

4.5 GLOBAL CLIMATE CHANGE

SUMMARY

This global climate change assessment for the proposed Via Princessa East Extension project (“project” or “proposed project”), located in the City of Santa Clarita, California, was prepared in accordance with the South Coast Air Quality Management District’s (SCAQMD) California Environmental Quality Act (CEQA) *Air Quality Handbook* and other guidance and other guidance provided by the SCAQMD, which the City has adopted for purposes of CEQA analysis and thresholds of significance. The proposed project consists of the extension of the Via Princessa roadway to make it one of the primary east-west arterials through the City of Santa Clarita. The project is about 1.2 miles in length and would be a six-lane roadway with sidewalks on each side of the roadway and would include a two-lane bike path along the south side.

The criteria for determining the significance of impacts related to greenhouse gas (GHG) emissions are provided in the environmental checklist form in Appendix G of the *State CEQA Guidelines*. As of this date, neither the SCAQMD Governing Board nor the County has formally adopted a significance threshold for assessing the impacts from a residential or commercial project’s GHG emissions. The SCAQMD has formed a Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group in order to provide guidance to local lead agencies on determining significance of GHG emissions in CEQA documents. The Working Group has released draft recommendations that suggest evaluating projects using a screening level of GHG emissions. Projects that do not exceed the screening level would be considered less than significant. Projects that exceed the screening level would be required to implement mitigation measures to reduce the emissions. Although a significance threshold has not been formally adopted, the Working Group draft recommendations represent the best available information with which to evaluate the project’s significance with respect to GHG emissions and climate change. The impacts associated with construction and operation of the proposed project were compared to the draft recommended screening levels.

Based on the results of the global climate change assessment, construction and operational emissions of the proposed project would not exceed the SCAQMD Working Group draft recommended screening level 3,000 metric tons of carbon dioxide equivalents (MTCO_{2e}) per year. Furthermore, the project would not conflict with applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of greenhouse gases. The project would result in impacts to GHG emissions and climate change that would be considered less than significant.

INTRODUCTION

This section describes the current state of the regulations and programs that have been implemented to address GHG emissions and global climate change in California. This section also identifies the plans and policies developed by federal, state, and local authorities to reduce GHG emissions. Inventories of GHG emissions associated with implementation of the proposed project are identified and discussed. Potential GHG emissions and climate change impacts associated with the proposed project are evaluated based on the thresholds of significance. Sources utilized in this discussion include the SCAQMD *CEQA Air Quality Handbook* (CEQA Handbook), *Air Quality Analysis Guidance Handbook* (Guidance Handbook), and air quality data from the SCAQMD, the California Air Resources Board (CARB), and the United States Environmental Protection Agency (US EPA).

Emission calculations were obtained from the Roadway Construction Emissions Model, Version 6.3.2, which was developed by the Sacramento Metropolitan Air Quality Management District (SMAQMD).¹ The Roadway Construction Emissions Model is used to assess the emissions from linear construction projects, such as roadways. The model incorporated factors from CARB's EMFAC2007 on-road vehicle emissions model and CARB's OFFROAD2007 off-road vehicle emissions model. Both EMFAC2007 and OFFROAD2007 contain the most up-to-date emission factors for on-road and off-road vehicles. The Roadway Construction Emissions Model is approved for use by the SCAQMD for estimating air pollutant emissions for environmental analyses pursuant to CEQA.² Electricity GHG emissions related to street lighting and traffic signals were obtained from data from the US Department of Energy and the California Climate Action Registry. GHG emission calculations prepared for the proposed project are provided in **Appendix 4.5**.

REGULATORY SETTING

Federal

In *Massachusetts v. EPA*, the Supreme Court held that the US EPA has the statutory authority under Section 202 of the Clean Air Act (CAA) to regulate GHGs from new motor vehicles. The Court did not hold that the US EPA was required to regulate greenhouse gas emissions; however, it indicated that the agency must decide whether GHGs from motor vehicles cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Upon the final decision, the President signed

¹ Sacramento Metropolitan Air Quality Management District, *Roadway Construction Emissions Model Version 6.3.2*, (2009). The model may be downloaded from the following website: <http://www.airquality.org/ceqa/index.shtml>.

² Spoken communication with Daniel Garcia, air quality specialist at SCAQMD. The Sacramento Metropolitan Air Quality Management's Roadway Construction Emissions Model can be used as long as emission factors are current and accurate.

Executive Order 13432 on May 14, 2007, directing the US EPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision.

On September 15, 2009, the US EPA and the Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. The proposed standards would be phased in and would require passenger cars and light-duty trucks to comply with a declining emission standard. In 2012, passenger cars and light-duty trucks would have to meet an average emission standard of 295 grams of CO₂ per mile and 30.1 miles per gallon.³ By 2016, the vehicles would have to meet a standard of 250 grams of CO₂ per mile and 35.5 miles per gallon.⁴ The final standards were adopted by the US EPA and DOT on April 1, 2010.

On December 7, 2009, the US EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution that threatens public health and welfare.

While these findings do not impose any requirements on industry or other entities, this action is a prerequisite to finalizing the US EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by the US EPA and the NHTSA. On April 1, 2010, the US EPA and NHTSA issued final rules requiring that by the 2016 model-year, manufacturers must achieve a combined average vehicle emission level of 250 grams of CO₂ per mile, which is equivalent to 35.5 miles per gallon as measured by US EPA standards. These agencies are currently in the process of developing similar regulations for the 2017-2025 model years, which are expected to be drafted by September 2011.

³ US Environmental Protection Agency, "EPA and NHTSA Propose Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks," <http://epa.gov/otaq/climate/regulations/420f09047a.htm>. 2009.

⁴ US EPA, "EPA and NHTSA Propose Historic Nation Program," 2009.

State

Assembly Bill 1493

In response to the transportation sector's contribution of more than half of California's CO₂ emissions, Assembly Bill 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 requires CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles whose primary use is noncommercial personal transportation. The bill requires CARB to set the GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. In setting these standards, CARB is required to consider cost-effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. CARB adopted the statutorily mandated standards in September 2004. When fully phased in, the near-term (2009–2012) standards would result in about a 22 percent reduction in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards would result in a reduction of about 30 percent.

Before these regulations go into effect, the US EPA must grant California a waiver under the federal CAA, which ordinarily preempts state regulation of motor vehicle emission standards. On June 30, 2009, the US EPA formally approved California's waiver request. However, in light of the September 15, 2009 announcement by the US EPA and NHTSA regarding the national program to reduce vehicle GHG emissions, California—and states adopting California emissions standards—have agreed to generally defer to the proposed national standard through model year 2016. The 2016 endpoint of the two standards is similar, although the national standard ramps up slightly more slowly than required under the Pavley standards. The Pavley standards require additional reductions in CO₂ emissions beyond 2016 (referred to as Phase II standards). While the Phase II standards have yet to be fully developed, the state currently intends to pursue additional reductions from motor vehicles for model years 2017 through 2025 timeframe. CARB is working with the US EPA and the NHTSA and these agencies are currently in the process of developing regulations for the 2017–2025 model years, which are expected to be drafted in late 2011.

Executive Order S-3-05 and the Climate Action Team

In June 2005, the Governor established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to year 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The Secretary of the California Environmental Protection Agency (Cal/EPA) is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agency representatives involved in the GHG reduction plan include the Secretary of the Business, Transportation and Housing

Agency, the Secretary of the Department of Food and Agriculture, the Secretary of the Resources Agency, the Chairperson of CARB, the Chairperson of the California Energy Commission (CEC), and the President of the Public Utilities Commission. Representatives from these agencies comprise the Climate Action Team.

The Climate Action Team is responsible for implementing global warming emissions reduction programs. The Cal/EPA secretary is required to submit a biannual progress report from the Climate Action Team to the governor and state legislature disclosing the progress made toward GHG emission reduction targets and the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and reporting possible mitigation and adaptation plans to combat these impacts. The Climate Action Team has fulfilled both of these report requirements through its March 2006 Climate Action Team Report (CAT Report) to Governor Schwarzenegger and the Legislature and subsequent reports in 2007, 2008, 2009, and 2010.⁵

The 2006 CAT Report identified key measures that will help ensure that California will meet the GHG reduction goals established under the Governor's Executive Order S-3-05 (1990 levels by 2020 and 80 percent below 1990 levels by 2050). These key measures include establishing a market-based carbon trading system, mandatory GHG reporting for large emitters, production of alternative transportation fuels, energy efficiency and renewable portfolio standards for utilities, emission reporting protocols for local governments, establishing a public goods charge for transportation that funds key strategies to reduce climate change emissions, and leveraging California's universities to train the next generation of workers needed to service new technologies.

The 2009 CAT Biennial Report expands on the policies from the 2006 assessment and provides new information and scientific findings. New information and details in the 2009 CAT Biennial Report include (1) development of new climate and sea-level projections using new information and tools that have become available in the last two years; and (2) evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts. The 2010 CAT Report provides the updated information on research, mitigation, adaptation, and joint actions from State of California efforts to reduce GHG emissions and adapt to climate change.

Assembly Bill 32

In furtherance of the goals established in Executive Order S-3-05, the State Legislature enacted AB 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor

⁵ California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, (2010). Reports may be downloaded from the following website: <http://www.climatechange.ca.gov/publications/cat/>.

Schwarzenegger signed on September 27, 2006. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries with penalties for noncompliance. AB 32 requires the state to undertake several actions—the major requirements are discussed below.

CARB Early Action Measures

CARB is responsible for carrying out and developing the programs and requirements necessary to achieve the goals of AB 32—the reduction of California's GHG emissions to 1990 levels by 2020. The first action under AB 32 resulted in CARB's adoption of three early action greenhouse gas emission reduction measures on June 21, 2007. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. CARB has adopted regulations for all early action measures. The early action measures are divided into three categories:

- Group 1 - GHG rules for immediate adoption and implementation
- Group 2 - Several additional GHG measures under development
- Group 3 - Air pollution controls with potential climate co-benefits

The original three adopted early action regulations meeting the narrow legal definition of “discrete early action GHG reduction measures” include

- a low-carbon fuel standard to reduce the “carbon intensity” of California fuels;
- the reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of “do-it-yourself” automotive refrigerants; and
- increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early action regulations adopted on October 25, 2007, also meeting the narrow legal definition of “discrete early action GHG reduction measures,” include

- the reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
- the reduction of auxiliary engine emissions of docked ships by requiring port electrification;
- the reduction of perfluorocarbons from the semiconductor industry;
- the reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products);
- the requirement that all tune-up, smog check and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency; and
- the restriction on the use of sulfur hexafluoride from non-electricity sectors if viable alternatives are available.

State of California 1990 Greenhouse Gas Inventory and 2020 Limit

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 million metric tons carbon dioxide equivalent (MMTCO_{2e}). CARB also projected the state's 2020 GHG emissions under "business as usual" (BAU) conditions—that is, emissions that would occur without any plans, policies, or regulations to reduce GHG emissions. CARB used an average of the state's GHG emissions from 2002 through 2004 and projected the 2020 levels based on population and economic forecasts. The projected net emissions totaled approximately 596 MMTCO_{2e}. Therefore, the state must reduce its 2020 BAU emissions by approximately 29 percent in order to meet the 1990 target.

The inventory revealed that in 1990, transportation, with 35 percent of the state's total emissions, was the largest single sector, followed by industrial emissions, 24 percent; imported electricity, 14 percent; in-state electricity generation, 11 percent; residential use, 7 percent; agriculture, 5 percent; and commercial uses, 3 percent. AB 32 does not require individual sectors to meet their individual 1990 GHG emissions inventory; the total statewide emissions are required to meet the 1990 threshold by 2020.

AB 32 Climate Change Scoping Plan

As indicated above, AB 32 requires CARB to adopt a scoping plan indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions. After receiving public input on their discussion draft of the Proposed Scoping Plan released in June 2008, CARB released the Climate Change Proposed Scoping Plan in October 2008 that contains an outline of the proposed state strategies to achieve the 2020 GHG limits. The CARB Governing Board approved the Scoping Plan on December 11, 2008. Key elements of the Scoping Plan include the following recommendations:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation

Under the Scoping Plan, approximately 85 percent of the state’s emissions are subject to a cap-and-trade program where covered sectors are placed under a declining emissions cap. The emissions cap incorporates a margin of safety whereas the 2020 emissions limit will still be achieved even in the event that uncapped sectors do not fully meet their anticipated emission reductions. Emissions reductions will be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. It is expected that emission reduction from this cap-and-trade program will account for a large portion of the reductions required by AB 32.

Table 4.5-1, AB 32 Scoping Plan Measures, lists CARB’s preliminary recommendations for achieving greenhouse gas reductions under AB 32 along with a brief description of the requirements and applicability.

**Table 4.5-1
AB 32 Scoping Plan Measures**

Scoping Plan Measure	Description
SPM-1: California Cap-and-Trade Program linked to Western Climate Initiative	Implement a broad-based cap-and-trade program that links with other Western Climate Initiative Partner programs to create a regional market system. Ensure California’s program meets all applicable AB 32 requirements for market-based mechanisms. Capped sectors include transportation, electricity, natural gas, and industry. Projected 2020 business-as-usual emissions are estimated at 512 MTCO _{2e} ; preliminary 2020 emissions limit under cap-and-trade program are estimated at 365 MTCO _{2e} (29 percent reduction).
SPM-2: California Light-Duty Vehicle GHG Standards	Implement adopted Pavley standards and planned second phase of the program. AB 32 states that if the Pavley standards (AB 1493) do not remain in effect, CARB shall implement equivalent or greater alternative regulations to control mobile sources.
SPM-3: Energy Efficiency	Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts. The Proposed Scoping Plan considers green building standards as a framework to achieve reductions in other sectors, such as electricity.
SPM-4: Renewables Portfolio Standard	Achieve 33 percent Renewable Portfolio Standard by both investor-owned and publicly owned utilities.
SPM-5: Low Carbon Fuel Standard	CARB identified the Low Carbon Fuel Standard as a Discrete Early Action item and the final regulation was adopted on April 23, 2009. In January 2007, Governor Schwarzenegger issued Executive Order S-1-07, which called the reduction of the carbon intensity of California’s transportation fuels by at least 10 percent by 2020.
SPM-6: Regional Transportation-Related Greenhouse Gas Targets	Develop regional greenhouse gas emissions reduction targets for passenger vehicles. Senate Bill 375 (SB 375) requires CARB to develop, in consultation with metropolitan planning organizations, passenger vehicle greenhouse gas emissions reduction targets for 2020 and 2035 by September 30, 2010. SB 375 requires metropolitan planning organizations to prepare a sustainable communities strategy to reach the regional target provided by CARB.
SPM-7: Vehicle Efficiency Measures	Implement light-duty vehicle efficiency measures. CARB is pursuing fuel-efficient tire standards and measures to ensure properly inflated tires during vehicle servicing.

Scoping Plan Measure	Description
SPM-8: Goods Movement	Implement adopted regulations for port drayage trucks and the use of shore power for ships at berth. Improve efficiency in goods movement operations.
SPM-9: Million Solar Roofs Program	Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
SPM-10: Heavy/Medium-Duty Vehicles	Adopt heavy- and medium-duty vehicle and engine measures. Measures targeting aerodynamic efficiency, vehicle hybridization, and engine efficiency are recommended.
SPM-11: Industrial Emissions	Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
SPM-12: High Speed Rail	Support implementation of a high-speed rail system. This measure supports implementation of plans to construct and operate a high-speed rail system between Northern and Southern California serving major metropolitan centers.
SPM-13: Green Building Strategy	Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
SPM-14: High Global Warming Potential Gases	Adopt measures to reduce high global warming potential gases. The Proposed Scoping Plan contains six measures to reduce high global warming potential gases from mobile sources, consumer products, stationary sources, and semiconductor manufacturing.
SPM-15: Recycling and Waste	Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.
SPM-16: Sustainable Forests	Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The federal government and California's Board of Forestry and Fire Protection have the regulatory authority to implement the Forest Practice Act to provide for sustainable management practices. This measure is expected to play a greater role in the 2050 goals.
SPM-17: Water	Continue efficiency programs and use cleaner energy sources to move water. California will also establish a public goods charge for funding investments in water efficiency that will lead to as yet undetermined reductions in greenhouse gases.
SPM-18: Agriculture	In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020. Increase efficiency and encourage use of agricultural biomass for sustainable energy production. CARB has begun research on nitrogen fertilizers and will explore opportunities for emission reductions.

Source: California Air Resources Board, *Climate Change Scoping Plan*, (2008).

Executive Order S-1-07 (Low Carbon Fuel Standard)

On January 18, 2007, California further solidified its dedication to reducing GHGs by setting a new Low Carbon Fuel Standard (LCFS) for transportation fuels sold within the state. Executive Order S-1-07 sets a declining standard for GHG emissions measured in CO₂-equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels

by at least 10 percent by 2020. The LCFS will apply to refiners, blenders, producers, and importers of transportation fuels and will use market-based mechanisms to allow these providers to choose how they reduce emissions during the “fuel cycle” using the most economically feasible methods. The executive order requires the Secretary of Cal/EPA to coordinate with the CEC, CARB, the University of California, and other agencies to develop a protocol to measure the “life-cycle carbon intensity” of transportation fuels. CARB released a draft version of the LCFS in October 2008 and adopted the final regulation on April 23, 2009.

Senate Bill 97

In August 2007, the legislature enacted Senate Bill 97 (SB 97) (Dutton), which directed the Governor’s Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of greenhouse gas emissions. A number of actions have taken place under SB 97, which are discussed below.

OPR Climate Change Technical Advisory

On June 19, 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents.⁶ The advisory indicated that a project’s GHG emissions, including those associated with vehicular traffic, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures that are necessary to reduce GHG emissions to a less than significant level. The advisory did not recommend a specific threshold of significance.

CEQA Guidelines Amendments

As part of its formulation of CEQA Guidelines Amendments for GHG emissions, OPR submitted the *Proposed Draft CEQA Guidelines Amendments for Greenhouse Gas Emissions* to the Secretary for Natural Resources on April 13, 2009. The Natural Resources Agency conducted formal rulemaking procedures in 2009 and adopted the CEQA Guidelines Amendments on December 30, 2009.

Senate Bill 375

The California Legislature passed SB 375 on September 1, 2008, and SB 375 was signed by Governor Schwarzenegger and chaptered into law on September 30, 2008. SB 375 requires CARB, working in consultation with the metropolitan planning organizations (MPOs), to set regional greenhouse gas reduction targets for the automobile and light truck sector for 2020 and 2035. SB 375 required CARB to

⁶ Governor’s Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, (2008).

provide each MPO with its reduction target by September 30, 2010. The target must then be incorporated within that region's Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain transportation planning and programming activities would then need to be consistent with the SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

In accordance with SB 375, on January 23, 2009, CARB appointed a Regional Targets Advisory Committee (RTAC) to provide recommendations and methodologies to be used in the target setting process. The RTAC provided its recommendations in a report to CARB on September 29, 2009. On August 9, 2010, CARB staff issued *Proposed Regional Greenhouse Gas Emission Reduction Targets For Automobiles And Light Trucks Pursuant To Senate Bill 375*.⁷ CARB staff proposed draft per capita reduction targets for the four largest MPOs (Bay Area, Sacramento, Southern California, and San Diego) of 7 to 8 percent for 2020 and reduction targets between 13 to 16 percent for 2035. For the Southern California Association of Governments (SCAG), which is the MPO for the region the City of Santa Clarita is located, CARB established a draft target of 8 percent for 2020 and 13 percent for 2035. Of note, the proposed reduction targets explicitly exclude emission reductions expected from the AB 1493 and low carbon fuel standard regulations. CARB adopted the final targets, with some modifications, on September 23, 2010. The 13 percent target for SCAG was made conditional on based on discussions with SCAG.

Local

South Coast Air Quality Management District

In April 2008, the SCAQMD, in order to provide guidance to local lead agencies on determining the significance of GHG emissions identified in CEQA documents, convened a "GHG CEQA Significance Threshold Working Group."⁸ The goal of the working group is to develop and reach consensus on an acceptable CEQA significance threshold for GHG emissions that would be utilized on an interim basis until CARB (or some other state agency) develops statewide guidance on assessing the significance of GHG emissions under CEQA.

In December 2008, staff presented the SCAQMD Governing Board with a significance threshold for stationary source projects where it is the lead agency. This threshold uses a tiered approach to determine a project's significance, with 10,000 metric tons of carbon dioxide equivalent (MTCO_{2e}) as a numerical

⁷ California Air Resources Board, *Staff Report: Proposed Regional Greenhouse Gas Emission Reduction Targets For Automobiles And Light Trucks Pursuant To Senate Bill 375*, (2010).

⁸ For more information see: <http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html>.

screening threshold. The Governing Board adopted this screening threshold for industrial and stationary source projects where it is the lead agency.

At present time, the SCAQMD has not adopted thresholds for projects such as the one analyzed in this Draft Environmental Impact Report (EIR). The SCAQMD Working Group has released draft recommendations for screening levels of GHG emissions. According to the draft, all land use projects that do not exceed a screening threshold of 3,000 MTCO_{2e} or 4.8 MTCO_{2e} per service population per year would be considered to result in a less than significant impact with respect to GHG emissions. If a project exceeds these screening thresholds, the Working Group's draft documents recommend that projects reduce their emissions via project design features and mitigation measures. Projects may optionally demonstrate GHG reductions from a base case scenario, which includes any applicable land use sector reductions from AB 32. While the SCAQMD has not adopted these thresholds, it is possible that the SCAQMD will adopt them, or similar thresholds, at some future date. Therefore, while it is recognized that methodologies to evaluate GHG emissions are still under development and could change in the future, this analysis relies on the information contained in the SCAQMD's draft guidance documents, as described above.

The SCAQMD also has adopted Rules 2700, 2701, and 2702 that address GHG reductions; however, these rules are currently applicable to boilers and process heaters, forestry, and manure management projects.

EXISTING CONDITIONS

Background

Global climate change refers to any significant change in climate measurements, such as temperature, precipitation, or wind, lasting for an extended period (i.e., decades or longer).⁹ Climate change may result from

- natural factors, such as changes in the sun's intensity or gradual changes in the Earth's orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation, reduction in sunlight from the addition of GHG and other gases to the atmosphere from volcanic eruptions); and
- human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification).

⁹ US Environmental Protection Agency, "Glossary of Climate Change Terms," http://www.epa.gov/climatechange/glossary.html#Climate_change. 2008.

The natural process through which heat is retained in the troposphere¹⁰ is called the “greenhouse effect.” The greenhouse effect traps heat in the troposphere through a three-fold process as follows: (1) short-wave radiation in the form of visible light emitted by the Sun is absorbed by the Earth as heat; (2) long-wave radiation is re-emitted by the Earth; and (3) GHGs in the upper atmosphere absorb or trap the long-wave radiation and re-emit it back towards the Earth and into space. This third process is the focus of current climate change actions.

While water vapor and carbon dioxide (CO₂) are the most abundant GHGs, other trace GHGs have a greater ability to absorb and re-radiate long-wave radiation. To gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-emit long-wave radiation over a specific period. The GWP of a gas is determined using CO₂ as the reference gas, with a GWP of 1 over 100 years. For example, a gas with a GWP of 10 is 10 times more potent than CO₂ over 100 years. The use of GWP allows GHG emissions to be reported using CO₂ as a baseline. The sum of each GHG multiplied by its associated GWP is referred to as carbon dioxide equivalents (CO₂e). This essentially means that 1 metric ton of a GHG with a GWP of 10 has the same climate change impact as 10 metric tons of CO₂.

Greenhouse Gases

State law defines GHGs to include the following compounds:¹¹

- **Carbon Dioxide (CO₂).** CO₂ is primarily generated from fossil fuel combustion from stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources over the past 250 years, the concentration of CO₂ in the atmosphere has increased 35 percent.¹² CO₂ is the most widely emitted GHG and is the reference gas (GWP of 1) for determining the GWPs of other GHGs.
- **Methane (CH₄).** Methane is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas

¹⁰ The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth’s surface to 10 to 12 kilometers.

¹¹ All Global Warming Potentials are given as 100-year values. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. *Climate Change 1995: The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge (UK): Cambridge University Press, (1996).

¹² United States Environmental Protection Agency, “Inventory of US Greenhouse Gas Emissions and Sinks 1990-2006,” <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>. 2008.

systems, and enteric fermentation.¹³ Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.

- **Nitrous Oxide (N₂O).** N₂O is produced by natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.
- **Hydrofluorocarbons (HFCs).** HFCs typically are used as refrigerants in both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, particularly as the continued phase-out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWPs of HFCs ranges from 140 for HFC-152a to 11,700 for HFC-23.
- **Perfluorocarbons (PFCs).** Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a Global Warming Potential several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).¹⁴ The GWPs of PFCs range from 5,700 to 11,900.
- **Sulfur Hexafluoride (SF₆).** Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio, as compared to CO₂ (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm] of CO₂).¹⁵

The primary GHGs of concern relative to the proposed project are CO₂, CH₄, and N₂O. These three GHGs are generally emitted from combustion activities. HFCs may also be emitted from accidental releases from refrigeration or air conditioning equipment. The other GHGs listed above are related to specific industrial uses and not anticipated to be emitted in measurable or substantial quantities by the project.

Contributions to Greenhouse Gases

Global

Worldwide anthropogenic (man-made) GHG emissions are tracked for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Man-made GHG emissions for Annex I nations are available through 2007. Man-made GHG emissions for Non-Annex I nations are available

¹³ United States Environmental Protection Agency, "Methane: Sources and Emissions," <http://www.epa.gov/methane/sources.html>. n.d.

¹⁴ Energy Information Administration, "Other Gases: Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride," http://www.eia.doe.gov/oiaf/1605/gg00rpt/other_gases.html. n.d.

¹⁵ US Environmental Protection Agency, "High GWP Gases and Climate Change," <http://www.epa.gov/highgwp/scientific.html#sf6>. n.d.

through 2005. The sum of these emissions totaled approximately 44,272 million metric tons of CO₂ equivalents (MMTCO_{2e}).¹⁶ It should be noted that global emissions inventory data are not all from the same year and may vary depending on the source of the emissions inventory data.¹⁷ Emissions from the top five countries and the European Union accounted for approximately 57 percent of the total global GHG emissions, according to the most recently available data (see **Table 4.5-2, Top Five GHG Producer Countries and the European Union**). The GHG emissions in more recent years may differ from the inventories presented in **Table 4.5-2**; however, the data is representative of currently available inventory data.

**Table 4.5-2
Top Five GHG Producer Countries and the European Union**

Emitting Countries	GHG Emissions (MMTCO _{2e})
China	7,264
United States	7,249
European Union (EU), 27 Member States	5,362
Russian Federation	2,197
India	1,870
Japan	1,407
Total	25,349

Source: World Resources Institute, "Climate Analysis Indicators Tool (CAIT)," <http://cait.wri.org/>. 2011.

Excludes emissions and removals from land use, land-use change, and forestry (LULUCF).

Note: Emissions for Annex I nations are based on 2007 data. Emissions for Non-Annex I nations (e.g., China, India) are based on 2005 data).

United States

As noted in **Table 4.5-1**, the United States was the number two producer of GHG emissions worldwide. The primary GHG emitted by human activities in the United States was CO₂, representing approximately

¹⁶ The CO₂ equivalent emissions commonly are expressed as "million metric tons of carbon dioxide equivalent (MMTCO_{2e})." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP, such that MMTCO_{2e} = (million metric tons of a GHG) × (GWP of the GHG). For example, the GWP for methane is 21. This means that the emission of one million metric tons of methane is equivalent to the emission of 21 million metric tons of CO₂.

¹⁷ The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2007 data, the data for the most recent year were used.

85 percent of total GHG emissions.¹⁸ Carbon dioxide from fossil fuel combustion, the largest source of US GHG emissions, accounted for approximately 80 percent of the GHG emissions.¹⁹

State of California

CARB compiles GHG inventories for the State of California. Based upon the 2008 GHG inventory data (i.e., the latest year for which data are available) for the 2000–2008 greenhouse gas emissions inventory, California emitted 474 MMTCO₂e including emissions resulting from imported electrical power in 2008.²⁰ Based on the CARB inventory data and GHG inventories compiled by the World Resources Institute, California’s total statewide GHG emissions rank second in the United States (Texas is number one) with emissions of 417 MMTCO₂e excluding emissions related to imported power.²¹

The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. **Table 4.5-3, GHG Emissions in California**, provides a summary of GHG emissions reported in California in 1990 and 2008 separated by categories defined by the United Nations Intergovernmental Panel on Climate Change (IPCC).

Between 1990 and 2008, the population of California grew by approximately 8.1 million (from 29.8 to 37.9 million).²² This represents an increase of approximately 27.2 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from \$788 billion in 1990 to \$1.8 trillion in 2008 representing an increase of approximately 128 percent (over twice the 1990 gross state product).²³ Despite the population and economic growth, California’s net GHG emissions only grew by approximately 11 percent. The CEC attributes the slow rate of growth to the success of California’s renewable energy programs and its commitment to clean air and clean energy.²⁴

¹⁸ US Environmental Protection Agency, “Inventory of US Greenhouse Gas Emissions and Sinks 1990–2008,” <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>. 2010.

¹⁹ US EPA, “Inventory of US Greenhouse Gas Emissions and Sinks 1990–2008,” 2010.

²⁰ California Air Resources Board, “California Greenhouse Gas 2000–2008 Inventory by Scoping Plan Category - Summary,” <http://www.arb.ca.gov/cc/inventory/data/data.htm>. 2010.

²¹ California Air Resources Board, “California Greenhouse Gas 2000–2008 Inventory by Scoping Plan Category - Summary,” <http://www.arb.ca.gov/cc/inventory/data/data.htm>.

²² US Census Bureau, “Data Finders,” <http://www.census.gov/>. 2009; California Department of Finance, “E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark,” <http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2009/>. 2010.

²³ California Department of Finance, “Financial & Economic Data: Gross Domestic Product, California,” http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/FS_Misc.htm. 2010. Amounts are based on current dollars as of the date of the report (June 2, 2009).

²⁴ California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*, (2006).

**Table 4.5-3
GHG Emissions in California**

Source Category	1990 (MMTCO₂e)¹	Percent of Total	2008 (MMTCO₂e)²	Percent of Total
ENERGY	386.41	89.2%	413.80	86.6%
Energy Industries	157.33	36.3%	171.23	35.8%
Manufacturing Industries & Construction	24.24	5.6%	16.67	3.5%
Transport	150.02	34.6%	173.94	36.4%
Other (Residential/Commercial/Institutional)	48.19	11.1%	46.59	9.8%
Non-Specified	1.38	0.3%	0.00	0.0%
Fugitive Emissions from Oil & Natural Gas	2.94	0.7%	3.28	0.7%
Fugitive Emissions from Other Energy Production	2.31	0.5%	2.09	0.4%
INDUSTRIAL PROCESSES & PRODUCT USE	18.34	4.2%	30.11	6.3%
Mineral Industry	4.85	1.1%	5.35	1.1%
Chemical Industry	2.34	0.5%	0.06	0.0%
Non-Energy Products from Fuels & Solvent Use	2.29	0.5%	1.97	0.4%
Electronics Industry	0.59	0.1%	0.80	0.2%
Substitutes for Ozone Depleting Substances	0.04	0.0%	13.89	2.9%
Other Product Manufacture and Use	3.18	0.7%	1.66	0.3%
Other	5.05	1.2%	6.39	1.3%
AGRICULTURE, FORESTRY, & OTHER LAND USE	19.11	4.4%	24.42	5.1%
Livestock	11.67	2.7%	16.28	3.4%
Land	0.19	0.0%	0.19	0.0%
Aggregate Sources & Non-CO ₂ Sources on Land	7.26	1.7%	7.95	1.7%
WASTE	9.42	2.2%	9.41	2.0%
Solid Waste Disposal	6.26	1.4%	6.71	1.4%
Wastewater Treatment & Discharge	3.17	0.7%	2.70	0.6%
EMISSIONS SUMMARY				
Gross California Emissions	433.29		477.74	
Sinks from Forests and Rangelands	-6.69		-3.98	
Net California Emissions	426.60		473.76	

¹ California Air Resources Board, "California Greenhouse Gas 1990–2004 Inventory by IPCC Category - Summary," <http://www.arb.ca.gov/cc/inventory/archive/archive.htm>. 2010.

² California Air Resources Board, "California Greenhouse Gas 2000–2008 Inventory by IPCC Category - Summary," <http://www.arb.ca.gov/cc/inventory/data/data.htm>. 2010.

Global Ambient CO₂ Concentrations

Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of carbon dioxide, methane, and nitrous oxide from before the start of the industrialization, around 1750, to over 650,000 years ago. For that period, it was found that carbon dioxide concentrations ranged from 180 parts per million (ppm) to 300 ppm. For the period from around 1750 to the present, global carbon dioxide concentrations increased from a pre-industrialization period concentration of 280 ppm to 379 ppm in 2005, with the 2005 value far exceeding the upper end of the pre-industrial period range.²⁵ Recent values continue this upward trend. Global methane and nitrous oxide concentrations show similar increases for the same period (see **Table 4.5-4, Comparison of Global Pre-Industrial and Current GHG Concentrations**).

**Table 4.5-4
Comparison of Global Pre-Industrial and Current GHG Concentrations**

Greenhouse Gas	Natural Range for Last 650,000 Years¹ (ppm)	Year 1750 Concentrations (Early Industrial Period)¹ (ppm)	Year 2005 Concentrations¹ (ppm)	Year 2010 Concentrations^{2,3} (ppm)
Carbon Dioxide (CO ₂)	180 to 300	280	379	390
Methane (CH ₄)	0.320 to 0.790	0.715	1.774	1.870 / 1.745
Nitrous Oxide (N ₂ O)	0.180 to 0.260	0.270	0.319	0.323 / 0.322

Sources:

¹ Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis*, (2007) 3, 100.

² Dr. Pieter Tans, National Oceanic and Atmospheric Administration (NOAA)/Earth System Research Laboratory (ESRL), "Trends in Atmospheric Carbon Dioxide," <http://www.esrl.noaa.gov/gmd/ccgg/trends>. 2011.

³ Carbon Dioxide Information Analysis Center, "Recent Greenhouse Gas Concentrations," http://cdiac.ornl.gov/pns/current_ghg.html. 2011. The first value for CH₄ and N₂O represents Mace Head, Ireland, a mid-latitude Northern-Hemisphere site, and the second value represents Cape Grim, Tasmania, a mid-latitude Southern-Hemisphere site.

²⁵ Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis*, (2007) 3, 100.

Effects of Global Climate Change

The primary effect of global climate change has been a rise in the average global tropospheric temperature of 0.2° Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005.²⁶ Climate change modeling using 2000 emission rates shows that further warming is likely to occur, which would induce further changes in the global climate system during the current century.²⁷ Changes to the global climate system and ecosystems and to California could include

- declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;²⁸
- rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;²⁹
- changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;³⁰
- declining Sierra snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;³¹
- increasing the potential for erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Delta and associated levee systems due to the rise in sea level;³²
- increasing pest infestation making California more susceptible to forest fires;³³
- increasing the demand for electricity by 1 to 3 percent by 2020 due to rising temperatures resulting in hundreds of millions of dollars in extra expenditures;³⁴ and

²⁶ IPCC, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

²⁷ IPCC, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

²⁸ IPCC, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

²⁹ IPCC, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

³⁰ IPCC, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

³¹ California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

³² California EPA, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

³³ California EPA, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

³⁴ California EPA, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

- increasing the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas located in the Southern California area and the San Joaquin Valley by the end of the 21st century.³⁵

In June 2010, CARB released a report, *Climate Change Impact on Air Quality in California*, which studied how climate change will influence air quality in California through changes to meteorology and emissions.³⁶ The report analyzed the effect of temperature and other meteorological changes consistent with future predicted meteorological conditions from Global Climate Models (GCMs) on ozone and particulate matter concentrations with a focus on the South Coast Air Basin and the San Joaquin Valley Air Basin. According to the modeling results, by 2050, temperature and other meteorological changes predicted to occur due to a changing climate could increase the number of days with conditions likely to encourage ozone concentrations greater than 90 parts per billion (equal to the state 1-hour average ozone ambient air quality standard) anywhere from 6 to 30 days per year under various GCM scenarios.³⁷ This climate-change increase is referred to as a climate “penalty.” The modeling results did not indicate a statistically significant climate “penalty” for annual average particulate matter concentrations but future extreme events when stagnation conditions (low wind speeds) are stronger could result in increased concentrations of particulate matter from sources located close to population centers.³⁸ The results of the report indicate that warmer future temperatures would require air quality management districts and air pollution control districts to implement additional emissions control regulations in affected air basins in California to offset the climate “penalty,” particularly for ozone.

In 2009, the California Natural Resources Agency (CNRA) published the *California Climate Adaptation Strategy*³⁹ as a response to the Governor’s Executive Order S-13-2008. The CNRA report lists specific recommendations for state and local agencies to best adapt to the anticipated risks posed by a changing climate. The key preliminary recommendations for adapting to a changing climate are based on sector specific and cross-sector adaptation strategies identified in the CNRA report. The sectors consist of Public Health, Biodiversity and Habitat, Ocean and Coastal Resources, Water Management, Agriculture, Forestry, Transportation and Energy Infrastructure, and Cross-Sector.

³⁵ California EPA, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

³⁶ Kleeman, M. J., Chen, S., and Harley, R.A., *Climate Change Impact on Air Quality in California: Report to the California Air Resources Board*, 2010.

³⁷ *Climate Change Impact on Air Quality in California: Report to the California Air Resources Board*, 2010. 95.

³⁸ *Climate Change Impact on Air Quality in California: Report to the California Air Resources Board*, 2010. 198 and 209.

³⁹ California Natural Resources Agency, Climate Action Team, *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008*, (2009).

PROJECT IMPACTS

Significance Threshold Criteria

In accordance with SB 97, the Natural Resources Agency adopted amendments to Appendix G of the *State CEQA Guidelines* that include criteria for evaluating GHG emissions on December 30, 2009.⁴⁰ The Natural Resources Agency delivered its rulemaking package to the Office of Administrative Law for their review pursuant to the Administrative Procedure Act. The adopted amendments became effective on March 18, 2010. According to the adopted amendments, a project would have a significant effect on the environment if it would:

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

The *State CEQA Guidelines* (Section 15064.7) state that, when available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make determinations of significance. The first Appendix G checklist question may be evaluated by directly calculating GHG emissions from the proposed project. The second Appendix G checklist question may be evaluated by demonstrating compliance with plans, policies, or regulations adopted by local governments to curb GHG emissions. According to the Natural Resources Agency:

*Provided that such plans contain specific requirements with respect to resources that are within the agency's jurisdiction to avoid or substantially lessen the agency's contributions to GHG emissions, both from its own projects and from private projects it has approved or will approve, such plans may be appropriately relied on in a cumulative impacts analysis.*⁴¹

As previously discussed, the SCAQMD has published draft guidance documents that have not yet been formally adopted. The SCAQMD is currently developing thresholds for GHG emissions. As previously discussed, the SCAQMD Working Group has released draft recommendations for screening levels of GHG emissions. According to the draft, all land use projects that do not exceed a screening threshold of 3,000 MTCO₂e or 4.8 MTCO₂e per service population per year would be considered to result in a less than significant impact with respect to GHG emissions. If a project exceeds these screening thresholds, the Working Group's draft documents recommend that projects reduce their emissions via project design features and mitigation measures. Projects may optionally demonstrate GHG reductions from a base case

⁴⁰ The adopted amendments may be viewed at the following website: <http://ceres.ca.gov/ceqa/guidelines/>. 2009.

⁴¹ Natural Resources Agency, *Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97*, (2009) 15.

scenario, which includes any applicable land use sector reductions from AB 32. While the SCAQMD has not adopted these thresholds, it is possible that the SCAQMD will adopt them, or similar thresholds, at some future date. Therefore, while it is recognized that methodologies to evaluate GHG emissions are still under development and could change in the future, this analysis relies on the information contained in the SCAQMD's draft guidance documents, as described above to assess the project's significance with respect to GHG emissions.

The State of California, through its Governor and Legislature, has established a comprehensive framework for the substantial reduction of GHG emissions. This will occur primarily through the implementation of AB 32 and Executive Order S-3-05, which addresses the reduction of GHG emissions on a statewide cumulative basis. Because the lead agency has not yet formally adopted a GHG reduction plan (the City of Santa Clarita is in the process of preparing a Climate Action Plan), the project will also be evaluated with respect to consistency with general statewide strategies to reduce GHG emissions.

Methodology

OPR in its Technical Advisory has recommended that GHG emissions from project-related traffic, energy consumption, water usage, and construction activities, should be identified and estimated, to the extent that data is available to calculate such emissions. In addition, CARB staff has considered extensively the value of indirect emissions in a mandatory reporting program. CARB believes that indirect energy usage provides a more complete picture of the emissions footprint of a facility. According to CARB, "As facilities consider changes that would affect their emissions – addition of a cogeneration unit to boost overall efficiency even as it increases direct emissions, for example – the relative impact on total (direct plus indirect) emissions by the facility should be monitored. Annually reported indirect energy usage also aids the conservation awareness of the facility."⁴² For these reasons, CARB has proposed requiring the calculation of direct and indirect GHG emissions as part of the AB 32 reporting requirements, and this analysis does so.

The California Air Pollution Control Officers Association (CAPCOA) has stated that the information needed to characterize GHG emissions from manufacture, transport, and end-of-life of construction materials (often referred to as lifecycle emissions) would be speculative at the CEQA analysis level.⁴³

⁴² California Air Resources Board, *Initial Statement of Reasons for Rulemaking, Proposed Regulation for Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (Assembly Bill 32)*, (2007).

⁴³ California Air Pollution Control Officers Association, *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, (2008) 65.

Since accurate and reliable data does not exist for estimating lifecycle emissions for the proposed project, the analysis does not assess such lifecycle GHG emissions.

The data sources and tools used to evaluate the GHG impacts associated with construction and operation of the proposed project include the Roadway Construction Emissions Model, Version 6.3.2, which was developed by the SMAQMD.⁴⁴ The Roadway Construction Emissions Model is used to assess the emissions from linear construction projects, such as roadways. The model incorporated factors from CARB's EMFAC2007 on-road vehicle emissions model and CARB's OFFROAD2007 off-road vehicle emissions model. Both EMFAC2007 and OFFROAD2007 contain the most up-to-date emission factors for on-road and off-road vehicles. The Roadway Construction Emissions Model is approved for use by the SCAQMD for estimating air pollutant emissions for environmental analyses pursuant to CEQA.⁴⁵ Electricity GHG emissions related to street lighting and traffic signals were obtained from data from the US Department of Energy and the California Climate Action Registry. Additional sources consulted for this analysis include data and guidance from the US EPA, CARB, the California Energy Commission, the California Climate Action Registry's *General Reporting Protocol*, and other GHG and global climate change data as referenced. Emission calculations conducted for the proposed project are contained in **Appendix 4.5**.

DESIGN MEASURES ALREADY INCORPORATED INTO THE PROJECT

- DM 4.5-1** The proposed project consists of the extension of the Via Princesa roadway to make it one of the primary east-west arterials through the City of Santa Clarita, which would improve traffic flow within the City.
- DM 4.5-2** The proposed project includes a two-lane bike path along the south side of the project.
- DM 4.5-3** The proposed project includes sidewalks for pedestrians on each side of the roadway.

⁴⁴ Sacramento Metropolitan Air Quality Management District, *Roadway Construction Emissions Model Version 6.3.2, 2009*. The model may be downloaded from the following website: <http://www.airquality.org/ceqa/index.shtml>.

⁴⁵ Spoken communication with Daniel Garcia, air quality specialist at SCAQMD. The Sacramento Metropolitan Air Quality Management's Roadway Construction Emissions Model can be used as long as emission factors are current and accurate.

Impact Analysis

Impact Threshold 4.5-1 **The project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.**

Construction Emissions

The proposed project would result in emissions of GHGs during construction. These emissions, primarily CO₂, CH₄, and N₂O, are the result of fuel combustion by construction equipment and motor vehicles. The other primary GHGs (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) are typically associated with specific industrial sources and are not expected to be emitted by the proposed project in appreciable quantities.

Development of the proposed project would involve site clearing, grading/excavation, trenching for drainage and utilities, and asphalt paving. Construction of the project would require cut and fill of debris and soil associated with grading/excavation. During periods of construction activity, on-site stationary sources, heavy-duty construction vehicles, and construction worker vehicles would generate GHG emissions. The proposed project is 25.2 acres in size. Site grading/excavation would require on-site cut and fill activities. The project applicant estimated that the amount of cut and fill would be 762,120 cubic yards. A maximum of 1 acre would be disturbed daily. Grading is expected to begin in September 2013 and last through January 2015.

The one-time emissions of CO₂ from construction equipment were estimated using the SMAQMD's Roadway Construction Emissions Model, Version 6.3.2. The Roadway Construction Emissions Model only provides CO₂ emissions and does not provide estimates of other GHGs associated with combustion, namely CH₄ and N₂O. Therefore, in order to account for emissions of these compounds, the following adjustments were made to the emission calculations:

- **Construction diesel trucks and equipment:** The CO₂ emissions associated with off-road and on-road equipment were multiplied by a factor based on the assumption that CO₂ represents approximately 99 percent of the CO_{2e} emissions. These assumptions were derived from the California Climate Action Registry⁴⁶ and the California Energy Commission.⁴⁷

⁴⁶ California Climate Action Registry, General Reporting Protocol: Reporting Entity-Wide Greenhouse as Emissions Version 3.1, (2009) 96, 98, 100.

⁴⁷ California Energy Commission, *Diesel Use in California*, Remarks by Commissioner James D. Boyd, (2002).

- **Motor vehicles:** The CO₂ emissions associated with project-generated trips were multiplied by a factor based on the assumption that CO₂ represents 95 percent of the CO_{2e} emissions associated with passenger vehicles, which account for most of the project-related trips.⁴⁸

Table 4.5-5, Estimated Construction GHG Emissions, list the estimated GHG emissions associated with construction of the proposed project. The SCAQMD recommends amortizing construction-related GHG emissions over a project's lifetime, defined as a 30-year period, in order to include these emissions as part of the annual total operational emissions. Amortized emissions of the project can also be found in **Table 4.5-5**. Detailed calculations are provided in **Appendix 4.5**.

**Table 4.5-5
Estimated Construction GHG Emissions**

Year	Annual Emissions in MTCO _{2e}
2013	739
2014	1,278
2015	453
2016	89
Construction GHG Emissions Total:	2,559
Amortized Construction GHG Emissions:	85

*Source: Impact Sciences, Inc. Emissions calculations are provided in Appendix 4.5.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.*

The emissions associated with the proposed project likely represent a conservative assessment of the actual GHG emissions that would result from construction of the project. The construction emissions were based on the assumption that equipment would operate continuously throughout an 8-hour workday. In reality, construction equipment tends to operate cyclically for only a portion of the workday.

Operational Emissions

The proposed project would improve traffic conditions within the Santa Clarita Valley. The proposed project would not generate new vehicle trips with the exception of periodic trips for the purpose of roadway maintenance and street cleaning. Emissions would be generated from electricity usage for street lighting and traffic signals. However, GHG emissions from these sources would not be expected to emit substantial amounts of GHGs.

⁴⁸ US Environmental Protection Agency, Office of Transportation and Air Quality, *Greenhouse Gas Emissions from a Typical Passenger Vehicle (EPA420-F-05-004)*, (2005) 4.

A GHG emissions analysis was conducted to confirm that the proposed project would not emit substantial operational GHG emissions. The GHG emissions from periodic maintenance and street cleaning vehicles and electricity from street lighting and traffic signals is provided in **Table 4.5-6, Estimated Operational GHG Emissions**. It was assumed that operation of the project would require a total of four street sweeper and maintenance trucks per week (8 trips per week). It was also assumed that a street light would be located on both sides of the Via Princess extension approximately every 130 feet, which is generally consistent with the placement of streetlights on the exiting portion of Via Princessa, based on a review of aerial photographs of the region. In addition, a new traffic signal is warranted with the project at the intersection of Rainbow Glen and Via Princessa, according to the traffic analysis from Austin-Foust Associates, Inc.⁴⁹

**Table 4.5-6
Estimated Operational GHG Emissions**

Source	GHG Emissions (Metric Tons CO ₂ e/year)
Amortized Construction	85
Maintenance Trucks	8
Street Lighting/Traffic Signal Electricity	39
Total GHG Emissions	132

*Source: Impact Sciences, Inc. Emission calculations are provided in Appendix 4.5.
Note: Totals in table may not appear to add exactly due to rounding.*

As shown in **Table 4.5-6**, the proposed project would result in annual operational GHG emissions, including the amortized construction GHG emissions that would be substantially less than the SCAQMD Working Group's draft recommended screening level of 3,000 MTCO₂e. Therefore, the proposed project would have a less than significant impact with respect to GHG emissions.

Mitigation Measures

No mitigation measures are required.

Residual Impacts

No impacts.

⁴⁹ Austin-Foust Associates, Inc., *Via Princessa Extension Traffic Analysis*, (2011).

Impact Threshold 4.5-2 **The project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.**

Proposed Project

The goal of AB 32 is to reduce statewide GHG emissions to 1990 levels by 2020. In December 2008, CARB adopted the *Climate Change Scoping Plan*, which details strategies to meet that goal. The Scoping Plan instructs local governments to establish sustainable community strategies to reduce GHG emissions associated with transportation, energy, and natural resources. Planning efforts that lead to reduced vehicle trips while preserving personal mobility should be undertaken in addition to programs such as employee transit incentives, telework programs, car sharing, parking policies, public education programs and other strategies that enhance and complement land use and transit strategies. The *Climate Change Scoping Plan* also recommends energy-efficiency measures such as maximizing the use of energy-efficient lighting.

As discussed earlier, SB 375 required CARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. It is not known whether the proposed project is consistent with the sustainable communities strategy because SCAG has not finalized the strategy. Nonetheless, the proposed project incorporates a variety of components, including provisions for bicycle lanes and pedestrian paths. These components will result in reduced use of gas-powered automobiles with associated reductions in GHG emissions. Therefore, the project does contain measures that should assist in meeting the region's obligations under SB 375. The project would also extend the Via Princessa roadway to make it one of the primary east-west arterials through the City of Santa Clarita, which would improve traffic flow within the City and allow for travel that is more efficient. In order to ensure a pedestrian-friendly atmosphere that would encourage non-motorized travel, it is recommended that the Proposed project require that all trees removed during construction be replaced.

As noted above, The *Climate Change Scoping Plan* recommends energy-efficiency measures such as maximizing the use of energy-efficient lighting. The use of energy-efficiency measures are also recommended by various other agencies including OPR, the California Action Team, and the California Attorney General's Office. The California Office of the Attorney General has stated lead agencies can play an important role in "moving the state away from 'business as usual' and toward a low-carbon future."⁵⁰ While the proposed project would result in GHG emissions that are well under the SCAQMD Working

⁵⁰ California Office of the Attorney General, *The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level*, (2008)

Group's draft screening level, the project could further reduce its emissions by incorporating energy-efficiency lighting, such as light-emitting diodes (LEDs), for street lighting and traffic signals. According to the US Department of Energy, traffic signals using LED lights consume about 10 percent of the power consumed by traditional incandescent lamps, resulting in an energy savings of 90 percent.⁵¹ Streetlights using LED lights consume about 66 percent of the power consumed by high-pressure sulfur lights, resulting in an energy savings of 44 percent.⁵² Thus, in order to comply with the general energy-efficiency strategies recommended by the State of California, it is recommended that the project include the use of energy-efficient lighting, such as LEDs, as mitigation measures.

With respect to construction-related GHG emissions and impacts, the State of California recommends that projects limit unnecessary idling of diesel trucks and divert (e.g., recycle) construction debris to the maximum extent. These measures are supported by CARB, OPR, the Climate Action Team, and the Office of the Attorney General. Thus, in order to comply with the general construction-related strategies recommended by the State of California, it is recommended that the project include mitigation measures requiring diversion of construction debris and prohibiting unnecessary idling of diesel trucks.

Mitigation Measures

- MM 4.5-1** The proposed project shall use energy-efficient lighting, such as light-emitting diodes, on all streetlights and traffic signals.
- MM 4.5-2** The proposed project shall replace trees removed during construction. Replacement trees shall be native and drought-tolerant.
- MM 4.5-3** The proposed project shall prohibit idling of diesel-fueled vehicles during construction in accordance with CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.
- MM 4.5-4** The proposed project shall divert construction debris to the maximum extent.

Residual Impacts

No impacts.

⁵¹ US Department of Energy, *State Energy Program: Case Studies*, n.d. Report can be downloaded from the following website: <http://www.nrel.gov/docs/fy04osti/35551.pdf>.

⁵² US Department of Energy, "Solid-State Lighting GATEWAY Demonstration Results," http://www1.eere.energy.gov/buildings/ssl/gatewaydemos_results.html. 2011. Refer to the case study: LED Roadway Lighting; Palo Alto, California.

CUMULATIVE IMPACTS

Global climate change is by definition a cumulative impact, as GHG emissions do not have a localized impact; they impact the globe as a whole. As such, the analysis of the proposed project's impacts on GHG emissions and climate change is by definition a cumulative analysis. As indicated above, the proposed project would not exceed the SCAQMD Working Group's draft recommended screening level. The project is also consistent with the applicable GHG reduction measures under AB 32, and recommended by CARB, OPR, the Climate Action Team, and the Office of the Attorney General, with the incorporation of **Mitigation Measures MM 4.5-1** through **MM 4.5-4**, as listed above. As the impact from the project's GHG emissions are essentially a cumulative impact, the analysis presented in the section provides an adequate analysis of the proposed project's cumulative impact related to GHG emissions. No separate analysis is required.

UNAVOIDABLE SIGNIFICANT IMPACTS

No unavoidable significant GHG emissions and climate change impacts would result from implementation of the proposed project.