, such as synchronize signals.</p> <p>CO 8.4 Minimize energy consumption attributable to transportation in the County.</p>
R2T7	Bicycle/ Pedestrian Infrastructure and Promotion	<p>CI 6.1 Require safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial, and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips. Install bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available (see Figure 2-11A through Figure 2-11C of the Circulation and Infrastructure Background Report).</p> <p>CO 8.4 Minimize energy consumption attributable to transportation in the County.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Minimize the need to use automobiles and limit distance traveled by establishing mixed land uses and clustering development in nodes. 2. Through the land use zoning districts, encourage residences to be located near neighborhood commercial centers in new developments to encourage walking to nearby shops. 3. Encourage the development of recreation facilities in neighborhoods in new developments.

	<p>4. Amend the Development Code to require new subdivisions to provide bicycle facilities consistent with the County bikeway master plan.</p> <p>5. Provide appropriate facilities for safe bicycle and motorcycle parking in sites having high potential for bicycle and motorcycle traffic, such as apartments, condominiums, recreation facilities, shopping centers, offices, and industrial complexes.</p> <p>OS 2.1 Provide a regional trail system and rest areas to furnish continuous interconnecting trails that serve major populated areas of the County and existing and proposed recreation facilities through the regional trail system. The purpose of the County regional trails system will be to provide major backbone linkages to which community trails might connect. The provision and management of community and local trails will not be the responsibility of the regional trail system.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Provide equestrian, bicycling, and pedestrian staging areas consistent with the master plan of regional trails and the trail route and use descriptions shown in Figures 2-11A through 2-11C of the Circulation Background Report. 2. Work with local, state, and federal agencies, interest groups, and private landowners to promote an interconnecting regional trail system and to secure trail access through purchase, easements, or other means. <p>OS 2.2 Utilize public funding mechanisms whenever possible to protect and acquire land for open space uses.</p> <p>Programs:</p> <ol style="list-style-type: none"> 1. Actively seek state, federal, and private grants for the purpose of financing open space and trail acquisition, construction, and operation. 2. Use general funds, user fees, proceeds from concession operations, and other available sources to finance open space and trail acquisition, construction, and operation. 3. Include open space and trail acquisition and development in the County’s Capital Improvement Programs. <p>CI 6.1 Require safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial, and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips. Install bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available (see Figure 2-11A through Figure 2-11C of the Circulation and Infrastructure Background Report).</p> <p>M/OS 2.3 In the communities of Lake Gregory, Lake Arrowhead, Grass Valley Lake, Fawnskin, and Big Bear City, establish a system of bicycle and hiking routes connecting major activity centers, where feasible.</p> <p>M/OS 2.4 Develop a system of bicycle routes to link new and existing residential areas with major activity and commercial centers.</p> <p>M/OS 2.5 Encourage the addition of bicycle routes whenever existing highways are widened or significant lengths of highways are improved.</p>
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		<p>M/OS 2.6 Where appropriate, require pedestrian walkways in commercial, industrial, and major multiple family residential developments.</p> <p>M/OS 2.7 Provide pedestrian linkages between adjacent commercial areas and adjoining residential areas to encourage foot traffic and reduce automobile trips.</p> <p>M/ED 1.6 Encourage the creation of hiking and biking trails as tourist attractions.</p> <p>V/OS 1.1 Develop a plan to obtain, develop, and maintain hiking trails and pedestrian walkways between communities and neighborhoods in the Valley area.</p> <p>CO 8.4 Minimize energy consumption attributable to transportation in the County.</p>
R2T1	Anti-Idling	
R3T4 R3T9	Regional Land Use/Transportation Coordination	<p>CI 1.1 The County’s comprehensive transportation system will be developed according to the Circulation Policy Map (the Circulation Element Map), which outlines the ultimate multi-modal (non-motorized, highway, and transit) system to accommodate the County’s mobility needs and provides the County’s objectives to be achieved through coordination and cooperation between the County and local municipalities in the County, adjacent counties and cities in those counties, Caltrans, and SANBAG.</p> <p>CI 2.2 Coordinate financial plans for transportation system improvements with other agencies and jurisdictions in the County.</p> <p>CI 2.3 Where appropriate, jointly fund studies and improvements to the transportation system with cities and other public agencies and developers.</p> <p>CI 2.6 Seek grant funding for transportation system improvements, as appropriate.</p> <p>CI 2.7 Coordinate with Caltrans, SANBAG, SCAG, and other agencies regarding transportation system improvements in the County’s Measure I and other adopted Capital Improvement Programs.</p> <p>ED 10.1 Encourage a variety of industries to locate in the County, including commercial/professional office uses and “clean,” high-technology industries that provide high-skill/high-wage job opportunities.</p> <p>LU 5.1 When a change in permitted land use(s) is proposed, review development applications to ensure that housing and employment opportunities (existing and projected) are close to each other, acknowledging housing and employment opportunities in both unincorporated County areas and cities.</p>

		<p>LU 6.1 Mixed-use developments will be encouraged in unincorporated areas of the County for projects that have adequate acreage to accommodate different land uses while providing buffers and other mechanisms to minimize or avoid land use conflicts.</p> <p>LU 9.2 Discourage leap-frog development and urban sprawl by restricting the extension or creation of new urban services or special districts to areas that cannot be sustained in a fiscally responsible manner.</p>
AGRICULTURAL AND RESOURCE CONSERVATION MEASURES		
R3NR1 R3NR2	Conservation Areas and Compensation	<p>LU 7. The distribution of land uses will be consistent with the maintenance of environmental quality, conservation of natural resources, and the preservation of open spaces.</p> <p>M/CO 2. Maintain the health and vigor of the forest environment.</p> <p>M/LU 1.10 In the Mountain Region of the County, utilize construction techniques for single family homes that will preserve the forest character of the region by minimizing disruption of land and vegetation during construction.</p>
R3NR3	Urban Forestry	<p>CO 8.8 Promote energy-efficient design features, including appropriate site orientation, use of lighter-color roofing and building materials, and use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling.</p>

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APPENDIX D

**SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
INVENTORY**

APPENDIX D - SCAQMD Inventory

Overview

As part of the process of preparing its GHG Reduction Plan, the County of San Bernardino (County) requested South Coast Air Quality Management District (SCAQMD) to assist with the County's effort to identify and inventory GHG emissions. In response to the County's request, SCAQMD prepared inventories for the years 1990, 2007, and 2020 dated May 2009, and revised December 2010 ("SCAQMD Inventory"). A summary of the SCAQMD data collection methodology and findings is presented below. The County also retained ICF International to assist with the preparation of the GHG Reduction Plan, as well as a detailed inventory for the emissions generated by community activities and its own government operations. A summary of the inventories prepared by ICF International is presented below and are fully set forth in **Appendices A and B**, to this Plan.

SCAQMD Inventory

The SCAQMD Inventory included emissions within the entire County area ("Countywide.") The SCAQMD Inventory can be found in Appendix D. The Countywide emissions are not broken out by incorporated or unincorporated area. SCAQMD scaled the Countywide emissions to the County's land use authority (LUA) area, using the ratio of the population (14.6 percent) in the LUA area to that of the entire County. The base year for SCAQMD's Countywide and LUA area GHG inventories is 2002. This base year inventory was projected to future years using the socioeconomic forecasts provided by Southern California Association of Governments (SCAG) for the 2007 Air Quality Management Plan (AQMP). SCAQMD's 1990 inventory was prepared by backcasting, using the same SCAG and AQMP growth factors used to project the 2020 emissions forecast. The SCAQMD 1990 Countywide Inventory was 27 MMTCO_{2e}. The SCAQMD Inventory estimates for 1990 emissions in the unincorporated County were 2.96 MMTCO_{2e}, for 2007 emissions were 3.93 MMTCO_{2e} and forecasted 2020 emissions would be 5.02 MMTCO_{2e}.

SCAQMD emissions data for several emissions categories was included in the External Inventory prepared by ICF International. These categories include on- and off-road transportation, stationary sources, agriculture, and miscellaneous sources. These emissions sectors were scaled by either the ratio of population or natural gas usage in the LUA area to that of the entire County (see Appendix A for further discussion). Together, these emissions sources constitute 32 percent and 35 percent of the External Inventory for 2007 and 2020 (unmitigated) respectively.

There are several notable differences between the SCAQMD Inventory and the External Inventory prepared by ICF International in the methodology used to develop the two inventories. The SCAQMD Inventory was conducted to report emissions that occur within the County and followed the protocols for mandatory reporting of greenhouse gas emissions found in Title 17,

California Code of Regulations Sections 95100–95133. In contrast, the External Inventory prepared by ICF international and relied upon in this Plan was prepared to support GHG reduction quantification and planning, and, as such, follows inventory protocols including the LGOP, CCAR guidance, and USEPA (2007, 2008, 2009a, 2009b). **Table D-1** presents a comparison between the SCAQMD Inventory and the External Inventory in this Plan.

Table D-1. SCAQMD and ICF International External Inventory Comparisons (MMTCO₂e)

Sector	2007		2020	
	SCAQMD Inventory	ICF International Inventory	SCAQMD Inventory	ICF International Inventory
Total GHG emissions	3.93	6.25	5.02	7.59

The following major differences between the two (2) inventories are noted:

- *Electricity*: The SCAQMD Inventory included all emissions associated with generation of electricity within the County. The ICF International External Inventory, included indirect¹ emissions associated with the consumption of electricity within the County, regardless of where the generation of electricity occurred. This approach is consistent with IPCC, CARB, and CCAR inventory protocols and was used for this Plan because accounting for electricity consumption allows one to evaluate the potential effects of different approaches to promoting energy efficiency and alternative energy sources on reducing GHG emissions.
- *Landfills*: The SCAQMD Inventory included both landfill methane emissions as well as CO₂ emissions from landfill flaring in the County inventory. The ICF International External Inventory included landfill methane emissions but excluded CO₂ emissions from landfill flaring, consistent with applicable protocols, since CO₂ from flaring is biogenic in origin, and thus its generation at the landfill does not represent a net increase in atmospheric concentration (IPCC 2006; CARB et al. 2008).
- *Cement plants*: There are four (4) cement plants located in the County and three (3) are located inside the County's LUA area. These three (3) cement plants represent over 50 percent of cement plant-related emissions in the County. The SCAQMD Inventory included fuel combustion for cement plants in the entire County and scaled these emissions by the ratio of the population in the LUA area to that of the entire County to estimate emissions for the LUA area only. The ICF International External Inventory includes both cement plant fuel combustion and fugitive emissions of CO₂ from chemical reactions that occur during the production of cement for the three (3) cement plants in the County's LUA area. These emissions are specific to the facilities in the LUA area.

¹GHG emissions are categorized as either *direct* (emissions that occur at the end use such as natural gas combustion for building heating) or *indirect* (emissions that result from consumption at the end use but occur at another location such as emissions from electricity).

- *1990 inventory year:* Although the SCAQMD Inventory includes a Countywide emissions inventory for 1990 based on backcasted growth factors provided by SCAG, this Plan does not use that 1990 emissions estimate for purposes of calculating the County's 2020 GHG emissions reduction goal. The SCAQMD Inventory found that 1990 emissions for the land use jurisdiction were approximately 18 percent less than the 2007 emissions estimated by SCAQMD. It should be noted that the SCAQMD 1990 and 2007 inventories are based on a backcast and forecast, respectively, from a 2002 inventory, and thus there is some uncertainty in the prevision of comparison of the 1990 and 2007 emissions levels. In addition, the SCAQMD Inventory methodology differs from that used in this report, particularly as it relates to electricity emissions and landfill emissions. Thus, strict comparison of the two (2) inventories is not appropriate.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

**Greenhouse Gas (GHG) Inventories
for the County of San Bernardino**

**Technical Document: Methodology, Assumptions,
Data Sources and Inventory**

**May 2009
(Revised December 2010)**

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TABLE OF CONTENTS

Preface	1
Background	1
Emission Inventory Methodology	2
Introduction	2
Source Categories	2
Stationary Sources	2
On-Road Mobile Sources	3
Off-Road Mobile Sources	4
Electricity Usage	4
Pollutants	5
Inventory Projection/Backcast.....	5
Summary of San Bernardino GHG Inventories	5
References	10
Appendices	
A – GHG Emissions per Major Source Categories	A-1 to A-11
B – GHG Emissions from Electricity Usage	B-1
C – San Bernardino County Land Use Map.....	C-1
D – Dairy, Manure and Digestive Methane Inventory Documentation.....	D-1
List of Tables	
1 – CO ₂ E Inventory for Entire San Bernardino County, MMT	7
2 – CO ₂ E Inventory for Unincorporated Areas of the County, MMT.....	7
A-1 – 1990 GHG Emissions per Major Source Category for San Bernardino County	A-1
A-2 – 2002 GHG Emissions per Major Source Category for San Bernardino County	A-3
A-3 – 2007 GHG Emissions per Major Source Category for San Bernardino County	A-5

A-4 – 2020 GHG Emissions per Major Source Category for San Bernardino County.....	A-7
A-5 – 2002 Daily Fuel Consumption per Major Source Category for San Bernardino County	A-9
B-1 – 1996 San Bernardino County GHG Emissions from Electricity Usage	B-1
B-2 – 2005 San Bernardino County GHG Emissions from Electricity Usage	B-1
D-1 – 1990 San Bernardino County Dairy GHG Emissions Summary	D-1
D-2 – 1990 San Bernardino County Dairy GHG Manure Methane Emissions	D-2
D-3 – 1990 San Bernardino County Digestive Methane Emissions	D-3
D-4 – 1990 San Bernardino County N ₂ O Emissions from Manure Management	D-4
E-1 – San Bernardino County Population and Employment Data	E-1
E-2 – Population Data for Areas under County’s Jurisdiction	E-1

List of Figures

1 – 1990 San Bernardino County Inventory.....	9
2 – 2007 San Bernardino County Inventory.....	9
3 – 2020 San Bernardino County Inventory.....	9
C-1 – San Bernardino County Land Use Map	C-1

PREFACE

This document summarizes the collaborative effort of staffs at the South Coast Air Quality Management District (SCAQMD), Mojave Desert Air Quality Management District (MDAQMD), the County of San Bernardino (County) and their consultants, to develop greenhouse gas (GHG) inventories for the County for the years 1990, 2007 and 2020. The purpose of this document is to outline the methods and assumptions used, the sources of data, the limitations of the estimates, and a summary of the inventories developed, by major source category. This approach largely relies on the same inventory methodology used to develop the latest Air Quality Management Plan (i.e., 2007 AQMP) and represents one approach for developing a GHG emissions inventory. There are other appropriate methodologies and protocols that can be used. This document may be useful to other cities or counties that are developing GHG inventories.

BACKGROUND

The County is in the process of preparing a GHG Reduction Plan that will quantify emissions over which the County has discretionary land use or internal operational control, set a reduction target, and develop quantifiable mitigation measures to reduce those emissions. The County requested that SCAQMD assist with its effort to identify and inventory GHG emissions.

As part of a settlement agreement with the California Attorney General (hereafter, settlement agreement), the County of San Bernardino agreed that its GHG Plan would include the following:

- (1) Inventories for 1990, existing emissions, and 2020; and,
- (2) A target for reduction of the GHG emissions related to the County's discretionary land use decisions and internal county operations.

The County agreed to provide 1990 emissions for the entire County; however, the other two inventories were to include only areas under the County's discretionary land use authority and the County's internal operations. The County cannot regulate projects within boundaries of the incorporated cities, land managed by the federal government such as those lands under the Bureau of Land Management (BLM), and military bases and installations. Public utilities and railroads are generally not subject to the County's land use jurisdiction. Water districts/agencies are also not subject to the County's land use jurisdiction; however, private water companies generally are. Figure C-1 in Appendix C shows the map provided by the County, which depicts incorporated and unincorporated portions of the County, as well as federal and state lands within the County.

EMISSION INVENTORY METHODOLOGY

Introduction

The methodology used for developing this GHG inventory is primarily consistent with the SCAQMD 2007 Air Quality Management Plan (AQMP) inventory method, which utilized 2002 data as the base year. Since the County is located in two air basins (the South Coast and the Mojave Desert Air Basins), the data collected and developed by the MDAQMD was combined with the SCAQMD data. San Bernardino County staff also provided additional data to augment the AQMP inventory, such as electricity consumption² and dairy activity³. The following sections describe the key elements of the County GHG inventories.

Source Categories

As described below, the GHG inventory has four major categories: stationary sources, on-road mobile sources, off-road mobile sources, and electricity usage.

Stationary sources: The stationary source emissions are grouped into two categories - point sources and area sources. Point source emissions are from facilities having one or more pieces of equipment registered and permitted with SCAQMD (e.g. power plants and manufacturing facilities). SCAQMD is able to collect facility emission-related information from the larger of these facilities. Area source emissions are from numerous smaller facilities (e.g., gas stations, and restaurants) or the source of emissions (e.g., consumer products and architectural coatings), for which locations may not be specifically identified.

For the stationary point and area source inventory, SCAQMD staff used the 2007 AQMP base year inventory (2002 data) stationary source emission inventory for the portion of San Bernardino County under SCAQMD jurisdiction. SCAQMD staff obtained the 2002 point and area source emission inventory for the Mojave Desert portion of San Bernardino County from the MDAQMD. The carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) emissions for both stationary point and area sources associated with fuel combustion sources were calculated using the actual reported fuel consumption by fuel type, CO₂, N₂O, and CH₄ default Emission Factors (EFs), and fuel High Heating Values (HHVs). Default EFs were developed using Tables 3, 4, and 6 of the California Air Resources Board (CARB) Regulation for the Mandatory Reporting of GHG Emissions. The HHVs of the fuels were taken from AP-424. For non-combustion sources, the CH₄ emissions were estimated utilizing the Total Organic Gases

² Obtained from the California Energy Commission

³ Obtained from the San Bernardino County Department of Agriculture, Weights, and Measures, June 2008

⁴ EPA 1995: AP-42: Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I: Stationary Point and Area Sources, Appendix A: Miscellaneous Data & Conversion Factors

(TOG) emissions and CARB speciation profiles used for the 2007 AQMP. Once the 2002 GHG emissions inventory was developed, it was backcasted to year 1990 and projected to future years using growth factors provided by Southern California Association of Governments (SCAG) for the 2007 AQMP.

The following sections provide additional information on inventory development for sub-categories.

Agriculture

The County Department of Agriculture, Weights and Measures provided emissions estimates for livestock-dairy and manure management for the year 1990, which were added to the stationary and area source inventory under the major source category titled “Miscellaneous Processes, Farming Operations”, with EIC 620. Details for dairy manure methane emissions, digestive methane emissions, N₂O emissions from manure management and a summary of dairy emissions are provided in Appendix D. Growth projections for the agriculture sector for the County provided by SCAG were used to estimate emissions for the years 2007 and 2020. The CH₄ emissions for all other sources under farming operations (i.e. Livestock-Broilers, Layers, Turkeys, etc.) were calculated using the TOG emissions and CARB speciation profiles. N₂O emissions were estimated using the dairy N₂O emissions and ratio of the CH₄ emissions of each source to the Dairy category.

The 2002 GHG emissions from prescribed burning under the agricultural burning category with EIC 670 were calculated using the actual burning activities as reported in the 2002 emissions inventory and their associated EFs⁵.

Landfills

The 2002 GHG emissions from landfill sources under the waste disposal category were estimated using the 2002 annual emission data as reported by these sources, CARB default EFs, and fuel HHVs.

On-road mobile sources: The CARB EMFAC2007 V2.3 mobile source emissions model is the source of the 2007 AQMP emission estimates for on-road motor vehicles. The California Department of Transportation (Caltrans), the Department of Motor Vehicles (DMV), and SCAG supply CARB with the data necessary to develop the on-road mobile source emissions inventory. The EMFAC2007 model contains an output for CO₂ and CH₄ emissions for specified inventory years. SCAQMD staff calculated N₂O emissions based on CARB's

⁵ EFs were developed using Andreae and Merlet report titled “Emission of Trace Gases and Aerosols from Biomass Burning, Global Biogeochemical Cycles”, 2001, and CARB report on “Emission Factors for Open Burning of Agricultural Residues”, August 2000

methodology (i.e., vehicle miles traveled and CARB N₂O emission factors which are a function of vehicle type, model year, and fuel type). Currently, this model does not have data regarding natural gas vehicles and therefore, they are not included in this analysis.

Off-road mobile sources: Mobile sources not included in the on-road mobile source emissions inventory are considered as off-road mobile sources. CARB uses the OFFROAD Model to estimate emissions for more than one hundred off-road equipment types, including recreational vehicles, pleasure craft, and construction equipment. The emissions from ships, aircraft, locomotives and cargo handling equipment at marine ports or intermodal facilities are not included in the current OFFROAD Model. Therefore, the emissions from these categories need to be calculated using other category-specific models. Aircraft⁶ emissions were calculated using fuel consumption provided by CARB and default EFs.

Locomotive emissions were estimated using an alternative approach. Staff used the CARB's statewide locomotive GHG emissions and the carbon monoxide (CO) ratio of the County to the state to estimate the emissions for this category. A different methodology should be considered as the GHG inventory is updated in the future. Emissions from Cargo Handling Equipment (CHE) associated with the locomotives were calculated by first estimating the CHE statewide CO₂ emissions for the years 1990, 2002, 2007 and 2020 using CARB 2004 CHE population activity, horse power, CO₂ EF, and growth factors. The growth factors were developed based on the 2004, 2010, and 2020 CHE population activities and interpolation and extrapolation. Then, the County CO₂ emissions were estimated using the CO ratio of the County to the state. The N₂O and CH₄ emissions from this category were assumed to be negligible. The emissions from ships and commercial boats, and associated with marine ports were not applicable to San Bernardino County as these operations did not take place in this region.

Electricity usage: In order to account for GHG emissions that occurred due to consumption of electricity within the County regardless of where the emissions were generated, the County provided SCAQMD staff with the actual electricity usage for residential and non-residential sectors for the years 1996 and 2005 (see Appendix B). Estimates of electricity usage for both residential and non-residential sectors for the years 1990, 2007 and 2020 were derived based on the County's population and employment growth relative to the years 1996 or 2005 using the least squares straight line equation. Emission factors for electricity generation were as reported to the California Climate Action Registry for the Southern California Edison (SCE) service territory. These electricity usage emissions are presented for reference purposes only and were not added to the

County inventories, since they partially overlap with the in-County power plant emissions.

Pollutants

For purpose of the County GHG inventories, only three major pollutants were included: CO₂, CH₄, and N₂O. These emissions are typically reported in millions of metric tons (MMT) of carbon dioxide equivalents (CO₂E), which is the amount of CO₂ that would give the same global warming potential as a given amount of another GHG. For example, methane (CH₄) is a GHG which has a higher global

⁶ Based on the San Bernardino County Department of Airports, there are six airports that are operated by the County; Apple Valley, Baker, Barstow-Daggett, Chino, Needles, and Twentynine Palms. Further information (location, etc) about these airports can be accessed at: <http://www.sbcounty.gov/airports>

warming potential than CO₂. To convert a metric ton of methane to a metric ton of CO₂E, a factor of 21 is used (consistent with ARB's GHG inventory development, based on the second assessment report (1996) of the International Panel on Climate Change (IPCC)).

Inventory Projection/Backcast

The most recently prepared complete stationary source emissions inventory for the County was the one for the year 2002. Therefore, the stationary source inventories for the years 1990, 2007 and 2020 were forecasted and backcasted from the 2002 inventory using the same growth surrogates and SCAG growth factors as used in the 2007 AQMP, Appendix III, Tables 2-2 through 2-7 for the SCAB portion of the County. The selection of the surrogate by which emission growth is projected depends on the type of activity. Generally these surrogates include employment growth, industry output growth, etc. The growth factors for the Mojave Desert portion of the County are consistent with the attainment demonstration used in the MDAQMD Federal 8-hour Ozone Attainment Plan, July 2008. The on-road and off-road GHG inventories were developed for all the above years using the CARB EMFAC2007 and 2007 OFFROAD models. The CARB models contain emission reductions from all rules adopted by 2007.

SUMMARY OF SAN BERNARDINO GHG INVENTORIES

In addition to the year 2002, GHG emissions inventories were developed for the years 1990, 2007 and 2020, as described in the following sections. For 2007 and 2020, the settlement agreement required inventories of emissions related to internal County operations and the County's discretionary land use decisions. To estimate the areas under the County's discretionary land use authority, the County provided a map showing these areas and also provided the 2007 population data from the Department of Finance for the unincorporated areas of the County (see Appendix E). Figure C-1 in Appendix C shows the map provided by the County, which depicts incorporated and unincorporated portions of the County, as well as federal and state lands within the County. To determine the portion of GHG emissions attributable to the County, SCAQMD staff excluded the emissions from the operations that were not subject to the County's land use jurisdiction such as utilities, railroads, and military aircraft and proportioned the remaining County-wide GHG emissions inventory based upon the population residing in the unincorporated area of the County. The percentage of population in the unincorporated areas compared to the total County population was calculated to be 14.6% (based on the 2007 California Department of Finance Projections) which was used to derive the GHG emissions. Therefore, after exclusion of the emissions associated with utilities, railroads, and military aircraft, the County-wide inventory shown in Table 1 was multiplied by 0.146 to estimate the GHG emissions from unincorporated portions of the County (see Table 2).

Table 1 summarizes the applicable inventories by milestone year by major source category. This information is for the County as a whole. The inventory in Table 1 includes all sources regardless of whether the County has authority to control the emissions.

Table 1*
CO₂E Inventory for Entire San Bernardino County, MMT

	Category	1990	2002	2007	2020
Mobile On-Road	All	8	10	11	15
Mobile Off-Road	Locomotives	1	1	1	1
	Aircraft	0	0	0	1
	Other	0	1	1	1
Stationary	Utilities	3	3	4	5
	Landfills	1	1	1	1
	Other	12	10	10	12
Total		25	25	28	36
Electricity Usage		2	4	5	6

Table 2 shows the inventories for unincorporated areas of the County for the years 1990, 2002, 2007 and 2020.

Table 2*
CO₂E Inventory for Unincorporated Areas of the County, MMT

	1990	2002	2007	2020
Mobile On-Road	1.15	1.47	1.64	2.19
Mobile Off-Road	0.12	0.14	0.15	0.22
Stationary	1.34	1.35	1.48	1.74
Total	2.61	2.96	3.27	4.15
Electricity Usage	0.35	0.53	0.66	0.87

*Values in the total may be slightly off due to rounding to the nearest ton.

**The values in Table 2 are generated by multiplying the values in Table 1 (excluding the emissions from utilities, railroads, and military aircraft) by 0.146.

The following figures, Figures 1 through 3, show the relative contribution of each of these major categories to the County inventories for each of the key years selected. As shown in Figures 1 through 3, the mobile source category (on-road and off-road) contributes 37% and 50% of the total County GHG emissions in 1990 and 2020, respectively. This is consistent with the statewide inventory for which the mobile sources are the largest contributor, with 35% in 1990 and 38% in 2002 to 2004 average emissions of the state's total GHG emissions. The projected contribution of mobile sources increases slightly over this time period. These projected emissions do

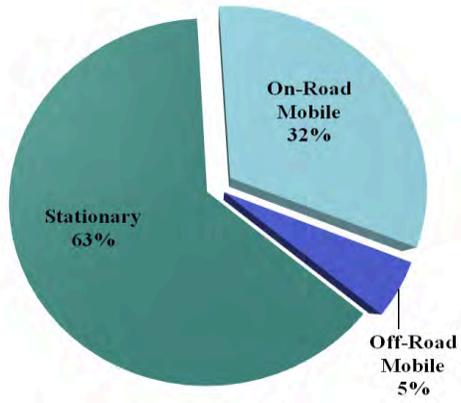
not account for potential reduction measures due to implementation of the AB 32 Scoping Plan, future AQMPs, or County reduction measures.

Tables A-1 through A-5 in Appendix A provide more detailed inventories by major source category for the years 1990, 2002, 2007 and 2020. The categorization is consistent with the AQMP inventory. The GHG emissions are presented in terms of tons per year (TPY) and Million Metric Tons (MMT) of CO₂E. The emission values are rounded off to the nearest ton and therefore zero values range from 0.00 to 0.49. Table A-5 shows the daily fuel consumption by major source category by fuel type in 2002, which forms the basis for combustion-related GHG emission estimates.

Discussion

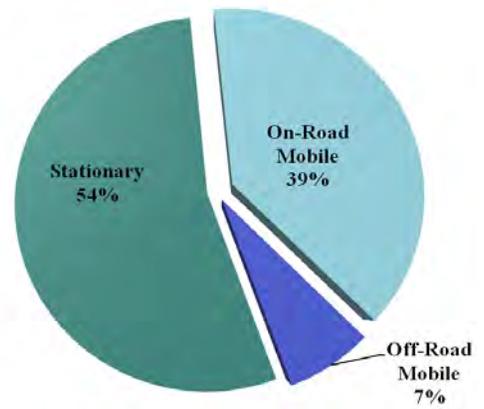
The SCAQMD staff believes the GHG emissions inventory developed for San Bernardino County represents a first of its kind bottom-up GHG inventory at a local level. The inventory methodology is primarily based on the methodology used to develop the SCAQMD 2007 AQMP, and is consistent with the State Implementation Plan (SIP) approach, such that it can be easily integrated with the local SIP planning process. The methodology outlined in this document takes advantage of years of technical improvements for criteria pollutant inventories and the benefits of extensive public review and agency oversight. Enhancements were made to GHG inventories regarding indirect emissions (i.e., electricity consumption). As additional technical information and standardized GHG inventory protocols endorsed by CARB become available over time, the GHG inventories can be further enhanced by including additional pollutants, improved methodology or better emission factors.

Figure 1
1990 San Bernardino County Inventory



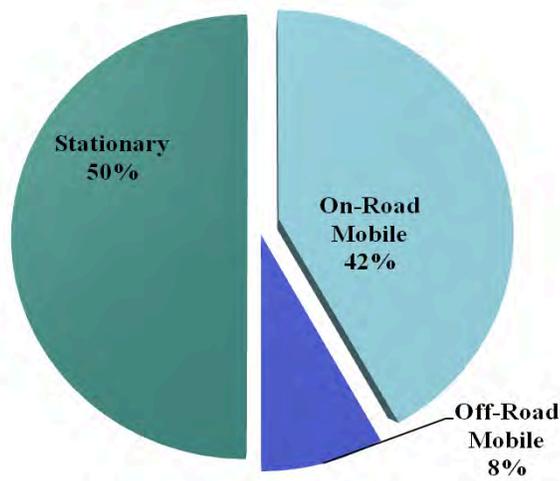
TOTAL= 25 MMT CO₂E

Figure 2
2007 San Bernardino County Inventory



TOTAL= 28 MMT CO₂E

Figure 3
2020 San Bernardino County Inventory



TOTAL= 36 MMT CO₂E

REFERENCES

California Department of Finance. City/County Population and Housing Estimates, Table 2: E-5, January 1, 2007.

CARB, 2006. CARB OFFROAD Model Input Factors.

CARB, 2007. CARB EMFAC2007 Model.

CARB, 2007. CARB OFFROAD Model.

MDAQMD, 2008. Federal 8-Hour Ozone Attainment Plan.

San Bernardino County Department of Agriculture, Weights and Measures. Dairy Information, June 2008.

SCAG, 2004. Regional Transportation Plan.

SCAQMD, 2007. 2007 Air Quality Management Plan Appendix IV: District's Stationary and Mobile Source Control Measures.

SCAQMD, 2007. 2007 Air Quality Management Plan Appendix III; Base and Future Year Emission Inventories.

SCAQMD, 2007. 2007 Air Quality Management Plan.

U.S. EPA, 1998, Fifth Edition, Volume 1, Chapter 44: Greenhouse Gas Biogenic Sources 14.4 Enteric Fermentation – Greenhouse Gases, Supplement D., February 1998.

U.S. EPA, AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, January 1995.

U.S. EPA, Methods for Estimating Greenhouse Gas Emissions for Livestock Manure Management, Livestock Manure Management (March 2005) Draft.

APPENDIX A
GHG Emissions per Major Source Categories

Table A-1, 1990 GHG Emissions Per Major Source Category For San Bernardino County

CODE	Source Category	Emissions (TPY)			MMT
		CO ₂	N ₂ O	CH ₄	CO ₂ E7
Fuel Combustion					
10	Electric Utilities	3,629,749	22	158	3
20	Cogeneration	1,751,372	28	187	2
30	Oil and Gas Production (Combustion)	2,087	0	0	0
40	Petroleum Refining (Combustion)	0	0	0	0
50	Manufacturing and Industrial	1,841,904	5	37	2
52	Food and Agricultural Processing	29,040	0	1	0
60	Service and Commercial	5,158,079	20	125	5
99	Other (Fuel Combustion)	198,642	1	8	0
Total Fuel Combustion		12,610,872	76	517	12
Waste Disposal					
110	Sewage Treatment	151,342	0	3	0
120	Landfills	625,649	1	11,026	1
130	Incineration	14,724	0	8	0
199	Other (Waste Disposal)	0	0	6,884	0
Total Waste Disposal		791,715	1	17,921	1
Cleaning and Surface Coatings					
210	Laundering	0	0	0	0
220	Degreasing	0	0	0	0
230	Coatings and Related Processes	2,589	0	52	0
240	Printing	0	0	0	0
250	Adhesives and Sealants	0	0	0	0
299	Other (Cleaning and Surface Coatings)	0	0	5	0
Total Cleaning and Surface Coatings		2,589	0	56	0
Petroleum Production and Marketing					
310	Oil and Gas Production	0	0	0	0
320	Petroleum Refining	0	0	0	0
330	Petroleum Marketing	0	0	1,866	0
399	Other (Petroleum Production and Marketing)	0	0	0	0
Total Petroleum Production and Marketing		0	0	1,866	0
Industrial Processes					
410	Chemical	0	0	33	0
420	Food and Agriculture	0	0	1	0
430	Mineral Processes	11,390	0	87	0
440	Metal Processes	0	0	0	0
450	Wood and Paper	0	0	0	0
460	Glass and Related Products	0	0	0	0
470	Electronics	0	0	0	0
499	Other (Industrial Processes)	0	0	10	0
Total Industrial Processes		11,390	0	131	0
Solvent Evaporation					
510	Consumer Products	0	0	0	0
520	Architectural Coatings and Related Solvent	0	0	0	0
530	Pesticides/Fertilizers	0	0	0	0
540	Asphalt Paving/Roofing	0	0	6	0

$$7 \text{ MMTCO}_2\text{E} = [\text{CO}_2 \text{ (TPY)} \times 1 + \text{N}_2\text{O (TPY)} \times 310 + \text{CH}_4 \text{ (TPY)} \times 21] \times 0.9072/1,000,000$$

Total Solvent Evaporation		0	0	6	0
Miscellaneous Processes					
610 Residential Fuel Combustion	2,125,406	4	36	2	
620 Farming Operations	0	67	52,668	1	
630 Construction and Demolition	0	0	0	0	
640 Paved Road Dust	0	0	0	0	
645 Unpaved Road Dust	0	0	0	0	
650 Fugitive Windblown Dust	0	0	0	0	
660 Fires	0	0	5	0	
670 Waste Burning and Disposal	2,887	9	67	0	
680 Utility Equipment	0	0	0	0	
690 Cooking	0	0	77	0	
699 Other (Miscellaneous Processes	0	0	0	0	
Total Miscellaneous Processes	2,128,293	80	52,853	3	
On-Road Motor Vehicles					
710 Light Duty Passenger Auto (LDA)	2,836,050	428	1135	3	
722 Light Duty Trucks 1 (T1 : up to 3750 lb.)	777,450	171	405	1	
723 Light Duty Trucks 2 (T2 : 3751-5750 lb.)	1,076,750	245	427	1	
724 Medium Duty Trucks (T3 : 5751-8500 lb.)	350,400	55	131	0	
732 Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	354,050	36	161	0	
733 Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	105,850	10	66	0	
734 Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	73,000	5	131	0	
736 Heavy Heavy Duty Gas Trucks ((HHDGT > 33000 lb.)	25,550	3	40	0	
742 Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	7,300	0	0	0	
743 Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	29,200	0	0	0	
744 Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	222,650	1	4	0	
746 Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	2,343,300	6	172	2	
750 Motorcycles (MCY)	14,600	11	62	0	
760 Diesel Urban Buses (UB)	18,250	0	0	0	
762 Gas Urban Buses (UB)	3,650	0	0	0	
770 School Buses (SB)	21,900	0	4	0	
776 Other Buses (OB)	7,300	0	4	0	
780 Motor Homes (MH)	40,150	3	15	0	
Total On-Road Motor Vehicles	8,307,400	977	2,756	8	
Other Mobile Sources					
810 Aircraft	233,779	2	10	0	
820 Trains	606,400	15	47	1	
830 Ships and Commercial Boats	0	0	0	0	
840 Recreational Boats	95,353	22	412	0	
850 Off-Road Recreational Vehicles	7012	11	99	0	
860 Off-Road Equipment	488,440	33	423	0	
870 Farm Equipment	56,703	0	18	0	
890 Fuel Storage and Handling	0	0	0	0	
895 Truck Stops	0	0	0	0	
Total Other Mobile Sources	1,487,685	83	1,010	1	
Total Stationary Sources	15,544,859	158	73,351	16	
Total On-Road Vehicles	8,307,400	977	2,756	8	
Total Other Mobile	1,487,685	83	1,010	1	
Total Anthropogenic	25,339,944	1,218	77,117	25	

Table A-2, 2002 GHG Emissions Per Major Source Category For San Bernardino County

CODE	Source Category	Emissions (TPY)			MMT
		CO ₂	N ₂ O	CH ₄	CO ₂ E
Fuel Combustion					
10	Electric Utilities	3,213,931	21	151	3
20	Cogeneration	1,784,526	28	188	2
30	Oil and Gas Production (Combustion)	2,087	0	0	0
40	Petroleum Refining (Combustion)	0	0	0	0
50	Manufacturing and Industrial	2,692,610	7	53	2
52	Food and Agricultural Processing	32,099	0	1	0
60	Service and Commercial	3,814,762	12	84	4
99	Other (Fuel Combustion)	186,028	1	8	0
Total Fuel Combustion		11,726,042	70	485	11
Waste Disposal					
110	Sewage Treatment	96,116	0	2	0
120	Landfills	838,672	1	6,874	1
130	Incineration	29,791	0	10	0
199	Other (Waste Disposal)	0	0	8,274	0
Total Waste Disposal		964,578	2	15,160	1
Cleaning and Surface Coatings					
210	Laundering	0	0	0	0
220	Degreasing	0	0	0	0
230	Coatings and Related Processes	4,655	0	52	0
240	Printing	0	0	0	0
250	Adhesives and Sealants	0	0	0	0
299	Other (Cleaning and Surface Coatings)	0	0	10	0
Total Cleaning and Surface Coatings		4,655	0	62	0
Petroleum Production and Marketing					
310	Oil and Gas Production	0	0	0	0
320	Petroleum Refining	0	0	0	0
330	Petroleum Marketing	0	0	2,015	0
399	Other (Petroleum Production and Marketing)	0	0	0	0
Total Petroleum Production and Marketing		0	0	2016	0
Industrial Processes					
410	Chemical	0	0	67	0
420	Food and Agriculture	0	0	2	0
430	Mineral Processes	21,635	0	110	0
440	Metal Processes	0	0	0	0
450	Wood and Paper	0	0	0	0
460	Glass and Related Products	0	0	0	0
470	Electronics	0	0	0	0
499	Other (Industrial Processes)	0	0	16	0
Total Industrial Processes		21,635	0	194	0
Solvent Evaporation					
510	Consumer Products	0	0	0	0
520	Architectural Coatings and Related Solvent	0	0	0	0

530	Pesticides/Fertilizers	0	0	0	0
540	Asphalt Paving/Roofing	0	0	6	0
Total Solvent Evaporation		0	0	6	0
Miscellaneous Processes					
610	Residential Fuel Combustion	1,518,936	3	26	1
620	Farming Operations	0	22	17,011	0
630	Construction and Demolition	0	0	0	0
640	Paved Road Dust	0	0	0	0
645	Unpaved Road Dust	0	0	0	0
650	Fugitive Windblown Dust	0	0	0	0
660	Fires	0	0	6	0
670	Waste Burning and Disposal	16,498	49	56	0
680	Utility Equipment	0	0	0	0
690	Cooking	0	0	107	0
699	Other (Miscellaneous Processes)	0	0	0	0
Total Miscellaneous Processes		1,535,434	74	17,206	2
On-Road Motor Vehicles					
710	Light Duty Passenger Auto (LDA)	3,580,650	219	624	3
722	Light Duty Trucks 1 (T1 : up to 3750 lb.)	1,182,600	157	175	1
723	Light Duty Trucks 2 (T2 : 3751-5750 lb.)	1,755,650	271	285	2
724	Medium Duty Trucks (T3 : 5751-8500 lb.)	1,069,450	109	146	1
732	Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	197,100	26	40	0
733	Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	47,450	6	11	0
734	Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	32,850	5	22	0
736	Heavy Heavy Duty Gas Trucks ((HHDGT > 33000 lb.)	21,900	4	15	0
742	Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	3,650	0	4	0
743	Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	32,850	0	0	0
744	Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	313,900	1	4	0
746	Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	2,445,500	6	106	2
750	Motorcycles (MCY)	10,950	7	29	0
760	Diesel Urban Buses (UB)	21,900	0	0	0
762	Gas Urban Buses (UB)	7,300	1	0	0
770	School Buses (SB)	36,500	0	0	0
776	Other Buses (OB)	10,950	1	4	0
780	Motor Homes (MH)	47,450	6	7	0
Total On-Road Motor Vehicles		10,818,600	818	1,471	10
Other Mobile Sources					
810	Aircraft	197,782	2	8	0
820	Trains	825,780	21	65	1
830	Ships and Commercial Boats	0	0	0	0
840	Recreational Boats	117,413	29	285	0
850	Off-Road Recreational Vehicles	8,979	18	58	0
860	Off-Road Equipment	643,510	37	274	1
870	Farm Equipment	55,955	0	15	0
890	Fuel Storage and Handling	0	0	0	0
895	Truck Stops	0	0	0	0
Total Other Mobile Sources		1,849,418	106	705	2
Total Stationary Sources		14,252,345	146	35,129	14
Total On-Road Vehicles		10,818,600	818	1,471	10
Total Other Mobile		1,849,418	106	705	2
Total Anthropogenic		26,920,364	1,071	37,305	25

Table A-3, 2007 GHG Emissions Per Major Source Category For San Bernardino County

CODE	Source Category	Emissions (TPY)			MMT
		CO ₂	N ₂ O	CH ₄	CO ₂ E
Fuel Combustion					
10	Electric Utilities	3,983,087	23	165	4
20	Cogeneration	1,802,031	28	189	2
30	Oil and Gas Production (Combustion)	2,087	0	0	0
40	Petroleum Refining (Combustion)	0	0	0	0
50	Manufacturing and Industrial	3,129,100	8	61	3
52	Food and Agricultural Processing	36,285	0	1	0
60	Service and Commercial	3,816,449	12	81	4
99	Other (Fuel Combustion)	187,158	1	8	0
Total Fuel Combustion		12,956,195	72	504	12
Waste Disposal					
110	Sewage Treatment	91,015	0	2	0
120	Landfills	997,181	2	7,633	1
130	Incineration	40,267	0	11	0
199	Other (Waste Disposal)	0	0	9,358	0
Total Waste Disposal		1,128,463	2	17,005	1
Cleaning and Surface Coatings					
210	Laundering	0	0	0	0
220	Degreasing	0	0	0	0
230	Coatings and Related Processes	6,973	0	61	0
240	Printing	0	0	0	0
250	Adhesives and Sealants	0	0	0	0
299	Other (Cleaning and Surface Coatings)	0	0	14	0
Total Cleaning and Surface Coatings		6,973	0	75	0
Petroleum Production and Marketing					
310	Oil and Gas Production	0	0	0	0
320	Petroleum Refining	0	0	0	0
330	Petroleum Marketing	0	0	2,026	0
399	Other (Petroleum Production and Marketing)	0	0	0	0
Total Petroleum Production and Marketing		0	0	2,026	0
Industrial Processes					
410	Chemical	0	0	99	0
420	Food and Agriculture	0	0	2	0
430	Mineral Processes	29,842	0	118	0
440	Metal Processes	0	0	0	0
450	Wood and Paper	0	0	0	0
460	Glass and Related Products	0	0	0	0
470	Electronics	0	0	0	0
499	Other (Industrial Processes)	0	0	17	0
Total Industrial Processes		29,842	0	236	0
Solvent Evaporation					
510	Consumer Products	0	0	0	0
520	Architectural Coatings and Related Solvent	0	0	0	0
530	Pesticides/Fertilizers	0	0	0	0

540	Asphalt Paving/Roofing	0	0	7	0
Total Solvent Evaporation		0	0	7	0
Miscellaneous Processes					
610	Residential Fuel Combustion	1,540,926	3	26	1
620	Farming Operations	0	15	11,793	0
630	Construction and Demolition	0	0	0	0
640	Paved Road Dust	0	0	0	0
645	Unpaved Road Dust	0	0	0	0
650	Fugitive Windblown Dust	0	0	0	0
660	Fires	0	0	6	0
670	Waste Burning and Disposal	255,207	765	91	0
680	Utility Equipment	0	0	0	0
690	Cooking	0	0	119	0
699	Other (Miscellaneous Processes)	0	0	0	0
Total Miscellaneous Processes		1,796,133	783	12,035	2
On-Road Motor Vehicles					
710	Light Duty Passenger Auto (LDA)	3,686,500	247	391	3
722	Light Duty Trucks 1 (T1 : up to 3750 lb.)	1,036,600	97	110	1
723	Light Duty Trucks 2 (T2 : 3751-5750 lb.)	2,164,450	189	208	2
724	Medium Duty Trucks (T3 : 5751-8500 lb.)	1,547,600	84	128	1
732	Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	237,250	14	22	0
733	Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	47,450	3	4	0
734	Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	29,200	3	11	0
736	Heavy Heavy Duty Gas Trucks ((HHDGT > 33000 lb.)	14,600	2	11	0
742	Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	62,050	0	0	0
743	Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	40,150	0	4	0
744	Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	386,900	1	4	0
746	Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	2,748,450	7	102	2
750	Motorcycles (MCY)	29,200	16	66	0
760	Diesel Urban Buses (UB)	18,250	0	0	0
762	Gas Urban Buses (UB)	10,950	1	0	0
770	School Buses (SB)	43,800	0	0	0
776	Other Buses (OB)	14,600	1	4	0
780	Motor Homes (MH)	58,400	6	4	0
Total On-Road Motor Vehicles		12,176,400	672	1,066	11
Other Mobile Sources					
810	Aircraft	238,344	2	10	0
820	Trains	920,958	23	72	1
830	Ships and Commercial Boats	0	0	0	0
840	Recreational Boats	143,843	37	237	0
850	Off-Road Recreational Vehicles	11,279	22	77	0
860	Off-Road Equipment	704,410	40	219	1
870	Farm Equipment	54,546	0	11	0
890	Fuel Storage and Handling	0	0	0	0
895	Truck Stops	0	0	0	0
Total Other Mobile Sources		2,073,379	124	626	2
Total Stationary Sources		15,917,605	857	31,888	15
Total On-Road Vehicles		12,176,400	672	1,066	11
Total Other Mobile		2,073,379	124	626	2
Total Anthropogenic		30,167,385	1,653	33,580	28

Table A-4, 2020 GHG Emissions Per Major Source Category For San Bernardino County

CODE	Source Category	Emissions (TPY)			MMT
		CO ₂	N ₂ O	CH ₄	CO ₂ E
Fuel Combustion					
10	Electric Utilities	4,955,987	24	181	5
20	Cogeneration	1,800,825	28	189	2
30	Oil and Gas Production (Combustion)	2,087	0	0	0
40	Petroleum Refining (Combustion)	0	0	0	0
50	Manufacturing and Industrial	4,085,956	10	78	4
52	Food and Agricultural Processing	46,801	0	1	0
60	Service and Commercial	3,875,062	12	83	4
99	Other (Fuel Combustion)	191,502	1	8	0
Total Fuel Combustion		14,958,220	76	540	14
Waste Disposal					
110	Sewage Treatment	114,895	0	2	0
120	Landfills	1,357,810	2	9,417	1
130	Incineration	61,969	0	15	0
199	Other (Waste Disposal)	0	0	11,187	0
Total Waste Disposal		1,534,674	3	20,622	2
Cleaning and Surface Coatings					
210	Laundering	0	0	0	0
220	Degreasing	0	0	0	0
230	Coatings and Related Processes	10,709	0	84	0
240	Printing	0	0	0	0
250	Adhesives and Sealants	0	0	0	0
299	Other (Cleaning and Surface Coatings)	0	0	22	0
Total Cleaning and Surface Coatings		10,709	0	106	0
Petroleum Production and Marketing					
310	Oil and Gas Production	0	0	0	0
320	Petroleum Refining	0	0	0	0
330	Petroleum Marketing	0	0	2,058	0
399	Other (Petroleum Production and Marketing)	0	0	0	0
Total Petroleum Production and Marketing		0	0	2,059	0
Industrial Processes					
410	Chemical	0	0	166	0
420	Food and Agriculture	0	0	2	0
430	Mineral Processes	46,989	0	149	0
440	Metal Processes	0	0	0	0
450	Wood and Paper	0	0	0	0
460	Glass and Related Products	0	0	0	0
470	Electronics	0	0	0	0
499	Other (Industrial Processes)	0	0	24	0
Total Industrial Processes		46,989	0	341	0
Solvent Evaporation					
510	Consumer Products	0	0	0	0
520	Architectural Coatings and Related Solvent	0	0	0	0
530	Pesticides/Fertilizers	0	0	0	0

540	Asphalt Paving/Roofing	0	0	9	0
Total Solvent Evaporation		0	0	9	0
Miscellaneous Processes					
610	Residential Fuel Combustion	2,050,359	4	35	2
620	Farming Operations	0	9	6,957	0
630	Construction and Demolition	0	0	0	0
640	Paved Road Dust	0	0	0	0
645	Unpaved Road Dust	0	0	0	0
650	Fugitive Windblown Dust	0	0	0	0
660	Fires	0	0	6	0
670	Waste Burning and Disposal	255,207	765	81	0
680	Utility Equipment	0	0	0	0
690	Cooking	0	0	150	0
699	Other (Miscellaneous Processes)	0	0	0	0
Total Miscellaneous Processes		2,305,566	778	7,229	2
On-Road Motor Vehicles					
710	Light Duty Passenger Auto (LDA)	4,602,650	129	150	4
722	Light Duty Trucks 1 (T1 : up to 3750 lb.)	1,339,550	51	47	1
723	Light Duty Trucks 2 (T2 : 3751-5750 lb.)	2,810,500	101	120	3
724	Medium Duty Trucks (T3 : 5751-8500 lb.)	1,971,000	49	77	2
732	Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	357,700	8	11	0
733	Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	76,650	2	4	0
734	Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	47,450	2	4	0
736	Heavy Heavy Duty Gas Trucks ((HHDGT > 33000 lb.)	21,900	1	4	0
742	Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	69,350	0	4	0
743	Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	51,100	0	0	0
744	Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	525,600	2	0	0
746	Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	4,288,750	11	47	4
750	Motorcycles (MCY)	54,750	20	77	0
760	Diesel Urban Buses (UB)	25,550	0	0	0
762	Gas Urban Buses (UB)	10,950	1	0	0
770	School Buses (SB)	58,400	0	0	0
776	Other Buses (OB)	21,900	0	0	0
780	Motor Homes (MH)	83,950	4	0	0
Total On-Road Motor Vehicles		16,417,700	381	544	15
Other Mobile Sources					
810	Aircraft	573,241	5	24	1
820	Trains	1,143,196	29	89	1
830	Ships and Commercial Boats	0	0	0	0
840	Recreational Boats	225,110	47	146	0
850	Off-Road Recreational Vehicles	17,991	37	120	0
860	Off-Road Equipment	871,085	40	135	1
870	Farm Equipment	50,921	0	4	0
890	Fuel Storage and Handling	0	0	0	0
895	Truck Stops	0	0	0	0
Total Other Mobile Sources		2,881,544	158	519	3
Total Stationary Sources		18,856,158	856	30,905	18
Total On-Road Vehicles		16,417,700	381	544	15
Total Other Mobile		2,881,544	158	519	3
Total Anthropogenic		38,155,402	1,395	31,967	36

Table A-5, 2002 Daily Fuel Consumption Per Major Source Category For San Bernardino County

CODE	Source Category	Natural Gas (mmscf)	LPG/ Propane/ Butane (1000 gal)	Diesel/ Distillate Oil (1000 gal)	Gasoline (1000 gal)	Landfill Gas (mmscf)	Digester Gas (mmscf)	Residual Fuel Oil (1000 gal)	Jet Fuel (1000 gal)	Bituminous (Tons)	CNG (1000 gal)
Fuel Combustion											
10	Electric Utilities	103.39	0.00	0.03	0.00	0.00	0.03	0.00	0.00	1071.17	0.00
20	Cogeneration	14.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1744.53	0.00
30	Oil and Gas Production (Combustion)	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00
40	Petroleum Refining (Combustion)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	Manufacturing and Industrial	103.63	40.67	67.28	0.11	0.00	0.00	0.41	0.00	0.00	0.00
52	Food and Agricultural Processing	1.32	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	Service and Commercial	131.07	39.27	166.13	27.06	0.00	0.73	0.00	1.01	0.00	0.00
99	Other (Fuel Combustion)	0.00	0.00	38.09	0.00	1.32	1.25	0.00	0.00	0.00	0.00
	Total Fuel Combustion	353.81	79.94	272.12	27.76	1.32	2.01	0.41	1.01	2815.70	0.00
Waste Disposal											
110	Sewage Treatment	0.00	0.00	0.04	0.00	0.00	6.92	0.00	0.00	0.00	0.00
120	Landfills	0.00	0.00	0.00	0.00	83.38	0.00	0.00	0.00	0.00	0.00
130	Incineration	1.28	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
199	Other (Waste Disposal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Waste Disposal	1.28	0.00	0.04	0.00	83.38	6.99	0.00	0.00	0.00	0.00
Cleaning and Surface Coatings											
210	Laundry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
220	Degreasing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	Coatings and Related Processes	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	Printing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250	Adhesives and Sealants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	Other (Cleaning and Surface Coatings)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Cleaning and Surface Coatings	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petroleum Production and Marketing											
310	Oil and Gas Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

330	Petroleum Marketing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
399	Other (Petroleum Production and Marketing)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Petroleum Production and Marketing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Industrial Processes																		
410	Chemical	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420	Food and Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
430	Mineral Processes	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450	Wood and Paper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
460	Glass and Related Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470	Electronics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
499	Other (Industrial Processes)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Industrial Processes	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Solvent Evaporation																		
510	Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520	Architectural Coatings and Related Solvent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530	Pesticides/Fertilizers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
540	Asphalt Paving/Roofing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Solvent Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Miscellaneous Processes																		
610	Residential Fuel Combustion	66.94	7.10	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
620	Farming Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
640	Paved Road Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
645	Unpaved Road Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
650	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
660	Fires	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
670	Waste Burning and Disposal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
680	Utility Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
690	Cooking	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
699	Other (Miscellaneous Processes)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Miscellaneous Processes	66.94	7.10	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	On-Road Motor Vehicles																		
710	Light Duty Passenger Auto (LDA)	0.00	0.00	2.94	1036.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
722	Light Duty Trucks 1 (T1 : up to 3750 lb.)	0.00	0.00	13.05	330.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

723	Light Duty Trucks 2 (T2 : 3751-5750 lb.)	0.00	0.00	1.71	507.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
724	Medium Duty Trucks (T3 : 5751-8500 lb.)	0.00	0.00	0.83	307.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
732	Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	0.00	0.00		59.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
733	Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	0.00	0.00		14.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
734	Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	0.00	0.00		10.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
736	Heavy Heavy Duty Gas Trucks (HHDDGT > 33000 lb.)	0.00	0.00		8.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
742	Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	0.00	0.00	0.74		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
743	Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	0.00	0.00	7.94		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
744	Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	0.00	0.00	77.50		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
746	Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	0.00	0.00	602.82		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles (MCY)	0.00	0.00	0.00	6.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
760	Diesel Urban Buses (UB)	0.00	0.00	5.81		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
762	Gas Urban Buses (UB)	0.00	0.00	0.00	2.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
770	School Buses (SB)	0.00	0.00	8.55	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
776	Other Buses (OB)	0.00	0.00	1.79	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
780	Motor Homes (MH)	0.00	0.00	1.47	12.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total On-Road Motor Vehicles	0.00	0.00	725.15	2,299.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Other Mobile Sources													
810	Aircraft	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820	Trains	0.00	0.00	201.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
830	Ships and Commercial Boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
840	Recreational Boats	0.00	0.00	0.92	47.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
850	Off-Road Recreational Vehicles	0.00	0.00	0.00	5.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
860	Off-Road Equipment	0.00	0.00	143.94	24.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.34
870	Farm Equipment	0.00	0.00	13.81	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
890	Fuel Storage and Handling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
895	Truck Stops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Other Mobile Sources	0.00	0.00	360.07	77.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.34
	Total Stationary Sources	423.21	87.04	272.88	27.76	84.70	9.00	0.41	1.01	2815.70	0.00	0.00	0.00	0.00
	Total On-Road Vehicles	0.00	0.00	725.15	2299.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Other Mobile*	0.00	0.00	360.07	77.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.34
	Total Anthropogenic	423.21	87.04	1,358.10	2,404.62	84.70	9.00	0.41	52.18	2,815.70	0.00	0.00	0.00	9.34

APPENDIX B

GHG EMISSIONS FROM ELECTRICITY USAGE

Table B-1
1996 San Bernardino County GHG Emissions from Electricity Usage*

Emissions from Electricity Usage are derived from the following equation:

$$\text{Emissions}_{(\text{elec})} (\text{TPY}) = ((\text{Annual Consumption} \times \text{Emission Factor})/2000^*)$$

To convert from TPY to Million Metric Tons (MMT multiply TPY by (0.9072/1,000,000))

	Annual Electrical Consumption (MWh)	Emission Factor**			CO ₂ TPY	CH ₄ TPY	N ₂ O TPY	CO ₂ E MMT***
		CO ₂ lbs/MWh	CH ₄ lbs/MWh	N ₂ O lbs/MWh				
Residential	3,537,000	640	0.0067	0.0037	1,131,840	11.85	6.54	1.03
Non-Residential	6,822,000				2,183,040	22.85	12.62	1.98
Total	10,359,000				3,314,880	34.70	19.16	3.01

*The activity data was provided by the San Bernardino County (Obtained from the California Energy Commission)

**Emission Factor for electricity usage as reported to California Climate Action Registry for Southern California Edison.

***CO₂ equivalent conversion factors are from Table 2 of CARB's regulation for Mandatory Reporting of GHG emissions.

Table B-2
2005 San Bernardino County GHG Emissions from Electricity Usage

Emissions from Electricity Usage are derived from the following equation:

$$\text{Emissions}_{(\text{elec})} (\text{TPY}) = ((\text{Annual Consumption} \times \text{Emissions Factor})/2000^*)$$

To convert from TPY to Million Metric Tons (MMT multiply TPY by (0.9072/1,000,000))

	Annual Electrical Consumption (MWh)	Emission Factor**			CO ₂ TPY	CH ₄ TPY	N ₂ O TPY	CO ₂ E MMT***
		CO ₂ lbs/MWh	CH ₄ lbs/MWh	N ₂ O lbs/MWh				
Residential	5,208,000	640	0.0067	0.0037	1,666,560	17.45	9.63	1.51
Non-Residential	9,551,000				3,056,320	32.00	17.67	2.78
Total	14,759,000				4,722,880	49.44	27.30	4.29

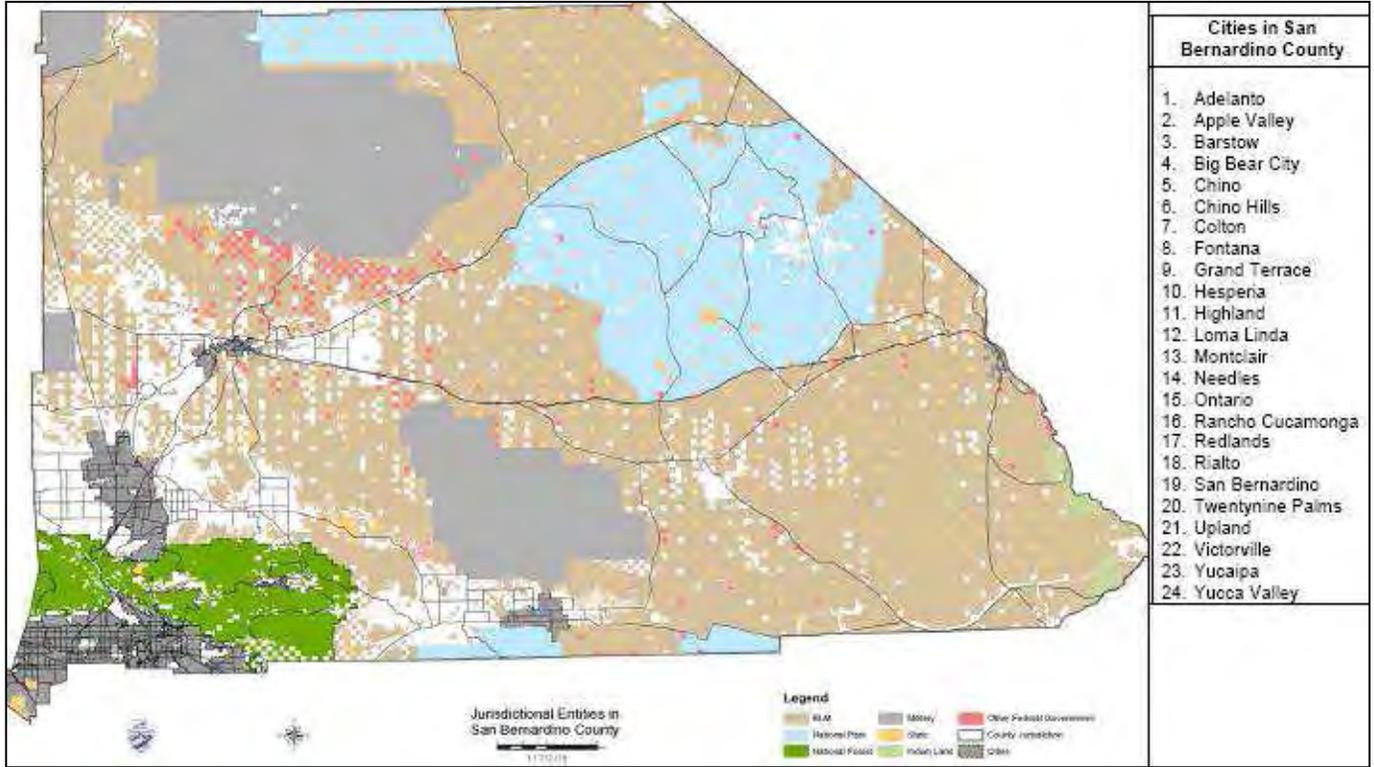
*The activity data was provided by the San Bernardino County

**Emission Factor for electricity usage as reported to California Climate Action Registry for Southern California Edison.

***CO₂ equivalent conversion factors are from Table 2 of CARB's regulation for Mandatory Reporting of GHG emissions.

APPENDIX C

Figure C-1, San Bernardino County Land Use Map



Source: San Bernardino County Land Use Services Department, 2009

APPENDIX D

DAIRY, MANURE AND DIGESTIVE METHANE INVENTORY DOCUMENTATION

Table D-1
1990 San Bernardino County Dairy GHG Emissions Summary*

Total Milk Cows	Total Calves	Total Acres	Total Methane Emissions (MT/yr)	Total N ₂ O Emissions (MT/yr)	CO ₂ E (MT/yr)
188,000	152,000	5,425	41,562.0	52.9	889,192

*The data was provided by the San Bernardino County Department of Agriculture, Weights and Measures, June 2008

**Table D-2
1990 San Bernardino County Dairy GHG Manure Methane Emissions**

Animal	Head	Typical Animal Mass* (lbs)	Total Animal Mass (kg)	kg VS**/1000 kg Animal Mass/day	Total VS Produced (kg/yr)	Max. Methane Produced per kg of VS (m3/kg)	Methane Conversion Factor	Total Annual Methane Emissions (m3/yr)	Total Annual Methane Emissions (MT/yr)	Methane (lbs/day)	CO ₂ E (MT/yr)
Milk Cows	160,000	1,400	101,605,733	9.44	350,092,715	0.24	0.51	42,683,304	28,256.4	154,829	593,383
Dry Cows	28,000	1,120	14,224,803	6.82	35,409,801	0.17	0.02	108,354	71.7	393	1,506
Heifers (1-2 yrs)	76,000	1,003	34,576,794	6.41	80,897,596	0.17	0.02	247,547	163.9	898	3,441
Calves (3 mos-1 yr)	57,000	500	12,927,515	6.41	30,245,861	0.17	0.02	92,552	61.3	336	12,867
Calves (<3 mos)	19,000	300	2,585,503	6.41	6,049,172	0.17	0.02	18,510	12.3	67	257
TOTALS***	340,000		165,920,348		502,695,145			43,150,267	28,565.5	156,523	599,875

*Typical Animal Mass from Dairy Technical Report

**Volatile Solids

***In total (#s may be slightly off due to rounding)

Source: EPA Methods for Estimating Greenhouse Gas Emissions from Livestock Manure Management (2005).

Table D-3
1990 San Bernardino County Digestive Methane Emissions

Animal	Head	Digestive Methane Emission Factor (lbs/cow/yr)	Digestive Methane Emissions (lbs/yr)	Digestive Methane Emissions (MT/yr)	Methane (lbs/day)
Milk Cows	160,000	119.10	19,056,000	8,662	52,208
Dry Cows	28,000	119.10	3,334,800	1,516	9,136
Heifers (1-2 yrs)	76,000	61.00	4,636,000	2,107	12,701
Calves (3 mos-1 yr)	57,000	20.60	1,174,200	534	3,217
Calves (<3 mos)	19,000	20.60	391,400	178	1,072
TOTALS	340,000		28,592,400	12,997	78,335
				Total Methane Emissions (MT/yr) (Manure + Digestive)	41,562
				Total CO ₂ E (MT/yr)	872,802

Source: EPA 1998. AP-42, Fifth Edition, Volume I, Chapter 44: Greenhouse Gas Biogenic Sources 14.4 Enteric Fermentation – Greenhouse Gases, Supplement D., February 1998.

**Table D-4
1990 San Bernardino County N₂O Emissions from Manure Management**

Liquid System

Animal	Head	Factor	Typical Animal Mass (lbs)	Liquid Waste Factor	Liquid Waste Nitrogen (lbs/yr)	Liquid Waste Nitrogen (kg/yr)	Emission Factor (kg N ₂ O-N/kg N)	N ₂ O Emissions (N ₂ O-N/kg N)	N ₂ O (MT/yr)	N ₂ O (lbs/day)
Milk Cows	160,000	1.40	224,000	40.88	9,157,120	4,153,642	0.00	4,153.6	4.6	25
Dry Cows	28,000	1.12	31,360	24.64	772,632	350,464	0.00	350.5	0.4	2
Heifers (1-2 yrs)	76,000	1.03	78,280	24.64	1,928,623.5	874,818	0.00	874.8	1.0	5
Calves (3 mos-1 yr)	57,000	0.50	28,500	24.64	702,168.75	318,502	0.00	318.5	0.4	2
Calves (<3 mos)	19,000	0.30	5,700	24.64	140,433.75	63,700	0.00	63.7	0.1	0.4
Subtotal Liquid*	340,000				12,700,978	5,761,126		5,761.1	6.5	34.4

Dry System

Animal	Head	Factor	Typical Animal Mass (lbs)	Solid Waste Factor	Solid Waste Nitrogen (lbs/yr)	Solid Waste Nitrogen (kg/yr)	Emission Factor (kg N ₂ O-N/kg N)	N ₂ O Emissions (N ₂ O-N/kg N)	N ₂ O (MT/yr)	N ₂ O (lbs/day)
Milk Cows	160,000	1.40	224,000	10	9,157,120	4,153,642	0.02	20,768	22.9	125
Dry Cows	28,000	1.12	31,360	16	772,632	350,464	0.02	4,673	5.2	28
Heifers (1-2 yrs)	76,000	1.03	78,280	16	1,928,623.5	874,818	0.02	11,664	12.9	70
Calves (3 mos-1 yr)	57,000	0.50	28,500	16	702,168.75	318,502	0.02	4,247	4.7	26
Calves (<3 mos)	19,000	0.30	5,700	16	140,433.75	63,700	0.02	849	1.0	5
Subtotal Dry*	340,000				12,700,978	5,761,126		42,201	46.5	254
Total Dry & Liquid System*								47,963	53	288

*Numbers in totals may be off slightly due to rounding

Sources:

Liquid & solid waste factors and resulting liquid & solid waste nitrogen from SJVAPCD Dairy Technical Report

Emission factor (kg N₂O-N/kg N): EPA, Methods for Estimating Greenhouse Gas Emissions from Livestock Manure Management (March 2005) DRA

APPENDIX E

POPULATION AND EMPLOYMENT DATA

Table E-1 summarizes population and employment data used to project energy use in this analysis. All the socioeconomic data were provided by SCAG and used in the 2007 AQMP.

Table E-1

San Bernardino County Population and Employment Data

	1990	2002	2007	2020
Population	1,418,380	1,785,347	2,056,450	2,533,956
Employment	444,128	614,505	729,470	1,002,376

Table E-2 Summarizes Population Data for Areas under County's Jurisdiction

Table E-2

Population Data for Areas under County's Jurisdiction

	1990	2002	2007	2020
Population	207,083	260,661	300,242	369,958

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APPENDIX E

A LOOK FORWARD TO 2030

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APPENDIX E

REDUCING SAN BERNARDINO COUNTY'S EMISSIONS FURTHER:

A LOOK FORWARD TO 2030

PREPARED BY ICF INTERNATIONAL

In order to assess whether implementing this plan achieves the State's long-term climate goals, one must look beyond 2020 to see whether the emissions reduction measures set the County on a trajectory needed to do its part. Governor Schwarzenegger's Executive Order S-3-05 calls for an 80 percent reduction below 1990 greenhouse gas emission levels by 2050. This results in a 2050 statewide target of about 85 million metric tons of carbon dioxide equivalent (MMTCO₂E) (total emissions), as compared to the 1990 level (also the 2020 target) of 427 MMTCO₂E. Assuming that San Bernardino County's 2020 goal of 15% below 2007 levels (equal to 5.2 MMTCO₂E) is roughly equivalent to 1990 levels, the 2050 County goal to match the S-3-05 goals would be 1.1 MMTCO₂E in 2050.

Full implementation of CARB's Scoping Plan and the County's GHG Reduction Plan will put the County on a path toward these required long-term reductions. Figure E-1 depicts what an emissions trajectory might look like, assuming San Bernardino County follows a linear path from the 2020 reduction target to a 2050 goal matching that in S-03-05. While the measures needed to meet the 2050 goal are too far in the future to define in detail, one can examine the measures needed to keep the County on track through at least 2030.

To stay on course toward the 2050 target, the County's greenhouse gas emissions need to be reduced to approximately 3.9 MMTCO₂E by 2030. This translates to an average reduction of 2.7 percent per year between 2020 and 2030. An additional challenge comes from the fact that the population in unincorporated San Bernardino County will grow further between 2020 and 2030. To counteract this trend, per-capita emissions must decrease at an average rate of slightly less than 3.1 percent per year during the 2020 to 2030 period.

These reductions are possible. The measures needed are logical expansions of the programs recommended in the CARB Scoping Plan at the state level and the measures included in the San Bernardino GHG Reduction Plan at the local level that get the County to the 2020 goal.

The State can help San Bernardino County keep on track through 2030 by extending state action in the following ways that it described in the Scoping Plan (CARB 2008):

- Expand vehicle efficiency regulations to achieve a 40 percent fleet-wide passenger vehicle reduction by 2030 (approximately double the almost 20 percent expected in 2020);

-
- Increasing California's use of renewable energy in electricity generation (beyond the 33% planned for 2020);
 - Reducing the carbon intensity of transportation fuels by 25 percent (a further decrease from the 10 percent level set for 2020);
 - Increasing energy efficiency and green building efforts (so that the savings achieved in the 2020 to 2030 timeframe are approximately double those accomplished in 2020); and
 - Using a regional or national cap-and-trade system to further limit emissions from the 85 percent of greenhouse gas emissions in capped sectors (Transportation Fuels and other fuel use, Electricity, Residential/Commercial Natural Gas, and Industry). By 2030 a comprehensive cap-and-trade program could lower emissions in the capped sectors from 365 MMTCO₂E in 2020 to around 250 MMTCO₂E in 2030. The County's GHG Reduction Plan has not assumed any benefit from a cap and trade system 2020, but if and when implemented, such a system would result in reductions beyond that currently anticipated in the Plan for 2020 and additional reductions for 2030;

San Bernardino can do its part to be on track through 2030 to meet the 2050 goal by implementing the following:

- Increasing energy efficiency and green building efforts (for County municipal buildings as well as private buildings in the County) so that the savings achieved in the 2020 to 2030 timeframe are approximately double those accomplished in 2020;
- Continuing to implement land use and transportation measures to lower VMT and shift travel modes (assumed improvement of 10% compared to unmitigated condition which is a mid-point between the SB375 SCAG goal of 8% for 2020 and 12% for 2035);
- Capture more methane from County landfills, move beyond the 75% local waste diversion goal for 2020, and utilize landfill gas further as an energy source.
- Continue to improve local water efficiency and conservation.

The effects of these strategies are presented in Table E-1 and would represent an approximate doubling of effort from that planned at the state and County level for 2020.

In total, the measures described above would produce reductions to bring the County's GHG emissions to an estimated 3.9 MMTCO₂E. While the potential mix of future GHG reduction measures articulated in this section is only an example, it serves to demonstrate that the measures in the CARB Scoping Plan and the County's GHG Reduction Plan can not only move the County to its 2020 goal, but can also provide an expandable framework for much greater long-term greenhouse gas emissions reductions.

This appendix was prepared by Rich Walter, Principal, ICF International and Brian Schuster, Technical Analyst, ICF international.

**Figure E-1: San Bernardino County
GHG Emission and Projections, 1990 to 2050**

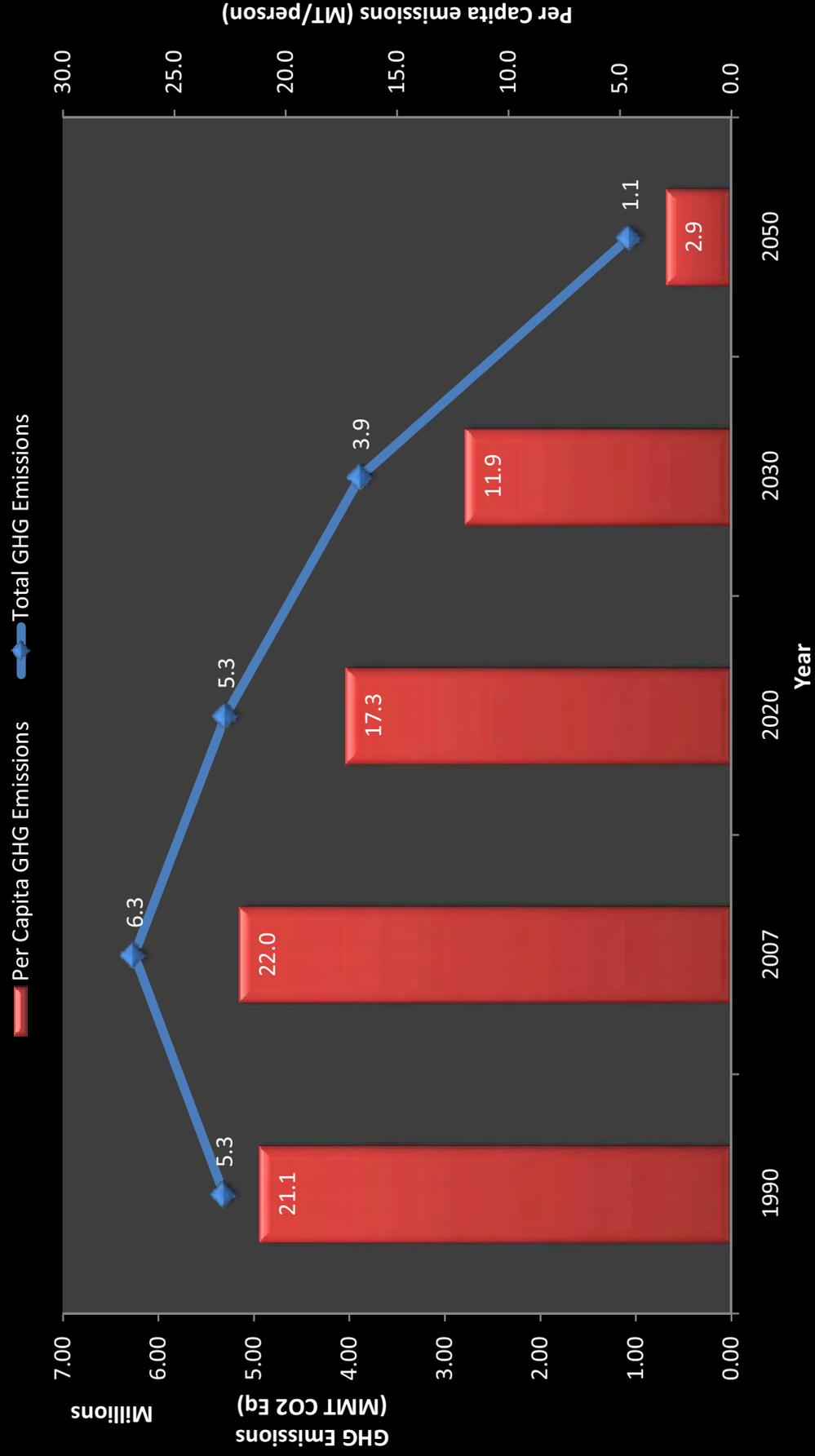


Table E-1: San Bernardino County, 2030 Reduction Scenario										
Scenario	2020 Plan					2030 Scenario				
	Reductions State	Reductions Local	Unmitigated Emissions	Reductions State	Reductions Local	Reductions State	Reductions Local	Total Reductions	Notes	
Stationary Sources	33%	0%	3,649,630	46%	0%	1,678,830	0	1,678,830	Assumed state continues efforts to reduce carbon intensity of cement and other industrial processes (assumed 13% improvement 2020 to 2030 which is a 50% slower rate of improvement than assumed in County GHG reduction plan from 2007 to 2020).	
Residential and Commercial	22%	11%	860,284	45%	20%	387,128	172,057	559,185	CARB Scoping Plan calls for doubling of energy efficiency reductions between 2020 and 2030. Local measure improvements in energy efficiency and use of renewable energy estimates to double reductions in this sector by 2030.	
Industrial	22%	11%	905,392	45%	20%	407,427	181,078	588,505	CARB Scoping Plan calls for achieving twice as much reductions from vehicle fleet by 2020 compared to 2030 and more than doubling reduction of carbon intensity of transportation fuels. Local reduction assumed be between 2020 SCAG goal of 8% and 12% of goal for 2035 for VMT reduction.	
Transportation: On-Road	20%	2%	2,654,879	40%	10%	1,061,951	265,488	1,327,439	CARB Scoping Plan calls for more than double the reduction of carbon intensity of transportation fuels.	
Transportation: Off-Road	7%	0%	307,919	14%	0%	44,340	0	44,340		
Landfill Waste	0%	58%	397,944	0%	65%	0	258,663	258,663	Assumed County continues further efforts at methane control, waste diversion, and potential waste to energy projects to result in 7% further reduction in sector.	
Agriculture	3%	0%	41,813	3%	0%	1,254	0	1,254	No assumed change.	
Wastewater	0%	7%	41,920	0%	10%	0	4,192	4,192	Assumed additional 3% in reduction in sector due to fugitive emission capture and additional water conservation.	
Water Conveyance	15%	20%	15,325	20%	25%	3,065	3,831	6,896	Assumed state continued effort to reduce carbon intensity of cement and other industrial processes (assumed 17% improvement 2020 to 2030).	
Miscellaneous	0%	0%	509	0%	0%	0	0	0	No assumed change.	
Additional Reductions Assumed from Cap and Trade								514,786	CARB Scoping Plan assumed approximately 5.8% of reductions by 2020 in capped sectors not otherwise accounted for through specific sectoral measures. Used same methodology for 2030 scenario.	
TOTAL Mitigated Emissions	25%	5%	8,875,614	46%	10%	4,098,781	885,310	4,984,091 3,897,523	Overall, approximate doubling of effort from 2020 at both state and local level would keep County on track to 2050 reductions.	

Notes:

1. CARB Scoping Plan, 2008, p. 117 to 120 presents a 2030 reduction scenario. Assumptions for state action derived from Scoping Plan as noted in table.
2. State and local measure percent reductions for 2020 are from County GHG Reduction Plan, Appendix A, and are approximations for aggregated sectors.
3. 2030 unmitigated emissions were forecast from 2020 unmitigated emissions using annual average growth factors from County GHG Reduction Plan, Appendix A for aggregated sectors and carrying them out to 2030.

GREENHOUSE GAS EMISSIONS

Development Review Processes County of San Bernardino, California

August 2011

Prepared for:

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CONTENTS

Introduction	1
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ATTACHMENTS

ATTACHMENT 1	4
Performance Standards	5
Methodology relating to 3000 MTCO ₂ e emission level	15
Large residential located outside a city sphere of influence	17
ATTACHMENT 2	19
Screening Tables	19
Instructions	17
References	35
Methods Summary.....	34
Development of Point Value System	35
Methodology for the Development and Application of the Screening Table.....	x
ATTACHMENT 3	41
Determining Project Unmitigated and Mitigated GHG Emissions	42
ATTACHMENT 4	51
Emission Reduction Calculations from Accessory Renewable Energy Projects.....	52

TABLES

Table 1: Screening Table for Implementation of GHG Reduction Measures for Residential Development.....	21
Table 2: Screening Table for Implementation of GHG Reduction Measures for Commercial Development.....	27

Introduction

The San Bernardino County GHG Emissions Reduction Plan (GHG Plan) includes reducing 159,423 Metric Tons of Carbon Dioxide Equivalents (MTCO₂e) per year from new development by 2020 as compared to the 2020 unmitigated conditions.

Mitigation of GHG emissions impacts through the GHG Development Review Process (DRP) provides one of the most substantial reduction strategies for reducing external emissions. The DRP procedures for evaluating GHG impacts and determining significance for CEQA purposes will be streamlined by (1) applying a uniform set of performance standards to all development projects, and (2) utilizing Screening Tables to mitigate project GHG emissions. Projects will have the option of preparing a project-specific technical analysis to quantify and mitigate GHG emissions. A review standard of 3,000 MTCO₂e per year will be used to identify projects that require the use of Screening Tables or a project-specific technical analysis to quantify and mitigate project emissions. The review standard of 3,000 MTCO₂e per year and the performance standard are described in Attachment 1, and the Screening Tables & methodology are described in Attachment 2, the methodology for determining unmitigated and mitigated emission is described in Attachment 3.

As part of the implementation of the County GHG Plan, a uniform set of performance standards will be applied to development projects. These performance standards will be added to the County Development Code to ensure consistent application during development review. The complete Development Review Process, including the use of performance standards, for assessing and mitigating GHG emissions is outlined below.

- a) County Performance Standards. All development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 MTCO₂e PER YEAR will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG emissions. (See Attachment 1 hereto, for description of the performance standards and the methodology relating to the 3,000 MTCO₂e per year level)
- b) Regulatory Agency Performance Standards. When, and if, South Coast Air Quality Management District or Mojave Basin Air Quality Management District adopts standards, the County will consider such guidance and incorporate all applicable standards.

- c) Projects Using Screening Table. For projects exceeding 3,000 MTCO₂e per year of GHG emissions, the County will use Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. Projects that garner a 100 or greater points would not require quantification of project specific GHG emissions. The point system was devised to ensure to Project compliance with the reduction measures in the GHG Plan such that the GHG emissions from new development, when considered together with those existing development, will allow the County to meet its 2020 target and support reductions in GHG emissions beyond 2020. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Attachment 2 hereto, for a full description of the Screening Tables and methodology.)
- d) Projects Not Using Screening Tables. Projects exceeding 3,000 MTY of GHG emissions that do not use the Screening Tables, will be required to quantify project-specific GHG emissions and achieve the equivalent level of GHG emissions efficiency as a 100-point project. Consistent with the CEQA Guidelines, such projects are consistent with the Plan and therefore will be determined to have a less than significant individual and cumulative impact for GHG emissions. (See Attachment 3 hereto for a description of this alternative GHG mitigation analysis and methodology.)
- e) Residential Projects Located Outside City Sphere of Influence. Residential Projects (or mixed use projects with a residential component) in excess of 250 residential dwelling units that are located in unincorporated area not within a City Sphere of Influence (SOI) will not be eligible to use the Screening Tables or rely on the Plan for a determination of less than significant on individual or cumulative impact for GHG emissions. These projects must perform an independent project-specific evaluation of GHG emissions as described in Attachments 1 and 3 hereto, and present project-specific conclusions regarding significance of GHG emissions impacts. (See Attachments 1 and 3 hereto for a full description of the mitigation analysis and methodology for these projects.)

Summary

In total, Projects that emit 3,000 MTCO₂e or more per year are anticipated to reduce a total of approximately 150,600 MTCO₂e per year as compared to the 2020 unmitigated scenario. To summarize the GHG Reductions:

Performance Standards are expected to reduce	5,282.3 MTCO ₂ e per year
Small accessory renewable energy projects are expected to reduce	8,628.0 MTCO ₂ e per year
Projects demonstrating consistency with the GHG Plan will reduce	<u>150,600.0 MTCO₂e per year</u>
Total:	164,510.3 MTCO₂e per year

Note the anticipated reductions, including those attributable to small accessory renewable energy projects described in Attachment 4 hereto, exceed the GHG Plan reductions required for new development by approximately 5,088 MTCO₂e per year.

ATTACHMENT 1:

- a. Performance Standards**
- b. Projects Emitting 3,000 MTCO₂e Per Year or Less**
- c. Residential Projects Outside of City Spheres of Influence**

PERFORMANCE STANDARDS

The GHG reducing performance standards were developed by the County to improve the energy efficiency, water conservation, vehicle trip reduction potential, and other GHG reducing impacts from all new development approved within the unincorporated portions of San Bernardino County. As such, the following Performance Standards establish the minimum level of compliance that development must meet to assist in meeting the 2020 GHG reduction target identified in the in the County GHG Emissions Reduction Plan. These Performance Standards apply to all Projects, including those that are exempt under CEQA, and will be included as Conditions of Approval for development projects.

The following are the Performance Standards (Conditions of Approval) used for Industrial, Commercial and Residential projects in the County:

COMMERCIAL AND INDUSTRIAL PROJECTS

1. GHG – Operational Standards. *The developer shall implement the following as greenhouse gas (GHG) mitigation during the operation of the approved project:*
 - a) Waste Stream Reduction. *The “developer” shall provide to all tenants and project employees County-approved informational materials about methods and need to reduce the solid waste stream and listing available recycling services.*
 - b) Vehicle Trip Reduction. *The “developer” shall provide to all tenants and project employees County-approved informational materials about the need to reduce vehicle trips and the program elements this project is implementing. Such elements may include: participation in established ride-sharing programs, creating a new ride-share employee vanpool, designating preferred parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading for ride sharing vehicles with benches in waiting areas, and/or providing a web site or message board for coordinating rides.*
 - c) Provide Educational Materials. *The developer shall provide to all tenants and staff education materials and other publicity about reducing waste and available recycling services. The education and publicity materials/program shall be submitted to County Planning for review and approval. The developer shall also provide to all tenants and require that the tenants shall display in their stores current transit route information for the project area in a visible and convenient*

location for employees and customers. The specific transit routes displayed shall include Omni Trans Route 8, San Bernardino-Mentone-Yucaipa.

- d) Landscape Equipment. The developer shall require in the landscape maintenance contract and/or in onsite procedures that a minimum of 20% of the landscape maintenance equipment shall be electric-powered.

2. GHG – Construction Standards. *The “developer” shall submit for review and obtain approval from County Planning of a signed letter agreeing to include as a condition of all construction contracts/subcontracts requirements to reduce GHG emissions and submitting documentation of compliance. The developer/construction contractors shall do the following:*

- a) *Implement the approved Coating Restriction Plans.*
- b) *Select construction equipment based on low GHG emissions factors and high-energy efficiency. All diesel/gasoline-powered construction equipment shall be replaced, where possible, with equivalent electric or CNG equipment.*
- c) *Grading contractor shall provide the implement the following when possible:*
- 1) *training operators to use equipment more efficiently.*
 - 2) *identifying the proper size equipment for a task can also provide fuel savings and associated reductions in GHG emissions*
 - 3) *replacing older, less fuel-efficient equipment with newer models*
 - 4) *use GPS for grading to maximize efficiency*
- d) *Grading plans shall include the following statements:*
- *“All construction equipment engines shall be properly tuned and maintained in accordance with the manufacturers specifications prior to arriving on site and throughout construction duration.”*
 - *“All construction equipment (including electric generators) shall be shut off by work crews when not in use and shall not idle for more than 5 minutes.”*
- e) *Schedule construction traffic ingress/egress to not interfere with peak-hour traffic and to minimize traffic obstructions. Queuing of trucks on and off site shall be firmly discouraged and not scheduled. A flagperson shall be retained to maintain efficient traffic flow and safety adjacent to existing roadways.*
- f) *Recycle and reuse construction and demolition waste (e.g. soil, vegetation, concrete, lumber, metal, and cardboard) per County Solid Waste procedures.*
- g) *The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew and educate all construction workers about the required waste reduction and the availability of recycling services.*

3. GHG – Design Standards. *The developer shall submit for review and obtain approval from County Planning that the following measures have been incorporated into the design of the project. These are intended to reduce potential project greenhouse gas (GHGs) emissions. Proper installation of the approved design features and equipment shall be confirmed by County Building and Safety prior to final inspection of each structure.*

a) Title 24 + 5%. *The Developer shall document that the design of the proposed structures exceeds the current Title 24 energy-efficiency requirements by a minimum of five percent. County Planning shall coordinate this review with the County Building and Safety. Any combination of the following design features may be used to fulfill this mitigation, provided that the total increase in efficiency meets or exceeds the cumulative goal (105%+ of Title 24) for the entire project (Title 24, Part 6 of the California Code of Regulations; Energy Efficiency Standards for Residential and Non Residential Buildings, as amended October 1, 2005; Cool Roof Coatings performance standards as amended September 11, 2006):*

- *Incorporate dual paned or other energy efficient windows,*
- *Incorporate energy efficient space heating and cooling equipment,*
- *Incorporate energy efficient light fixtures, photocells, and motion detectors,*
- *Incorporate energy efficient appliances,*
- *Incorporate energy efficient domestic hot water systems,*
- *Incorporate solar panels into the electrical system,*
- *Incorporate cool roofs/light colored roofing,*
- *Incorporate other measures that will increase energy efficiency.*
- *Increase insulation to reduce heat transfer and thermal bridging.*
- *Limit air leakage throughout the structure and within the heating and cooling distribution system to minimize energy consumption.*

b) Plumbing. *All plumbing shall incorporate the following:*

- *All showerheads, lavatory faucets, and sink faucets shall comply with the California Energy Conservation flow rate standards.*
- *Low flush toilets shall be installed where applicable as specified in California State Health and Safety Code Section 17921.3.*
- *All hot water piping and storage tanks shall be insulated. Energy efficient boilers shall be used.*

c) Lighting. *Lighting design for building interiors shall support the use of:*

- *Compact fluorescent light bulbs or equivalently efficient lighting.*

- *Natural day lighting through site orientation and the use of reflected light.*
 - *Skylight/roof window systems.*
 - *Light colored building materials and finishes shall be used to reflect natural and artificial light with greater efficiency and less glare.*
 - *A multi-zone programmable dimming system shall be used to control lighting to maximize the energy efficiency of lighting requirements at various times of the day.*
 - *Provide a minimum of 2.5 percent of the project's electricity needs by on-site solar panels.*
- d) *Building Design.* *Building design and construction shall incorporate the following elements:*
- *Orient building locations to best utilize natural cooling/heating with respect to the sun and prevailing winds/natural convection to take advantage of shade, day lighting and natural cooling opportunities.*
 - *Utilize natural, low maintenance building materials that do not require finishes and regular maintenance.*
 - *Roofing materials shall have a solar reflectance index of 78 or greater.*
 - *All supply duct work shall be sealed and leak-tested. Oval or round ducts shall be used for at least 75 percent of the supply duct work, excluding risers.*
 - *Energy Star or equivalent appliances shall be installed.*
 - *A building automation system including outdoor temperature/humidity sensors will control public area heating, vent, and air conditioning units*
- e) *Landscaping.* *The developer shall submit for review and obtain approval from County Planning of landscape and irrigation plans that are designed to include drought tolerant and smog tolerant trees, shrubs, and groundcover to ensure the long-term viability and to conserve water and energy. The landscape plans shall include shade trees around main buildings, particularly along southern and western elevations, where practical.*
- f) *Irrigation.* *The developer shall submit irrigation plans that are designed, so that all common area irrigation areas shall be capable of being operated by a computerized irrigation system, which includes either an on-site weather station, ET gauge or ET-based controller capable of reading current weather data and making automatic adjustments to independent run times for each irrigation valve based on changes in temperature, solar radiation, relative humidity, rain and wind. In addition, the computerized irrigation system shall be equipped with flow sensing capabilities, thus*

automatically shutting down the irrigation system in the event of a mainline break or broken head. These features will assist in conserving water, eliminating the potential of slope failure due to mainline breaks and eliminating over-watering and flooding due to pipe and/or head breaks.

- g) Recycling. Exterior storage areas for recyclables and green waste shall be provided. Where recycling pickup is available, adequate recycling containers shall be located in public areas. Construction and operation waste shall be collected for reuse and recycling.*
- h) Transportation Demand Management (TDM) Program. The project shall include adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. Preferred carpool/vanpool spaces shall be provided and, if available, mass transit facilities shall be provided (e.g. bus stop bench/shelter). The developer shall demonstrate that the TDM program has been instituted for the project or that the buildings will join an existing program located within a quarter mile radius from the project site that provides a cumulative 20% reduction in unmitigated employee commute trips. The TDM Program shall publish ride-sharing information for ride-sharing vehicles and provide a website or message board for coordinating rides. The Program shall ensure that appropriate bus route information is placed in each building.*

- 4. GHG – Installation/Implementation Standards. The developer shall submit for review and obtain approval from County Planning of evidence that all applicable GHG performance standards have been installed, implemented properly and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety. These installations/ procedures include the following:*
 - a) Design features and/or equipment that cumulatively increases the overall compliance of the project to exceed Title 24 minimum standards by five percent.*
 - b) All interior building lighting shall support the use of fluorescent light bulbs or equivalent energy-efficient lighting.*
 - c) Installation of both the identified mandatory and optional design features or equipment that have been constructed and incorporated into the facility/structure.*

RESIDENTIAL PROJECTS

1. GHG – Operational Standards. *The developer shall implement the following as greenhouse gas (GHG) mitigation during the operation of the approved project:*
 - a) Waste Stream Reduction. *The “developer” shall provide to all tenants and project employees County-approved informational materials about methods and need to reduce the solid waste stream and listing available recycling services.*
 - b) Vehicle Trip Reduction. *The “developer” shall provide to all tenants and homeowners County-approved informational materials about the need to reduce vehicle trips and the program elements this project is implementing. Such elements may include: participation in established ride-sharing programs, creating a new ride-share employee vanpool, and/or providing a web site or message board for coordinating rides.*
 - c) Provide Educational Materials. *The developer shall provide to all tenants and employees education materials and about reducing waste and available recycling services. The education materials shall be submitted to County Planning for review and approval.*
 - d) Landscape Equipment. *The developer shall require in the landscape maintenance contract and/or in onsite procedures that a minimum of 20% of the landscape maintenance equipment shall be electric-powered.*

2. GHG – Construction Standards. *The developer shall submit for review and obtain approval from County Planning of a signed letter agreeing to include as a condition of all construction contracts/subcontracts requirements to reduce impacts to GHG and submitting documentation of compliance. The developer/construction contractors shall do the following:*
 - a) *Implement both the approved Coating Restriction Plans.*
 - b) *Select construction equipment based on low-emissions factors and high-energy efficiency. All diesel/gasoline-powered construction equipment shall be replaced, where possible, with equivalent electric or CNG equipment.*
 - c) *Grading plans shall include the following statements:*
 - *“All construction equipment engines shall be properly tuned and maintained in accordance with the manufacturers specifications prior to arriving on site and throughout construction duration.”*
 - *“All construction equipment (including electric generators) shall be shut off by work crews when not in use and shall not idle for more than 5 minutes.”*

- d) *Schedule construction traffic ingress/egress to not interfere with peak-hour traffic and to minimize traffic obstructions. Queuing of trucks on and off site shall be firmly discouraged and not scheduled. A flagperson shall be retained to maintain efficient traffic flow and safety adjacent to existing roadways.*
 - e) *Recycle and reuse construction and demolition waste (e.g. soil, vegetation, concrete, lumber, metal, and cardboard) per County Solid Waste procedures.*
 - f) *The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew and educate all construction workers about the required waste reduction and the availability of recycling services.*
3. *GHG – Design Standards.* *The developer shall submit for review and obtain approval from County Planning that the following measures have been incorporated into the design of the project. These are to reduce potential project impacts on green house gases (GHGs): Proper installation of the approved design features and equipment shall be confirmed by County Building and Safety prior to final inspection of each structure.*
- a) *Title 24 + 5%.* *The Developer shall document that the design of the proposed structures exceeds the current Title 24 requirements by a minimum of five percent. County Planning shall coordinate this review with the County Building and Safety. Any combination of the following design features may be used to fulfill this mitigation, provided that the total increase in efficiency meets or exceeds the cumulative goal (105%+ of Title 24) for the entire project (Title 24, Part 6 of the California Code of Regulations; Energy Efficiency Standards for Residential and Non Residential Buildings, as amended October 1, 2005; Cool Roof Coatings performance standards as amended September 11, 2006):*
 - *Incorporate dual paned or other energy efficient windows,*
 - *Incorporate energy efficient space heating and cooling equipment,*
 - *Incorporate energy efficient light fixtures, photocells, and motion detectors,*
 - *Incorporate energy efficient appliances,*
 - *Incorporate energy efficient domestic hot water systems,*
 - *Incorporate solar panels into the electrical system,*
 - *Incorporate cool roofs/light colored roofing,*
 - *Incorporate other measures that will increase energy efficiency.*
 - *Increase insulation to reduce heat transfer and thermal bridging.*
 - *Limit air leakage throughout the structure and within the heating and cooling distribution system to minimize energy consumption.*

- b) Plumbing. All plumbing shall incorporate the following:
- All showerheads, lavatory faucets, and sink faucets shall comply with the California Energy Conservation flow rate standards.
 - Low flush toilets shall be installed where applicable as specified in California State Health and Safety Code Section 17921.3.
 - All hot water piping and storage tanks shall be insulated. Energy efficient boilers shall be used.
 - If possible, utilize grey water systems and dual plumbing for recycled water.
- c) Lighting. Lighting design for building interiors shall support the use of:
- Compact fluorescent light bulbs or equivalently efficient lighting.
 - Natural day lighting through site orientation and the use of reflected light.
 - Skylight/roof window systems.
 - Light colored building materials and finishes shall be used to reflect natural and artificial light with greater efficiency and less glare.
 - A multi-zone programmable dimming system shall be used to control lighting to maximize the energy efficiency of lighting requirements at various times of the day.
 - The developer shall ensure that a minimum of 2.5 percent of the project's electricity needs is provided by on-site solar panels.
- d) Building Design. Building design and construction shall incorporate the following elements:
- Orient building locations to best utilize natural cooling/heating with respect to the sun and prevailing winds/natural convection to take advantage of shade, day lighting and natural cooling opportunities.
 - Utilize natural, low maintenance building materials that do not require finishes and regular maintenance..
 - Roofing materials shall have a solar reflectance index of 78 or greater.
 - All supply duct work shall be sealed and leak-tested. Oval or round ducts shall be used for at least 75 percent of the supply duct work, excluding risers.
 - Energy Star or equivalent equipment shall be installed.
 - A building automation system including outdoor temperature/humidity sensors will control public area heating, vent, and air conditioning units
- e) Landscaping. The developer shall submit for review and obtain approval from County Planning of landscape and irrigation plans that are designed to include drought tolerant and smog tolerant trees, shrubs, and groundcover to ensure the

long-term viability and to conserve water and energy. The landscape plans shall include shade trees around main buildings, particularly along southern and western elevations, where practical.

- f) *Irrigation. The developer shall submit irrigation plans that are designed, so that all common area irrigation areas shall be capable of being operated by a computerized irrigation system, which includes either an on-site weather station, ET gauge or ET-based controller capable of reading current weather data and making automatic adjustments to independent run times for each irrigation valve based on changes in temperature, solar radiation, relative humidity, rain and wind. In addition, the computerized irrigation system shall be equipped with flow sensing capabilities, thus automatically shutting down the irrigation system in the event of a mainline break or broken head. These features will assist in conserving water, eliminating the potential of slope failure due to mainline breaks and eliminating over-watering and flooding due to pipe and/or head breaks.*
 - g) *Recycling. Exterior storage areas for recyclables and green waste shall be provided. Adequate recycling containers shall be located in public areas. Construction and operation waste shall be collected for reuse and recycling.*
 - h) *Transportation Demand Management (TDM) Program. The project shall include adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. If available, mass transit facilities shall be provided (e.g. bus stop bench/shelter). The developer shall publish ride-sharing information for ride-sharing vehicles and provide a website or message board for coordinating rides. The Program shall ensure that appropriate bus route information is available to tenants and homeowners.*
4. *GHG – Installation/Implementation Standards. The developer shall submit for review and obtain approval from County Planning of evidence that all applicable GHG performance standards have been installed, implemented properly and that specified performance objectives are being met to the satisfaction of County Planning and County Building and Safety. These installations/ procedures include the following:*
- a) *Design features and/or equipment that cumulatively increases the overall compliance of the project to exceed Title 24 minimum standards by five percent.*
 - b) *All interior building lighting shall support the use of fluorescent light bulbs or equivalent energy-efficient lighting.*
 - c) *Installation of both the identified mandatory and optional design features or equipment that have been constructed and incorporated into the facility/structure.*

3,000 MTCO₂e Emission Level

The County determined the size of development that is too small to be able to provide the level of GHG emission reductions expected from the Screening Tables or alternate emission analysis method (described in Attachment D) based upon the 90th percentile capture rate concept. To do this the County determined the GHG emission amount allowed by a project such that 90 percent of the emissions on average from projects would exceed that level and be “captured” by the Screening Table or alternate emission analysis method.

In determining this level of emissions the County used the database of Projects kept by the Governor’s Office of Planning and Research (OPR). That database contained 798 Projects, 60 of which were extremely large General Plan Updates, Master Plans, or Specific Plan Projects. The 60 very large projects were removed from the database in order not to skew the emissions value, leaving a net of 738 Projects. In addition, 27 projects were found to be outliers that would skew the emission value to high, leaving 711 as the sample population to use in determining the 90th percentile capture rate. Note that while the OPR database is a statewide database and may not exactly reflect emissions within the County, this method was considered conservative because development projects within unincorporated San Bernardino County tend to have higher energy consumption rates and have longer commute distances than the statewide average. As such, using the statewide database may produce an emissions value for the 90th percentile capture rate that may capture more than 90 percent of emissions.

The analysis of the 738 Projects within the sample population combined commercial, residential, and mixed use projects. Also note that the sample of projects included warehousing and other industrial land uses but did not include industrial processes (i.e. oil refineries, heavy manufacturing, electric generating stations, mining operations, etc.). Emissions from each of these Projects were calculated by SCAQMD and provide a consistent method of emissions calculations across the sample population further reducing potential errors in the statistical analysis. In calculating the emissions from Projects within the sample population, construction period GHG emissions were amortized over 30-years (the average economic life of a development project). Direct GHG emissions were calculated using URBEMIS and indirect electricity/water use GHG emissions calculated separately and added to the URBEMIS output.

This analysis determined that the 90th percentile ranged from 2,983-3,143 MTCO₂e per year. The **3,000 MTCO₂e per year** value was chosen as the medial value within that range and is used in defining small projects that must include the Performance Standards as described in this Attachment B, but do not need to use the Screening Tables or alternative GHG mitigation analysis described in Attachment D. The database is summarized in the spreadsheet shown on the following pages.

Insert OPR Spreadsheet here

Large Residential Projects Located Outside a City Sphere of Influence

Residential Projects outside of a City Sphere of Influence that exceed 250 residential units will be required to prepare a project-specific GHG emissions analysis that includes a robust assessment of emissions, appropriate mitigation measures, and the issues associated with land use intensification and VMT generation on a project and regional basis. The analysis must produce an assessment that allows for a determination of whether the specific project causes cumulatively considerable GHG impacts. Residential Projects outside of a City Sphere of Influence that exceed 250 residential units will not qualify for the tiering and streamlining benefits otherwise provided by this Plan as allowed by CEQA Guidelines Section 15183.5 due to the inability to adequately analyze and incorporate programmatic mitigation that comprehensively addresses the issues of GHG emissions for regionally significant residential projects beyond the 2020 analysis horizon. It is anticipated that upon completion of the Sustainable Communities Strategy (SCS) by Southern California Association of Governments (SCAG) and the Regional GHG Reduction Plan currently under preparation by the San Bernardino County Association of Governments (SANBAG), adequate methodology for quantification of regional VMT and more comprehensive mitigation will provide suitable planning tools that can be incorporated into this Plan through a future amendment. Both the SCS and the Regional GHG Reduction Plan are intended to satisfy the requirements of SB 375 and allow better forecasts of GHG emissions in future years, as well as providing a regional strategy for reducing GHG emissions. This provision provides a mechanism to ensure that these types of land use commitments outside of SOIs do not impede the expected emissions trajectory to mid-century and are not likely to conflict with the long term goal of GHG emissions reductions through 2050. This provision is an interim procedure that will be re-examined in a major Plan update and amendment anticipated to occur in 2015 following a new emissions inventory and incorporation of the SCS and Regional GHG reduction measures.

(Insert table here)

ATTACHMENT 2:

- a. Screening Tables**
- b. Methodology for the Development and Application of the Screening Tables**

Screening Tables

The purpose of the Screening Tables is to provide guidance in measuring the reduction of greenhouse gas emissions attributable to certain design and construction measures incorporated into development projects. The analysis, methodology is based upon the GHG Plan, which includes GHG emission inventories, a year 2020 emission reduction target, the goals and policies to reach the target, together with the Programmatic EIR prepared for the GHG Plan.

Instructions for Residential, Commercial, or Industrial Projects

The Screening Table assigns points for each option incorporated into a project as mitigation or a project design feature (collectively referred to as “feature”). The point values correspond to the minimum emissions reduction expected from each feature. The menu of features allows maximum flexibility and options for how development projects can implement the GHG reduction measures. Projects that garner at least 100 points will be consistent with the reduction quantities anticipated in the County’s GHG Plan. As such, those projects that garner a total of 100 points or greater would not require quantification of project specific GHG emissions reductions. Consistent with CEQA Guidelines, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Instructions for Mixed Use Projects

Mixed use projects provide additional opportunities to reduce emissions by combining complimentary land uses in a manner that can reduce vehicle trips. Mixed use projects also have the potential to complement energy efficient infrastructure in a way that reduces emissions. For mixed use projects fill out both Screening Table 1 and Table 2, but proportion the points identical to the proportioning of the mix of uses. As an example, a mixed use project that is 50% commercial uses and 50% residential uses will show ½ point for each assigned point value in Table 1 and Table 2. Add the points from both tables. Mixed use projects that garner at least 100 points will be consistent with the reduction quantities in the County’s GHG Plan and are considered less than significant for GHG emissions.

Instructions for All Projects

Those Projects that garner 100 points using the Screening Tables have provided the “fair share” contribution of reductions and are considered consistent with the GHG Plan.

Those Projects that do not garner 100 points using the screening tables will need to provide additional analysis to determine the significance of GHG emissions. The following tables provide a menu of performance standards/options related to GHG mitigation measures and design features that can be used to demonstrate consistency with the reduction measures and GHG reduction quantities in the GHG Plan.

Table 1: Screening Table for Implementation of GHG Reduction Measures for Residential Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2E6: Energy Efficiency for New Residential			
Building Envelope			
Insulation	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	3 points	
	Enhanced Insulation (15%> Title 24)	7 points	
	Greatly Enhanced Insulation (20%> Title 24)	9 points	
Windows	Title 24 standard (required)	0 points	
	Modestly Enhanced Window Insulation (5% > Title 24)	3 points	
	Enhanced Window Insulation (15%> Title 24)	7 points	
	Greatly Enhanced Window Insulation (20%> Title 24)	9 points	
Doors	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	3 points	
	Enhanced Insulation (15%> Title 24)	7 points	
	Greatly Enhanced Insulation (20%> Title 24)	9 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		
	Title 24 standard (required)	0 points	
	Modest Building Envelope Leakage (5% > Title 24)	3 points	
	Reduced Building Envelope Leakage (15%> Title 24)	7 points	
Thermal Storage of Building	Minimum Building Envelope Leakage (20% > Title 24)	9 points	
	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Thermal storage designed to reduce heating/cooling by 5°F within the building	5 points	
	Thermal storage to reduce heating/cooling by 10°F within the building	10 points	
	Note: Engineering details must be provided to substantiate the efficiency of the thermal storage device.		

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Title 24 standard (required)	0 points	
	Modest Distribution Losses (5% > Title 24)	3 points	
	Reduced Distribution Losses (15%> Title 24)	7 points	
	Greatly Reduced Distribution Losses (20%> Title 24)	9 points	
Space Heating/ Cooling Equipment	Title 24 standard (required)	0 points	
	Efficiency HVAC (5% > Title 24)	3 points	
	High Efficiency HBAC (15%> Title 24)	7 points	
	Very High Efficiency HBAC (20%> Title 24)	9 points	
Building Envelope			
Water Heaters	Title 24 standard (required)	0 points	
	Efficiency Water Heater (Energy Star conventional that is 5% > Title 24)	3 points	
	High Efficiency Water Heater (Conventional water heater that is 15%> Title 24)	7 points	
	High Efficiency Water Heater (Conventional water heater that is 20%> Title 24)	9 points	
	Solar Water Heating System (this option also implements R2E5)	12 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within the living space have at least one window (required)	0 points	
	All rooms within the living space have daylight (through use of windows, solar tubes, skylights, etc.) such that each room has at least 800 lumens of light during a sunny day	3 points	
	All rooms daylighted to at least 1,000 lumens	5 points	
Artificial Lighting	Title 24 standard (required)	0 points	
	Efficient Lights (5% > Title 24)	3 points	
	High Efficiency Lights (LED, etc. 15%> Title 24)	7 points	
	Very High Efficiency Lights (LED, etc. 20%> Title 24)	9 points	
Appliances	Title 24 standard (required)	0 points	
	Efficient Appliances (5% > Title 24)	3 points	
	High Efficiency Energy Star Appliances (15%> Title 24)	7 points	
	Very High Efficiency Appliances (20%> Title 24)	9 points	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Miscellaneous Residential Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes natural heating, cooling, and lighting.	3 point	
Independent Energy Efficiency Calculations	Provide point values based upon energy efficiency modeling of the Project. Note that engineering data will be required documenting the energy efficiency and point values based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Residential Retrofits	<p>The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing residential dwelling units within the unincorporated County is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the San Bernardino County Land Use Services Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following;</p> <p>Will the energy efficiency retrofit project benefit low income or disadvantaged residents?</p> <p>Does the energy efficiency retrofit project fit within the overall assumptions in Reduction Measure R2E3?</p> <p>Does the energy efficiency retrofit project provide co-benefits important to the County?</p> <p>Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.</p>	TBD	
Reduction Measure R2E8: New Home Renewable Energy			
Photovoltaic	<p>Solar Photovoltaic panels installed on individual homes or in collective neighborhood arrangements such that the total power provided augments:</p> <p>Solar Ready Homes (sturdy roof and electric hookups)</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>2 points</p> <p>7 points</p> <p>12 points</p> <p>17 points</p> <p>23 points</p> <p>28 points</p> <p>34 points</p> <p>40 points</p> <p>46 points</p> <p>52 points</p> <p>58 points</p>	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Wind turbines	<p>Some areas of the County lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature.</p> <p>Individual wind turbines at homes or collective neighborhood arrangements of wind turbines such that the total power provided augments:</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>7 points</p> <p>12 points</p> <p>17 points</p> <p>23 points</p> <p>28 points</p> <p>34 points</p> <p>40 points</p> <p>46 points</p> <p>52 points</p> <p>58 points</p>	
Off-site renewable energy project	<p>The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing homes that will help implement R2E6, or the Warehouse Renewable Energy Incentive Program (R2E3).</p> <p>These off-site renewable energy retrofit project proposals will be determined on a case by case basis and must be accompanied by a detailed plan that documents the quantity of renewable energy the proposal will generate. Point values will be determined based upon the energy generated by the proposal.</p>	TBD	
Other Renewable Energy Generation	<p>The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.</p>	TBD	
Reduction Measure R2WC1: Per Capita Water Use Reduction Goal			
Irrigation and Landscaping			
Water Efficient Landscaping	<p>Limit conventional turf to < 20% of each lot (required)</p> <p>Eliminate conventional turf from landscaping</p> <p>Eliminate turf and only provide drought tolerant plants</p> <p>Xeroscaping that requires no irrigation</p>	<p>0 points</p> <p>3 points</p> <p>4 points</p> <p>6 points</p>	

DEVELOPMENT REVIEW PROECESS

Feature		Description	Assigned Point Values	Project Points
Water Efficient irrigation systems	Drip irrigation		1 point	
	Smart irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)		5 points	
Recycled Water	Graywater (purple pipe) irrigation system on site		5 points	
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.		TBD	
Potable Water				
Showers	Title 24 standard (required)		0 points	
	EPA High Efficiency Showerheads (15% > Title 24)		3 points	
Toilets	Title 24 standard (required)		0 points	
	EPA High Efficiency Toilets (15% > Title 24)		3 points	
Faucets	Title 24 standard (required)		0 points	
	EPA High Efficiency faucets (15% > Title 24)		3 points	
Reduction Measure R2T5: Renewable Fuel/Low Emissions Vehicles				
Electric Vehicle Recharging	Provide circuit and capacity in garages of residential units for installation of electric vehicle charging stations		1 point	
	Install electric vehicle charging stations in the garages of residential units		8 points	
Reduction Measure R2T7: Bicycle/Pedestrian Infrastructure				
Sidewalks	Provide sidewalks on one side of the street (required)		0 points	
	Provide sidewalks on both sides of the street		1 point	
	Provide pedestrian linkage between residential and commercial uses within 1 mile		3 points	
Bicycle paths	Provide bicycle paths within project boundaries		TBD	
	Provide bicycle path linkages between residential and other land uses		2 points	
	Provide bicycle path linkages between residential and transit		5 points	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2T6: Vehicle Trip Reduction Measures			
Mixed Use	<p>Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon a TIA demonstrating trip reductions and/or reductions in vehicle miles traveled. Suggested ranges:</p> <p>Diversity of land uses complementing each other (2-28 points)</p> <p>Increased destination accessibility other than transit (1-18 points)</p> <p>Increased transit accessibility (1-25 points)</p> <p>Infill location that reduces vehicle trips or VMT beyond the measures described above (points TBD based on traffic data).</p>	TBD	
Residential Near Local Retail (Residential only Projects)	<p>Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled.</p> <p>The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled (VMT)</p>	TBD	
Other Trip Reduction Measures	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	
Reduction Measure R2W5: Construction and Demolition Debris Diversion Program			
Recycling of Construction/ Demolition Debris	<p>Recycle 2% of debris (required)</p> <p>Recycle 5% of debris</p> <p>Recycle 8 % of debris</p> <p>Recycle 10% of debris</p> <p>Recycle 12% of debris</p> <p>Recycle 15% of debris</p> <p>Recycle 20% of debris</p>	<p>0 points</p> <p>1 point</p> <p>2 points</p> <p>3 points</p> <p>4 points</p> <p>5 points</p> <p>6 points</p>	
Reduction Measure R2W6: 75 Percent Solid Waste Diversion Program			
Recycling	<p>County initiated recycling program diverting 75% of waste requires coordination in neighborhoods to realize this goal. The following recycling features will help the County fulfill this goal:</p> <p>Provide greenwaste composting bins at each residential unit</p> <p>Multi-family residential projects that provide dedicated recycling bins separated by types of recyclables combined with instructions/education program explaining how to use the bins and the importance or recycling.</p>	<p>3 points</p> <p>2 points</p>	
Total Points Earned by Residential Project:			

Table 2: Screening Table for Implementation of GHG Reduction Measures for Commercial Development

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2E7: Energy Efficiency for Commercial Development			
Building Envelope			
Insulation	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	4 points	
	Enhanced Insulation (15%> Title 24)	8 points	
	Greatly Enhanced Insulation (20%> Title 24)	12 points	
Windows	Title 24 standard (required)	0 points	
	Modestly Enhanced Window Insulation (5% > Title 24)	4 points	
	Enhanced Window Insulation (15%> Title 24)	8 points	
	Greatly Enhanced Window Insulation (20%> Title 24)	12 points	
Doors	Title 24 standard (required)	0 points	
	Modestly Enhanced Insulation (5% > Title 24)	4 points	
	Enhanced Insulation (15%> Title 24)	8 points	
	Greatly Enhanced Insulation (20%> Title 24)	12 points	
Air Infiltration	Minimizing leaks in the building envelope is as important as the insulation properties of the building. Insulation does not work effectively if there is excess air leakage.		
	Title 24 standard (required)	0 points	
	Modest Building Envelope Leakage (5% > Title 24)	4 points	
	Reduced Building Envelope Leakage (15%> Title 24)	8 points	
Thermal Storage of Building	Minimum Building Envelope Leakage (20% > Title 24)	12 points	
	Thermal storage is a design characteristic that helps keep a constant temperature in the building. Common thermal storage devices include strategically placed water filled columns, water storage tanks, and thick masonry walls.		
	Thermal storage designed to reduce heating/cooling by 5°F within the building	6 points	
	Thermal storage to reduce heating/cooling by 10°F within the building	12 points	
	Note: Engineering details must be provided to substantiate the efficiency of the thermal storage device.		

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Indoor Space Efficiencies			
Heating/ Cooling Distribution System	Title 24 standard (required)	0 points	
	Modest Distribution Losses (5% > Title 24)	4 points	
	Reduced Distribution Losses (15%> Title 24)	8 points	
	Greatly Reduced Distribution Losses (15%> Title 24)	12 points	
Space Heating/ Cooling Equipment	Title 24 standard (required)	0 points	
	Efficiency HVAC (5% > Title 24)	4 points	
	High Efficiency HBAC (15%> Title 24)	8 points	
	Very High Efficiency HBAC (20%> Title 24)	12 points	
Building Envelope			
Commercial Heat Recovery Systems	Heat recovery strategies employed with commercial laundry, cooking equipment, and other commercial heat sources for reuse in HVAC air intake or other appropriate heat recovery technology. Point values for these types of systems will be determined based upon design and engineering data documenting the energy savings.	TBD	
Water Heaters	Title 24 standard (required)	0 points	
	Efficiency Water Heater (Energy Star conventional that is 5% > Title 24)	4 points	
	High Efficiency Water Heater (Conventional water heater that is 15%> Title 24)	8 points	
	High Efficiency Water Heater (Conventional water heater that is 20%> Title 24)	12 points	
	Solar Water Heating System (commercial only-this reduction feature also implements R2E10)	14 points	
Daylighting	Daylighting is the ability of each room within the building to provide outside light during the day reducing the need for artificial lighting during daylight hours.		
	All peripheral rooms within building have at least one window or skylight	1 points	
	All rooms within building have daylight (through use of windows, solar tubes, skylights, etc.) such that each room has at least 800 lumens of light during a sunny day	5 points	
	All rooms daylighted to at least 1,000 lumens	7 points	
Artificial Lighting	Title 24 standard (required)	0 points	
	Efficient Lights (5% > Title 24)	4 points	
	High Efficiency Lights (LED, etc. 15%> Title 24)	6 points	
	Very High Efficiency Lights (LED, etc. 20%> Title 24)	8 points	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Appliances	Title 24 standard (required) Efficient Appliances (5% > Title 24) High Efficiency Energy Star Appliances (15%> Title 24) Very High Efficiency Appliances (20%> Title 24)	0 points 4 points 8 points 12 points	
Miscellaneous Commercial Building Efficiencies			
Building Placement	North/South alignment of building or other building placement such that the orientation of the buildings optimizes conditions for natural heating, cooling, and lighting.	4 point	
Other	This allows innovation by the applicant to provide design features that increases the energy efficiency of the project not provided in the table. Note that engineering data will be required documenting the energy efficiency of innovative designs and point values given based upon the proven efficiency beyond Title 24 Energy Efficiency Standards.	TBD	
Existing Commercial building Retrofits	The applicant may wish to provide energy efficiency retrofit projects to existing residential dwelling units to further the point value of their project. Retrofitting existing commercial buildings within the unincorporated County is a key reduction measure that is needed to reach the reduction goal. The potential for an applicant to take advantage of this program will be decided on a case by case basis and must have the approval of the San Bernardino County Land Use Services Department. The decision to allow applicants to ability to participate in this program will be evaluated based upon, but not limited to the following: Will the energy efficiency retrofit project benefit low income or disadvantaged communities? Does the energy efficiency retrofit project fit within the overall assumptions in Reduction Measure R2E4? Does the energy efficiency retrofit project provide co-benefits important to the County? Point value will be determined based upon engineering and design criteria of the energy efficiency retrofit project.	TBD	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2E9 and R2E10: New Commercial/Industrial Renewable Energy			
Photovoltaic	<p>Solar Photovoltaic panels installed on commercial buildings or in collective arrangements within a commercial development such that the total power provided augments:</p> <p>Solar Ready Roofs (sturdy roof and electric hookups)</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>2 points</p> <p>7 points</p> <p>13 points</p> <p>19 points</p> <p>25 points</p> <p>31 points</p> <p>37 points</p> <p>43 points</p> <p>49 points</p> <p>55 points</p> <p>60 points</p>	
Wind turbines	<p>Some areas of the County lend themselves to wind turbine applications. Analysis of the areas capability to support wind turbines should be evaluated prior to choosing this feature. Wind turbines as part of the commercial development such that the total power provided augments:</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>7 points</p> <p>13 points</p> <p>19 points</p> <p>25 points</p> <p>31 points</p> <p>37 points</p> <p>43 points</p> <p>49 points</p> <p>55 points</p> <p>60 points</p>	
Off-site renewable energy project	<p>The applicant may submit a proposal to supply an off-site renewable energy project such as renewable energy retrofits of existing residential that will help implement R2E1, existing commercial/industrial that will help implement R2E2, or the Warehouse Renewable Energy Incentive Program (R2E4). These off-site renewable energy retrofit project proposals will be determined on a case by case basis accompanied by a detailed plan documenting the quantity of renewable energy the proposal will generate. Point values will be based upon the energy generated by the proposal.</p>	TBD	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Other Renewable Energy Generation	The applicant may have innovative designs or unique site circumstances (such as geothermal) that allow the project to generate electricity from renewable energy not provided in the table. The ability to supply other renewable energy and the point values allowed will be decided based upon engineering data documenting the ability to generate electricity.	TBD	
Reduction Measure R2E7: Warehouse Renewable Energy Incentive Program			
Warehouse Photovoltaic	<p>This measure is for warehouse projects and involves partnership with Sothern California Edison and California Public Utilities Commissions to develop an incentive program for solar installation on new and retrofit existing warehouses. A mandatory minimum solar requirement for new warehouse space. Solar Photovoltaic panels installed on warehouses or in collective arrangements within a logistics/warehouse complex such that the total power provided augments:</p> <p>Solar Ready Roof (sturdy roof and electric hookups)</p> <p>10 percent of the power needs of the project</p> <p>20 percent of the power needs of the project</p> <p>30 percent of the power needs of the project</p> <p>40 percent of the power needs of the project</p> <p>50 percent of the power needs of the project</p> <p>60 percent of the power needs of the project</p> <p>70 percent of the power needs of the project</p> <p>80 percent of the power needs of the project</p> <p>90 percent of the power needs of the project</p> <p>100 percent of the power needs of the project</p>	<p>2 points</p> <p>4 points</p> <p>5 points</p> <p>7 points</p> <p>9 points</p> <p>11 points</p> <p>13 points</p> <p>15 points</p> <p>17 points</p> <p>19 points</p> <p>21 points</p>	
Reduction Measure R2WC-1: Per Capita Water Use Reduction Goal			
Irrigation and Landscaping			
Water Efficient Landscaping	<p>Limit conventional turf to < 20% of each lot (required)</p> <p>Eliminate conventional turf from landscaping</p> <p>Eliminate turf and only provide drought tolerant plants</p> <p>Xeroscaping that requires no irrigation</p>	<p>0 points</p> <p>3 points</p> <p>4 points</p> <p>6 points</p>	
Water Efficient irrigation systems	<p>Drip irrigation</p> <p>Smart irrigation control systems combined with drip irrigation (demonstrate 20 reduced water use)</p>	<p>1 point</p> <p>5 points</p>	
Recycled Water	Graywater (purple pipe) irrigation system on site	5 points	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Storm water Reuse Systems	Innovative on-site stormwater collection, filtration and reuse systems are being developed that provide supplemental irrigation water and provide vector control. These systems can greatly reduce the irrigation needs of a project. Point values for these types of systems will be determined based upon design and engineering data documenting the water savings.	TBD	
Potable Water			
Showers	Title 24 standard (required) EPA High Efficiency Showerheads (15% > Title 24)	0 points 3 points	
Toilets	Title 24 standard (required) EPA High Efficiency Toilets/Urinals (15% > Title 24) Waterless Urinals (note that commercial buildings having both waterless urinals and high efficiency toilets will have a combined point value of 6 points)	0 points 3 points 3 points	
Faucets	Title 24 standard (required) EPA High Efficiency faucets (15% > Title 24)	0 points 3 points	
Commercial Dishwashers	Title 24 standard (required) EPA High Efficiency dishwashers (20% water savings)	0 points 4 points	
Commercial Laundry Washers	Title 24 standard (required) EPA High Efficiency laundry (15% water savings) EPA High Efficiency laundry Equipment that captures and reuses rinse water (30% water savings)	0 points 3 points 6 points	
Commercial Water Operations Program	Establish an operational program to reduce water loss from pools, water features, etc., by covering pools, adjusting fountain operational hours, and using water treatment to reduce draw down and replacement of water. Point values for these types of plans will be determined based upon design and engineering data documenting the water savings.	TBD	
Reduction Measure R2T1: Anti-Idling Enforcement			
Commercial Vehicle Idling Restrictions	All commercial vehicles are restricted to 5-minutes or less per trip on site and at loading docks (required of all commercial projects)	1 point	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2T2: Employment Based Trip and VMT Reduction Policy			
Compressed Work Week	Reduce the number of days per week that employees need to be on site will reduce the number of vehicle trips associated with commercial/industrial development. Compressed work week such that full time employees are on site:		
	5 days per week	0 points	
	4 days per week on site	4 points	
	3 days per week on site	8 points	
Car/Vanpools	Car/vanpool program	1 point	
	Car/vanpool program with preferred parking	2 points	
	Car/vanpool with guaranteed ride home program	3 points	
	Subsidized employee incentive car/vanpool program	5 points	
	Combination of all the above	6 points	
Employee Bicycle/ Pedestrian Programs	Complete sidewalk to residential within ½ mile	1 point	
	Complete bike path to residential within 3 miles	1 point	
	Bike lockers and secure racks	1 point	
	Showers and changing facilities	2 points	
	Subsidized employee walk/bike program	3 points	
	Note combine all applicable points for total value		
Shuttle/Transit Programs	Local transit within ¼ mile	1 point	
	Light rail transit within ½ mile	3 points	
	Shuttle service to light rail transit station	5 points	
	Guaranteed ride home program	1 points	
	Subsidized Transit passes	2 points	
	Note combine all applicable points for total value		
CRT	Employer based Commute Trip Reduction (CRT). CRTs apply to commercial, offices, or industrial projects that include a reduction of vehicle trip or VMT goal using a variety of employee commutes trip reduction methods. The point value will be determined based upon a TIA that demonstrates the trip/VMT reductions. Suggested point ranges:	TBD	
	Incentive based CRT Programs (1-8 points)		
	Mandatory CRT programs (5-20 points)		
Other Trip Reductions	Other trip or VMT reduction measures not listed above with TIA and/or other traffic data supporting the trip and/or VMT for the project.	TBD	

DEVELOPMENT REVIEW PROECESS

Feature	Description	Assigned Point Values	Project Points
Reduction Measure R2T4: Signal Synchronization and Intelligent Traffic Systems			
Signal improvements	Signal synchronization-1 point per signal	1 point/signal	
	Traffic signals connected to ITS	3 points/ signal	
Reduction Measure R2T5: Renewable Fuel/Low Emissions Vehicles			
Electric Vehicle Recharging	Provide circuit and capacity in garages/parking areas for installation of electric vehicle charging stations.	2 points/area	
	Install electric vehicle charging stations in garages/parking areas	8 points/station	
Reduction Measure R2T6: Vehicle Trip Reduction Measures			
Mixed Use	Mixes of land uses that complement one another in a way that reduces the need for vehicle trips can greatly reduce GHG emissions. The point value of mixed use projects will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Local Retail Near Residential (Commercial only Projects)	Having residential developments within walking and biking distance of local retail helps to reduce vehicle trips and/or vehicle miles traveled. The point value of residential projects in close proximity to local retail will be determined based upon traffic studies that demonstrate trip reductions and/or reductions in vehicle miles traveled	TBD	
Reduction Measure R2W5: Construction and Demolition Debris Diversion Program			
Recycling of Construction/ Demolition Debris	Recycle 2% of debris (required)	0 points	
	Recycle 5% of debris	1 point	
	Recycle 8 % of debris	2 points	
	Recycle 10% of debris	3 points	
	Recycle 12% of debris	4 points	
	Recycle 15% of debris	5 points	
	Recycle 20% of debris	6 points	
Reduction Measure R2W6: 75 Percent Solid Waste Diversion Program			
Recycling	County initiated recycling program diverting 75% of waste requires coordination with commercial development to realize this goal. The following recycling features will help the County fulfill this goal:		
	Provide separated recycling bins within each commercial building/floor and provide large external recycling collection bins at central location for collection truck pick-up	2 points	
	Provide commercial/industrial recycling programs that fulfills an on-site goal of 75% diversion of solid waste	5 points	
Total Points Earned by Commercial/Industrial Project:			

References

Association of Environmental Professionals (AEP) White Paper: Alternative Approaches to Analyzing Greenhouse Gases and Global Climate Change Impacts in CEQA Documents, June 2007.

Association of Environmental Professionals (AEP) White Paper: Community-wide Greenhouse Gas Emission Inventory Protocols, Mach 2011.

Bass, Ronald E., Herson, Albert I. and Bogdan, Kenneth M., CEQA Deskbook, April 1999

California Air Pollution Control Officers Association (CAPCOA), White Paper: CEQA and Climate Change, January 2008

California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures, August 2010

California Air Resources Board, AB 32 Scoping Plan, December 2009

California Climate Action Team's Final Report to the Governor and Legislature, March 2007

California Climate Action Registry, General Reporting Protocol, Version 2.2, March 2007

San Bernardino County, Draft Greenhouse Reduction Plan, March 2011

South Coast Air Quality Management District, Rules and Regulations, 2010

U.S. Environmental Protection Agency, AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, September 1995

U.S. Environmental Protection Agency, AP-42, Final Rule on Update to the Compilation of Air Pollutant Emission Factors, October 2009

METHODS SUMMARY FOR SCREENING TABLES

The point values in the Screening Tables were derived from the projected emissions reductions that each of the R2 reduction measures within the San Bernardino County GHG Reduction Plan (GHG Plan) would achieve. The GHG Plan shows the reduced emissions for each of the reduction measures in aggregate terms, meaning that the total emission reductions afforded each measure is based on both changes in existing land use activities as well as how new development is designed and built. In order to correctly allocate the emission reductions within the Screening Table, the amount of emission reductions afforded new development had to be segregated out of the aggregate total in a manner that is described below. Once the process of segregating new development out of the aggregate reduction totals was completed, the points were then proportion by residential unit or square feet of commercial/industrial uses. This was accomplished by taking the predicted growth in households and commercial/industrial uses by the year 2020 and assigned the appropriate proportion of the total R2 reduction quantities for new development to the residential, commercial, and industrial land use sectors within the Screening Table. The result is point values that are allocated by residential unit or commercial/industrial square footage (measured in 1000 sq.ft.). Because of this, the size of the project is not relevant to the Screening Table. Regardless of size, each project needs to achieve 100 points to demonstrate consistency with the GHG Plan. Efficiency, not size of the Project is critical. The following emission factor can be used in determining the amount of emissions reduced per point in the Screening Table:

The respective calculated emission values are in metric tons of carbon dioxide equivalents (MTCO_{2e})

For Residential Projects:

0.092 MTCO_{2e} per Point per Residential Unit

For Commercial and Industrial Projects:

0.691 MTCO_{2e} per Point per 1,000 Square Feet of gross Commercial/Industrial building area

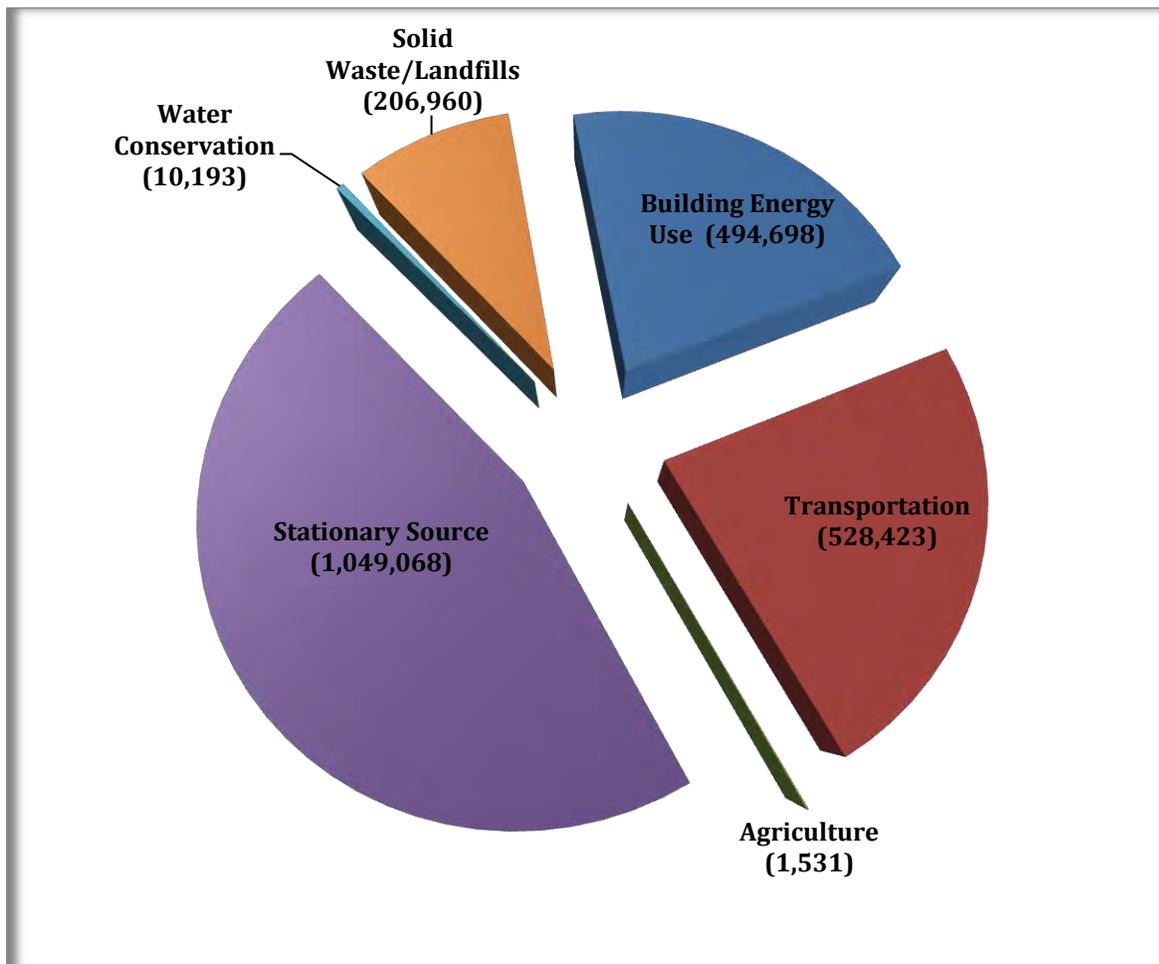
Note that the Screening Table and point values are best used for typical development projects processed by the County. Examples of typical development projects include residential subdivisions, multi-family residential apartments, condominiums and townhouses, retail commercial, big box retail, office buildings, business parks, and typical warehousing. Mixed use projects can use the Screening Tables following the instructions. Transit oriented development (TOD), and infill projects are able to use the Screening Tables, but the Screening Table points are likely to underestimate total emission reductions afforded these types of projects. Note that the Screening Tables include the opportunity to custom develop points (using the factors above) in order to account for the predicted reductions in vehicle trips and vehicle miles traveled within a project specific traffic study and GHG analysis. TOD and infill projects can be more accurately assessed and allocated points using this method.

However, more unusual types of industrial projects such as cement manufacturing, metal foundries, refrigerant manufacturing, electric generating stations, and oil refineries cannot use the Screening Tables because the emission sources for those types of uses were not contemplated in the table.

DEVELOPMENT OF THE POINT VALUES

The first step in developing the point system was the need to determine the total reductions afforded the GHG Plan. Figure 1 below shows the total emission reductions achieved by the GHG Plan. In total 2,290,874MMTCO₂e will be reduced as a result of the GHG Plan.

Figure 1



The next step in developing the point system is to segregate out the State efforts in reducing GHG emissions within the County. Table 1 shows the reductions allocated to State measures and County strategies.

Table 1

Sector	2020 Reduction (MTCO ₂ e)		Total
	State Strategies	County Strategies	
Building Energy -Energy Efficiency and Alternative Energy	335,246	159,452	494,699
Transportation and Land Use	486,157	42,266	528,423
Solid Waste/Landfills	0	206,960	206,960
Stationary Source	1,049,068	0	1,049,068
Agriculture & Resource Conservation	1,531	0	1,531
Water Conservation	10,193	0	10,193
Total	1,882,195	408,678	2,290,874

As shown in Table 1, 408,678 MMTCO₂e are reduced by the County's R2 measures. This amount includes reductions afforded existing building retrofits, other changes to activities associated with existing land uses, as well as reductions associated with new development.

The next step is to segregate out of the County strategies total the amount of emissions that will be reduced within new development.

Table 2 on the next page summarizes the reduction in emissions afforded new development from the R2 measures. Table 2 shows 159,423 MTCO₂e being reduced from new development as a result of the County strategies (R2 measures in the GHG Plan). Within the 138,377 MTCO₂e of new development reductions afforded County strategies, 117,385 MTCO₂e of emissions reduced is accomplished through new Commercial and Industrial Projects, and 42,038 MTCO₂e of emissions reduced is accomplished through new residential projects.

The County predicts that 5,083 new residential units will be needed by 2020 to accommodate the population growth by 2020 and 18,873 new jobs will be generated due to growth. A total of approximately 1,887,300 square feet of new commercial and industrial buildings within the unincorporated County area is needed to accommodate anticipated job growth. This estimate is based on the relationship between past growth in employment to the average growth in commercial/industrial building area for San Bernardino County.

Dividing the 42,038 MTCO₂e reductions of emissions afforded the R2 measures for new residential development by the anticipated net of 4,575 new residential units that will be built yields 9.2 MTCO₂e per residential unit that needs to be reduced to fulfill the anticipated reductions of the GHG Plan. That amount equals 100 points, producing the following equation for the point value:

0.083 MTCO₂e per Point per Residential Unit

A similar process was used to derive the point value for new commercial/Industrial development dividing 117,384.9 MTCO₂e reductions of emissions afforded the R2 measures for new commercial/industrial development by the anticipated net of 1,698,570 square feet of new commercial/industrial buildings that will be built yields 6.91 MTCO₂e per 100 square feet of building. That amount equals 100 points, producing the following equation for the point value:

0.0691 MTCO₂e per Point per 100 Square Feet of gross building area. Because commercial/industrial land uses are typically described in thousand square feet of building space, the point value was converted as follows: **0.691 MTCO₂e per 1,000 Sq. Ft. of gross Commercial/Industrial building area.**

The final step was to allocate points to each of the reduction measures in order to provide the menu of point values. The spreadsheet on the next page shows emission reductions afforded each measure. Note that emissions associated with new development are reduced by the State's R1 measures, as well as the County's R2 measures. The Screening Tables focus on those measures the County is implementing associated with new development within the unincorporated County area. For this reason, the menu of options pertains to the portions of the R2 measures pertaining to new development.

Table 2

Reduction Number	Reduction Measure Name	Reduced Emissions(MTCO ₂ e)	
		Commercial/Industrial	Residential
R2E4	Warehouse Renewable Energy	6,786.0	
R2E5	Solar Hot Water Systems		11,907.0
R2E6	Residential Energy Efficiency		9,460.0
R2E7	Commercial/Industrial Energy Efficiency	35,342.0	
R2E8	New Home Renewable Energy		2,239.0
R2E9	New Commercial/Industrial Renewable Energy	25,392.0	
R2E10	Comm/Ind. Rehab/Expansion Renewable Energy	21,086	
R2T1	Anti-Idling Enforcement Policy	2,415.2	
R2T2	Employer VMT Reduction	1,651.0	
R2T3	Parking Policies	824.0	
R2T4	Road Improvement/Signal Synchronization/TFM	8,230.0	
R2T5	Low and Zero Emission Vehicle Infrastructure	5,431.7	10,863.3
R2T6	Rideshare/Carpooling Programs	798.0	
R2T7	Bicycle/Pedestrian Infrastructure	532.0	266.0
R2T8	HOV Lanes	1,594.0	
R2W5	Construction Debris Diversion	147.5	147.5
R2W6	75 Percent Waste Diversion	2,059.0	2,059.0
R2WC1	Per Capita Water Reduction	5,096.5	5,096.5
Total R2 Reductions for New Development		117,384.9	42,038.3

ATTACHMENT 3:

Determining Project Unmitigated and Mitigated GHG Emissions

**SAN BERNARDINO COUNTY
GREENHOUSE GAS DEVELOPMENT REVIEW PROCESS
DETERMINING PROJECT UNMITIGATED AND MITIGATED GREENHOUSE GAS EMISSIONS**

San Bernardino County intends to use a Development Review Process to review individual projects for compliance with the San Bernardino County Greenhouse Gas Reduction Plan (Plan). Screening tables have been developed utilizing a 100-point scale that corresponds to approximately 138,227 metric tons of carbon dioxide equivalents per year (MTCO₂e) of emissions reductions attributable to new development within the Plan. That level of emissions reductions is approximately 31 percent reduction of new development greenhouse gas (GHG) emissions (in the aggregate) compared to an unmitigated condition. The scale has been derived from calculations of the 2020 unmitigated emissions at the County level and the mitigative effects of different reduction strategies included in the Plan. Where projects utilize the screening table and qualify for 100 points, the project can be considered less than significant under CEQA and will not be required to quantify their individual project emission reductions. Where a project does not use the screening tables, the project is required to quantify its unmitigated emissions and provide a 31 percent reduction of those emissions in order to be considered less than significant. This memorandum describes a methodology to estimate project-level unmitigated and mitigated emissions.

The Plan includes a set of inventories as follows:

2007 Emissions = 6.25 MTCO₂e

2020 Unmitigated Emissions = 7.59 MTCO₂e (Results by applying predicted growth rates to the 2007 emissions in predicting 2020 unmitigated emissions)

Reduction Target = 5.31 MTCO₂e [requires new development in the County to achieve a 31% reduction (in the aggregate) from the 2020 unmitigated emissions scenario to reduce total emissions in the County down to this level]

The Plan includes a forecast of 2020 unmitigated emissions from a benchmark of 2007 emissions. No emission reductions from future regulations or standards were afforded the 2020 unmitigated emission forecast. This means that the unmitigated emissions shown for 2020 are forecast using the predicted growth in each of the sectors but have an average GHG efficiency equivalent to that of buildings, transportation, and other emission sectors as they were in 2007. As such, 2007 constitutes the benchmark for all projects under evaluation through the development review process. Thus, calculation of unmitigated project GHG emissions is a calculation of what the project's GHG emissions would be under average efficiency assumptions for 2007. Project proponents then must calculate their estimate of current GHG emissions including any applicant-proposed reduction measures to determine whether or not the project will or won't provide 31 percent or more reductions.

Methods are described below for the building energy, transportation, waste, water conveyance emissions. Other source categories will require custom calculations. Due to the complexity of some of

the calculations for unmitigated and mitigated emissions, the need for accuracy, and the challenge of avoiding double-counting, it is recommended that emissions estimates only be prepared by qualified air quality experts. All estimates should provide full documentation of all assumptions and methods utilized. The County will review all provided estimates for adequacy and will only accept sufficiently detailed and supported estimates prepared by qualified individuals.

PROJECT GHG EMISSION SOURCES

Total GHG emissions are the sum of emissions from both direct and indirect sources. Direct sources include mobile sources such as offroad equipment, motor vehicles, landscape equipment; and stationary sources such as cooling and heating equipment. Indirect sources are comprised of electrical generation, and energy use in supplying potable water, as well as the disposal of solid waste, and the treatment of waste water.

Direct GHG emissions from mobile and stationary sources are determined as the sum of the annual GHG emissions from offroad equipment, motor vehicles, landscape equipment, and heating and cooling equipment.

Indirect sources are determined based on source as follows. Electrical usage is reported as annual emissions from electrical usage. Potable water usage is reported as the annual emissions from electricity used for potable water treatment and transportation. Solid waste is reported as the sum of annual emissions from solid waste disposal treatment, transportation, and fugitive emissions of methane at the solid waste facilities. Wastewater usage is reported as the annual emissions from wastewater transport and treatment.

BUILDING ENERGY

Building energy emissions associated with electricity and natural gas assumption are estimated by determining the amount of electricity (in kilowatt-hours) and natural gas consumption (in therms) and then multiplying by the GHG factors corresponding to electricity generation (per kwh) and natural gas combustion (per therm).

Project proponents can utilize the Residential Energy Consumption Survey (RECS) prepared by the U.S. Energy Information Administration (EIA) to determine the approximate average kwh per residential unit for residential projects of similar character as the proposed project. At present, the closest set of data to 2007 is the 2005 version of the RECS.

Project proponents can utilize the Commercial Buildings Energy Consumption Survey (CBECS) prepared by EIA to determine the approximate average therms per residential unit for commercial buildings of similar character as the proposed project. A 2007 version of CBECS should be available in 2011.

Where buildings are not comparable to a RECS or CBECS category, then project proponents must derive a separate rationale for 2007 average building energy consumption by obtaining data on at least three comparable "average" buildings in San Bernardino County by which to derive appropriate factors.

Once the baseline electricity and natural gas consumption have been identified, then they should be multiplied by the GHG intensity factors in Table 1.

RECS is available on the internet here: <http://www.eia.doe.gov/emeu/recs/>

CBECS is available on the internet here: <http://www.eia.doe.gov/emeu/cbecs/>

TRANSPORTATION

Project proponents can estimate their unmitigated onroad transportation emissions level by utilizing the current land use emissions model recommended by SCAQMD and using the 2007 model year. The current SCAQMD recommended model is the California Emissions Estimator model (CalEEMod) and is available free of charge and a user manual describes how to utilize the model.

CalEEMod can also be used to calculate operational GHG emissions (carbon dioxide, CO₂; methane, CH₄; and nitrous oxide N₂O). CalEEMod uses default trip generation factors, but these factors can be adjusted to reflect site-specific details. Also, CalEEMod uses default trip lengths that may or may not be appropriate in order to capture the full length of project-related trips. Important steps for running CalEEMod are as follows:

1. Without a traffic study prepared for the project,
 - a. Provide the density of the project in CalEEMod (residential units per acre and/or square feet of commercial building per acre), and
 - b. The user should consult with the local air district for direction on which default options should be used in the modeling exercise. Some air districts have recommendations in the CEQA guidelines.
2. If a traffic study was prepared specifically for the project, the following information must be provided:
 - a. Total number of average daily vehicle trips or trip-generation rates by land use type per number of units; and,
 - b. Average VMT per residential and nonresidential trip.
 - c. The user overwrites the "Trip Rate (per day)" fields for each land use in CALEEMOD such that the resultant "Total Trips" and the "Total VMT" match the number of total trips and total VMT contained in the traffic study.
 - d. Overwrite "Trip Length" fields for residential and nonresidential trips in UBEMIS with the project-specific lengths obtained from the traffic study.
3. Calculate results and obtain the GHG emissions from the CalEEMod output file.

Offroad emissions can be estimated by identifying the types of equipment and operational timeframes. CARB's EMFAC model can provide carbon dioxide emission factors for a wide variety of equipment.

Alternatively, if fuel consumption totals can be estimated, then they can be multiplied by the GHG factors in Table 1 below.

CalEEMod is available on the internet here: <http://www.caleemod.com/>

EMFAC is available on the internet here: http://www.arb.ca.gov/msei/onroad/latest_version.htm

WASTE

Project proponents needs to estimate their level of annual waste generation using factors from the CIWMB reporting for San Bernardino County in 2007:

- Per capita disposal rate = 6.2 pounds/day = 1.03 metric tons/year per resident
- Per capita disposal rate = 38 pounds/day = 6.29 metric tons/year per employee

CIWMB reports are available on the internet here:

<http://www.calrecycle.ca.gov/LGCentral/Tools/MARS/DRMCMMain.asp>

Once the unmitigated annual level of waste generation have been identified, then it should be multiplied by the GHG intensity factor utilized in the Plan as follows:

- *2007 average GHG emissions per metric ton of waste (2007) = 0.005526 metric tons*

WATER

Project proponents need to estimate the annual amount of water consumption on an annual basis for the proposed project on a 2007 average basis:

- Per capita water consumption = XX gallons/day = XX acre-feet/year per resident
- Per capita water consumption = XX gallons/day = XX acre-feet/year per employee

Once the unmitigated level of annual water consumption has been identified, then it should be multiplied by the GHG intensity factors utilized in the Plan as follows:

- *2007 average GHG emissions per acre-foot of water = 0.49 metric tons/*

WASTEWATER

Project proponents need to estimate the annual amount of wastewater generation on an annual basis for the proposed project on a 2007 average basis.

- Per capita wastewater generation = XX gallons/day = XX acre-feet/year per resident

Once the unmitigated level of annual wastewater generation has been identified, then it should be multiplied by the GHG intensity factors utilized in the Plan as follows:

- *2007 average GHG emissions for wastewater = 0.096 metric tons per resident*

POINT SOURCES AND OTHER SOURCES

If the project includes point sources of GHGs, such as industrial consumption of fuels other than natural gas, cement manufacture, or other sources, then custom calculations will have to be made in order to determine the 2007 unmitigated level.

ESTIMATING PROJECT MITIGATED EMISSIONS

Once the unmitigated 2007 emissions for the project have been calculated, then the mitigated project emissions can be calculated. Mitigated project emissions can and should take into account the following:

The current level of GHG efficiency. Since the benchmark year is 2007, the current level of GHG efficiency may be improved since 2007. Where a source sector is not covered by adopted state and

local measures (see discussion below), analysis of development projects should use the emission factors found in the latest version of the California Climate Action Registry (CCAR) General Reporting Protocol. Quantification of emissions from electricity used for potable water treatment and transportation as well as wastewater transport and treatment can be found in the California Energy Commission (CEC) document titled “Refining Estimates of Water-Related Energy Use in California (CEC December 2006).

The effect of adopted state and local measures by 2020. The state has adopted numerous measures to reduce GHG emissions, including vehicle standards, a low carbon fuel standard, a renewable energy standard, and other measures. The state mandates listed in Table 2 can be included in the County-required 31 percent reduction if they specifically relate to the proposed project. Table 3 provides an example of which measures would apply to a standard residential project. All of the calculations in Table 2 are reduction percentages compared to a 2007 benchmark efficiency. Thus, if a project takes credit for an adopted state or local measure, then it should not take additional credit for the difference between current year GHG efficiency and 2007 because the credit in Table 2 already accounts for potential improvements from 2007 to 2020.

The effect of proponent-proposed measures. The adopted state and local measures will not be sufficient in and of themselves to reduce project level unmitigated emissions by 31%. Thus, project proponents, who do not use the screening tables, will be required to propose and quantify their individual reduction measures. Measures may include energy efficiency, renewable energy, VMT reductions, water conservation strategies that result in emissions more than the unmitigated levels. Proponents should calculate the effectiveness of proposed strategies such that the total of the adopted state and local measures above and the applicant-proposed measures totals a minimum of 31% of the unmitigated emissions. When determining the GHG reduction effectiveness, one may only count reductions that are in excess of the adopted state and local measures noted above. For example, for energy efficiency, all projects will be required to meet Title 24 efficiency standards that are in effect at the time of the project. Thus, additional credit can only be taken if the project’s energy efficiency exceeds Title 24 requirements. Similarly, waste diversion strategies can only provide additional credit if the project will result in greater than 75 percent diversion by 2020 of site generated waste. Finally, caution must be exercised in avoiding double-counting of emissions between adopted state and local measures, improvements in average GHG efficiency between the current year and 2007, and proponent-proposed measures. For this reason, it is recommended that GHG emission estimates only be prepared by qualified air quality experts.

Table 1: Emission Factors to Use for Estimating Unmitigated Emissions

Fuel	Emission Factor	Source
Compressed Natural Gas (CNG) (Vehicle)	0.054 Kg CO ₂ /Standard Ft ³	USEPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006 (2008)
Motor Gasoline (Vehicle)	8.81 Kg CO ₂ /US gal	Provided in the California Local Government Operations Protocol (CARB et al. 2008)
Propane (Vehicle)	5.74 Kg CO ₂ /US gal	
Diesel (Vehicle)	10.15 Kg CO ₂ /US gal	
Natural Gas	0.0546 Kg CO ₂ /Standard Ft ³	
	0.1 g NO ₂ /MMBTU	
	5 g CH ₄ /MMBTU	
Other Fuels	Variable ¹	SQAQMD
Electricity	290.87 kg CO ₂ /MWh	CCAR (2009a) Public Reports and USEPA eGrid2007 (2005 data)
	2.04 kg NO ₂ /GWh	
	13.88 kg CH ₄ /GWh	

Notes:

¹ Other fuels were included in the SCAQMD inventory. Associated emissions are based on emission factors from CARB's Regulation for the Mandatory Reporting of GHG Emissions and fuel High Heating Values (HHVs) from USEPA's AP-42 document.

Reduction Measure Number	Sector	Description	Sectoral percent reduction
R1E1B	Building Energy	RPS-33% by 2020	7.0%
R1E2	Building Energy	AB 1109 Residential Lighting	1.6%
R1E3	Building Energy	AB 1109 Commercial Lighting	1.0%
R1E4	Building Energy	Electricity Energy Efficiency (Title 24)	7.2%
R1E5	Building Energy	Natural Gas Energy Efficiency (Title 24)	0.6%
Building Energy		Subtotal	17.4%
R1T1	Transportation	Pavely I Standards	8.4%
R1T2	Transportation	Pavely II Standards	1.2%
R1T3	Transportation	Low Carbon Fuel Standard	6.7%
R1T4	Transportation	Tire Pressure Program	0.2%
R1T5	Transportation	Low Rolling Resistance Tires	0.1%
R1T6	Transportation	Low Friction Engine Oils	0.8%
R1T7	Transportation	Cool Paint/Reflective	0.3%
R1T9	Transportation	Heavy-Duty Vehicle Efficiency	0.5%
R1T10	Transportation	Med-& Heavy Duty Hybrid.	0.3%
R1T11	Transportation	Rule 1192-Clean Buses	0.03%
R1T12	Transportation	Rule 1195-Clean School Buses	0.03%
Transportation		Subtotal	18.6%
R2W1	Waste	Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills	27.0%
R2W2	Waste	Barstow Methane Recovery	10.6%
R2W3	Waste	Landers Methane Recovery	2.4%
R2W6	Waste	County Diversion Programs — 75 Percent Goal	1.1%
Waste		Subtotal	41.1%
R1WC1	Water Conveyance	RPS-33% by 2020	15.2%
Water Conveyance		Subtotal	15.2%

Reduction Measure Number	Sector	Description	Sectoral percent reduction
<i>R1E1B</i>	<i>Building Energy</i>	<i>RPS-33% by 2020</i>	<i>7.0%</i>
<i>R1E2</i>	<i>Building Energy</i>	<i>AB 1109 Residential Lighting</i>	<i>1.6%</i>
R1E3	Building Energy	AB 1109 Commercial Lighting	1.0%
<i>R1E4</i>	<i>Building Energy</i>	<i>Electricity Energy Efficiency (Title 24)</i>	<i>7.2%</i>
<i>R1E5</i>	<i>Building Energy</i>	<i>Natural Gas Energy Efficiency (Title 24)</i>	<i>0.6%</i>
<i>R1T1</i>	<i>Transportation</i>	<i>Pavely I Standards</i>	<i>8.4%</i>
<i>R1T2</i>	<i>Transportation</i>	<i>Pavely II Standards</i>	<i>1.2%</i>
<i>R1T3</i>	<i>Transportation</i>	<i>Low Carbon Fuel Standard</i>	<i>6.7%</i>
<i>R1T4</i>	<i>Transportation</i>	<i>Tire Pressure Program</i>	<i>0.2%</i>
<i>R1T5</i>	<i>Transportation</i>	<i>Low Rolling Resistance Tires</i>	<i>0.1%</i>
<i>R1T6</i>	<i>Transportation</i>	<i>Low Friction Engine Oils</i>	<i>0.8%</i>
<i>R1T7</i>	<i>Transportation</i>	<i>Cool Paint/Reflective</i>	<i>0.3%</i>
R1T9	Transportation	Heavy-Duty Vehicle Efficiency	0.5%
R1T10	Transportation	Med-& Heavy Duty Hybrid.	0.3%
R1T11	Transportation	Rule 1192-Clean Buses	0.03%
R1T12	Transportation	Rule 1195-Clean School Buses	0.03%
<i>R2W1</i>	<i>Waste</i>	<i>Increase Methane Recovery at Mid-Valley, Milliken, and Colton Landfills</i>	<i>27.0%</i>
<i>R2W2</i>	<i>Waste</i>	<i>Barstow Methane Recovery</i>	<i>10.6%</i>
<i>R2W3</i>	<i>Waste</i>	<i>Landers Methane Recovery</i>	<i>2.4%</i>
<i>R2W6</i>	<i>Waste</i>	<i>County Diversion Programs — 75 Percent Goal</i>	<i>1.1%</i>
<i>R1WC1</i>	<i>Water Conveyance</i>	<i>RPS-33% by 2020</i>	<i>15.2%</i>

RESOURCES

California Climate Action Registry. General Reporting Protocol. Public Reports for Reporting Entities

<http://www.climateregistry.org>

California Energy Commission. Refining Estimates of Water-Related Energy use in California.

http://www.energy.ca.gov/pier/project_reports/CEC-500-2006-118.html

EMFAC. Factor model for onroad mobile emissions sources from the California Air Resources Board.

http://www.arb.ca.gov/msei/onroad/latest_version.htm

OFFROAD. Model for factors for offroad equipment from the California Air Resources Board.

<http://www.arb.ca.gov/msei/offroad/offroad.htm>

CalEEMod. Public domain software for calculation criteria pollutant and GHG emissions from land use projects.

<http://www.caleemod.com>

ATTACHMENT 4:

GHG Emission Reduction Calculations for Accessory Renewable Energy Projects

ACCESSORY RENEWABLE ENERGY PROJECTS

The GHG Plan included a GHG Reduction Measure (R3E14) that accounted for small wind energy systems that the County was permitting. These small wind energy systems as well as small photovoltaic energy systems within unincorporated San Bernardino County required a permit by the County. These systems were typically 10 kilowatts (kW) in size and were not regulated by the California Energy Commission (CEC) and did not count toward the utilities renewable portfolio or the State's R1 measures for renewable energy. At the time that the GHG Plan was drafted (2009), the County did not have estimated generation within unincorporated County areas from these systems and could not estimate the GHG reductions from these types of systems. However, the County saw these renewable energy systems as a potential GHG reducing mechanism and wanted to continue permitting such systems and encourage growth in these systems. Therefore the GHP Plan listed the small wind energy systems as well as small photovoltaic energy systems permitting process as an R3 measure that could not include GHG emission reductions calculations.

Since that time, the County has reviewed permitting records and determined the number of these permits issued since 2007. The records indicate the following:

Year 2007: 27 permits issued

Year 2008: 24 permits issued

Year 2009: 25 permits issued

Year 2010: 37 permits issued (permit fees were due to go up July 1, 2010 accounting for the increase in permits being issued in this year)

Systems permitted prior to 2007 were considered within the baseline energy use for the External GHG Inventory and not counted in this analysis. In total, 113 10kW Wind Energy Systems were permitted between 2007 and 2010. Taking out year 2010, on average 25 to 26 permits are issued per year. Year 2010 was taken out of the average because of the spike in permits likely caused by the fee increase. In predicting the number of systems in place by 2020 using these records, approximately 250 permits would be issued between 2010 and 2020 plus the existing 113 units currently operating gives a combined total of 363 wind energy units. Each unit is estimated to account for 22.12 MTCO₂e per year in GHG reductions. Total reductions expected from these wind energy systems in year 2020 is **8,030.89 MTCO₂e per year**. The calculations of the wind turbine systems generation and GHG emission reductions are shown on the spreadsheet on the following page.

About half this many photovoltaic systems were also permitted by the County (average of 13 per year). A conservative analysis in the emission reductions from these systems estimates at least 127.41 MTCO₂e per year assuming 130 systems in place by year 2020 and slightly less than one metric ton CO₂e being

DEVELOPMENT REVIEW PROECESS

reduced. These estimates are extremely conservative due to the lack of additional data on PV systems and the actual electric generating capacity and emissions reduction from PV is likely much higher.

Insert Energy spreadsheet here.

