



**Greenhouse Gas Analysis Report Diamond
Oaks Vesting Subdivision Map City of Visalia,
Tulare County, California**

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July 19, 2013

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ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AB	Assembly Bill
ARB	California Air Resources Board
BPS	Best Performance Standards
CalEEMod	California Emissions Estimator Model
CAP	Draft Preliminary Climate Action Plan
CEQA	California Environmental Quality Act
CH ₄	methane
CO ₂	carbon dioxide
EPA	Environmental Protection Agency
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
ITE	Institute of Traffic Engineers
MTCO ₂ e	metric tons of carbon dioxide equivalent
MMTCO ₂ e	million metric tons of carbon dioxide equivalent
N ₂ O	nitrous oxide
ppm	parts per million
ppt	parts per trillion
SB	Senate Bill
sf	square foot, square feet
SJVAPCD	San Joaquin Valley Air Pollution Control District

SECTION 1: EXECUTIVE SUMMARY

1.1 - Purpose and Methods of Analysis

The following air quality analysis was prepared to evaluate whether the expected criteria air pollutant emissions generated from the project would cause significant impacts to air resources in the project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA), California Public Resources Code Sections 21000, et seq.). The methodology follows the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) Guidance for Valley Land-Use Agencies in Addressing Greenhouse Gas Emission Impacts for New Projects under CEQA (SJVAPCD 2009).

1.2 - Findings

- The project would generate greenhouse gas emissions, either directly or indirectly, but would not have a significant impact on the environment.
- The project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Impact Findings

Impact GHG-1: The project would generate direct and indirect greenhouse gas emissions, but those emissions would not result in a less than significant impact on the environment.
Less than significant impact.

Impact GHG-2: The project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases. **Less than significant impact.**

1.3 - Project Description

1.3.1 - Project Location

The project is located south of Caldwell Avenue (Avenue 280) between Burke Street on the west and Ben Maddox Way on the east, in the City of Visalia, Tulare County California. Exhibit 1 shows the regional location of the project. The project is located in the San Joaquin Valley Air Basin.

1.3.2 - Existing Conditions

Exhibit 2 shows an aerial view of the project site's local vicinity. As shown in Exhibit 2, the project site consists of vacant, disturbed land.

1.3.3 - Proposed Project

As shown in Exhibit 3, the proposed project consists of the development of single- and multi-family residential dwelling units. The gross site size is 55.9 acres. The project includes 168 single-family dwelling units on 24.52 acres, 8 triplex lots (24 dwelling units) on 3.08 acres, 4 multi-family lots (42 dwelling units per lot) on 11.14 acres, and 6 outlots totaling 1.62 acres. Total proposed dwelling units are 360. The Assessors Parcel Number is 126-100-12.

The area surrounding the project site is a mixture of commercial, residential, and agricultural land uses.

1.3.4 - Project Design Features

The project has incorporated the following design features that reduce emissions.

Landscaping

The project would have onsite landscaping. There are mature Valley oak trees along the western boundary that will be retained and new street trees that will be planted in the subdivision. The shade provided would reduce the heat island effect, thereby potentially reducing the cooling requirements for the buildings. The onsite landscaping helps to counterbalance the project's contribution of greenhouse gases (GHGs) by providing onsite carbon storage. The trees and shrubs take in carbon dioxide and store it.

Project Location

The project is located within 1.5 miles of existing local-serving retail at Visalia Parkway and S. Mooney Boulevard. The project is located within 2.5 miles of downtown Visalia. The proximity to commercial land uses reduces vehicle miles traveled and corresponding criteria pollutants and GHG emissions.

Bicycle and Pedestrian Features

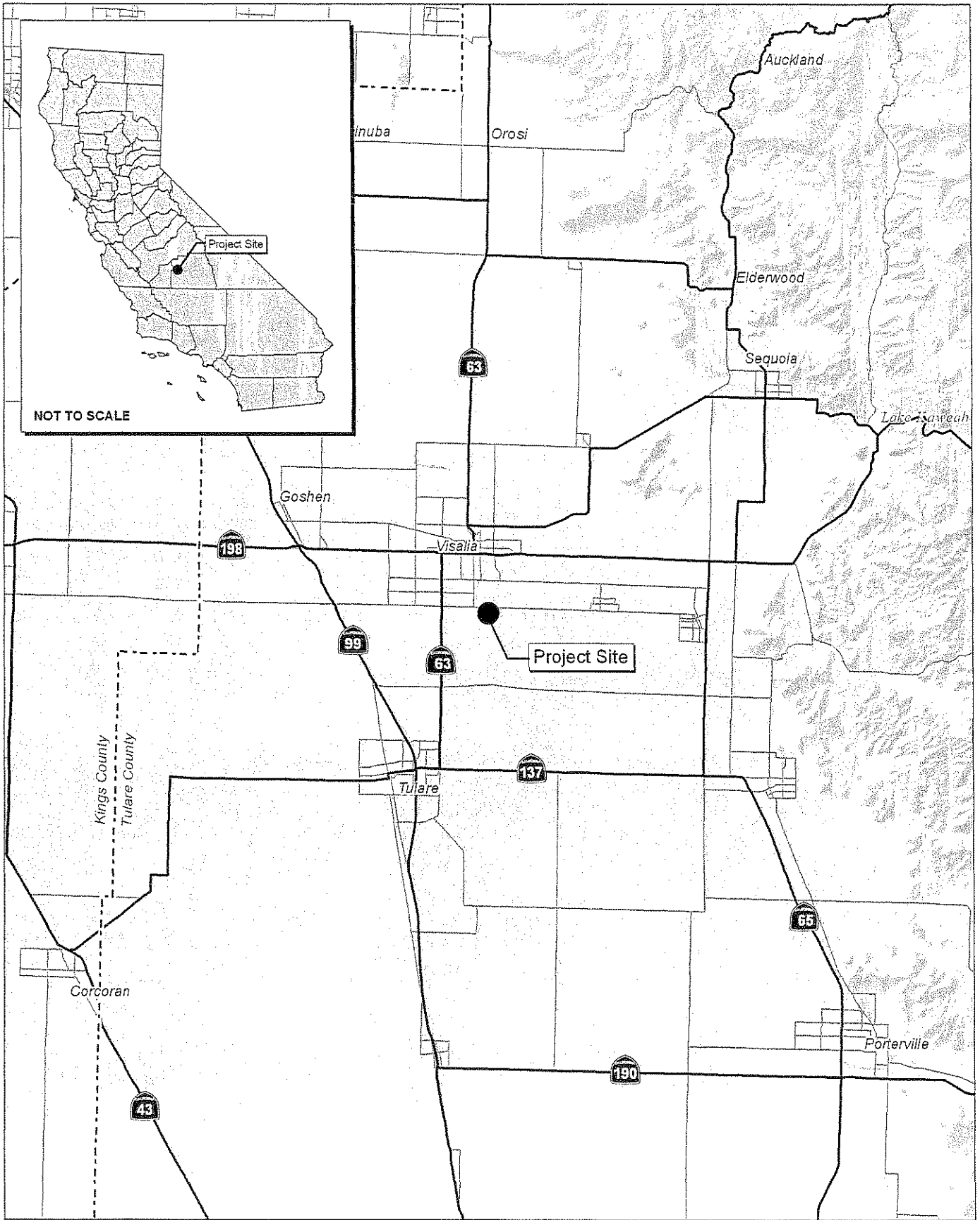
The project will provide pedestrian-friendly measures such as sidewalks and pedestrian access for residences in the subdivision. The project is located adjacent to planned Class II (Visalia Parkway) and Class III (Caldwell Avenue). These features would provide alternate forms of transportation to the residences, and they reduce criteria pollutants and GHG emissions from motor vehicles.

Transit

Bus service in the project area is provided by Visalia Transit, whose Route 2 runs adjacent to the project site with a transit stop adjacent to the northern boundary of the site. The proximity of transit to the project site would provide alternate forms of transportation to the residences, and it reduces emissions of criteria pollutants and GHGs from motor vehicles.

Recycling

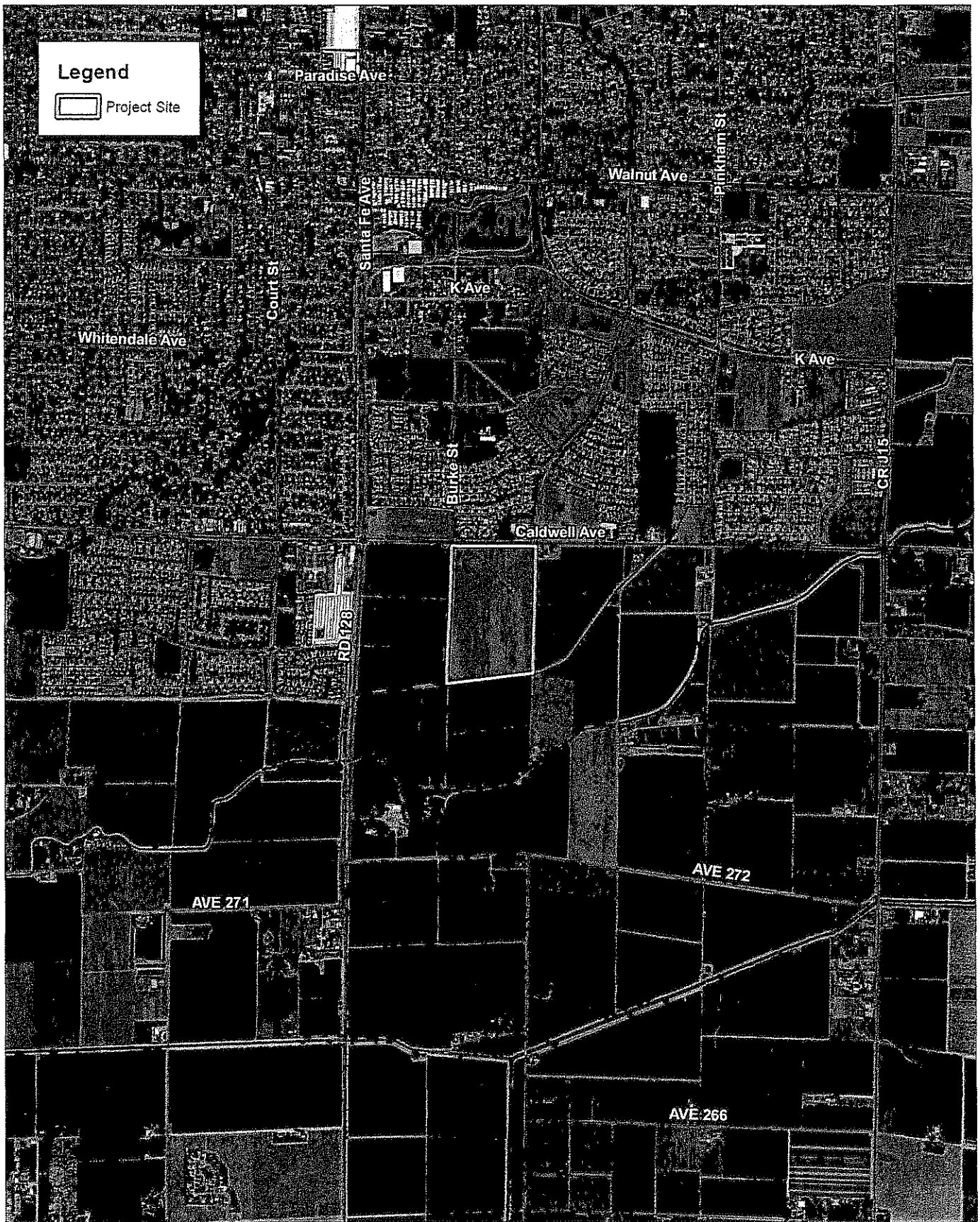
The project is located in the City of Visalia, which provides residences with recycling services. The reduction in waste leads to fewer GHG emissions generated at landfills.




Source: Census 2000 Data, The CaSIL, FCS-MBA GIS 2013.



Exhibit 1 Regional Location Map



Legend

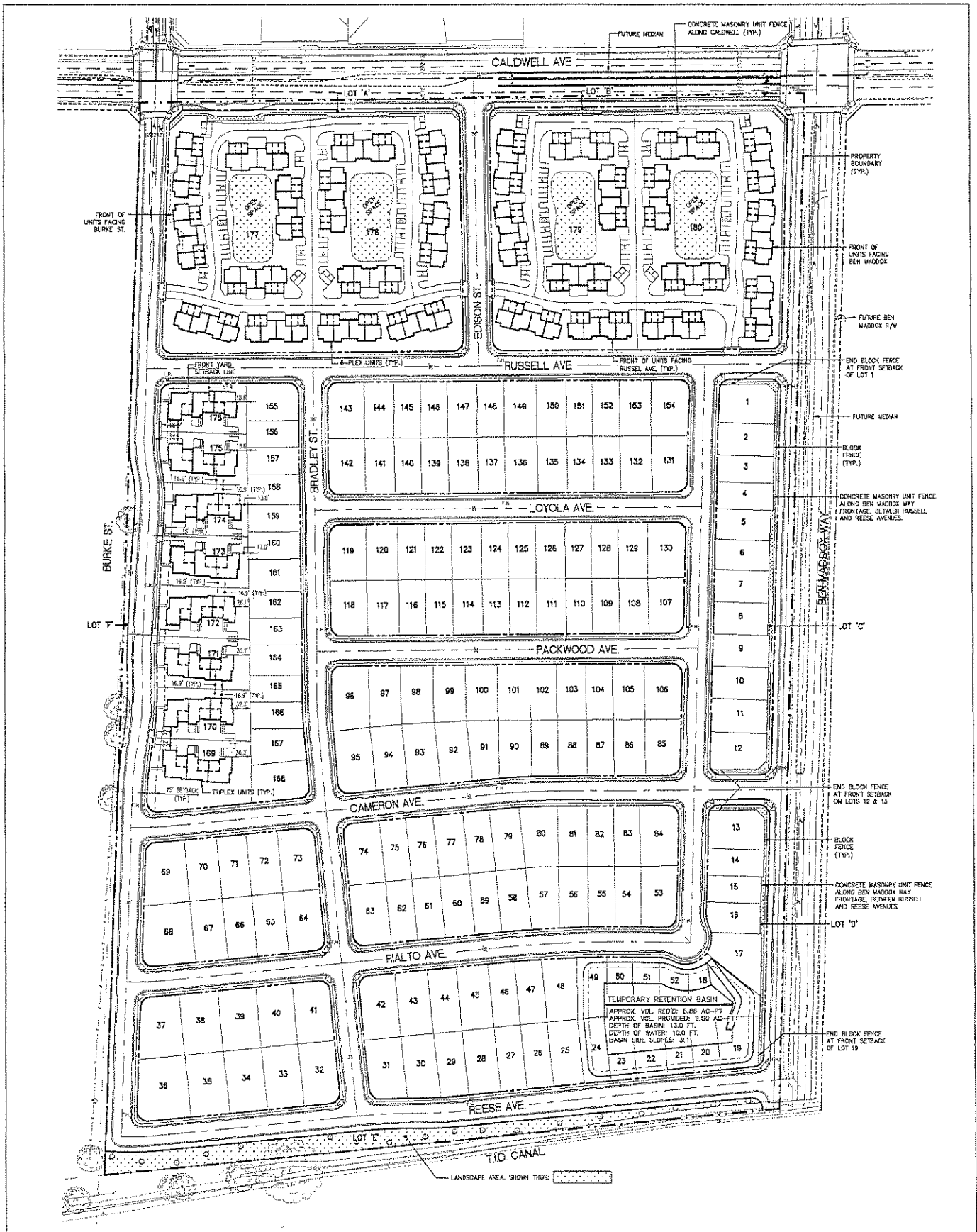
 Project Site

Source: ESRI Aerial Imagery.

Exhibit 2
Local Vicinity Map
Aerial Base



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Source: Lane Engineers Inc., August 2012.



Exhibit 3 Site Plan

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Renewable Energy Sources

The proposed project will offer homeowners the opportunity to install rooftop solar photovoltaic facilities on their homes, which would provide a source of renewable energy and a corresponding decrease in GHG emissions.

1.4 - Standard Conditions

During construction and operation, the project must comply with applicable rules and regulations. The following are rules and regulations that the project may be required to comply with, either directly or indirectly.

State

Green Building Standards

During operation, the project is required to comply with Title 24 of the California Code of Regulations established by the Energy Commission regarding energy conservation standards. The project is also required to comply with the California Green Building Standards.

Title 24. California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted 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 efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after January 1, 2011 must follow the 2008 standards. The upcoming standards are anticipated in 2013. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

California Green Building Standards. On January 12, 2010, the State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011. The Code is a comprehensive and uniform regulatory code for all residential, commercial and school buildings.

The California Green Building Standards Code does not prevent a local jurisdiction from adopting a more stringent code as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they provide a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard that buildings need to meet in order to be certified for occupancy. Enforcement is generally through the local building official.

The California Green Building Standards Code (code section in parentheses) requires:

- Water Efficiency and Conservation [Indoor Water Use (4.303.1)]. Fixtures and fixture fittings reducing the overall use of potable water within the building by at least 20 percent shall be provided. The 20 percent reduction shall be demonstrated by one of the following methods:

1. Prescriptive Method: Showerheads (≤ 2.0 gpm @ 80 psi); Residential Lavatory Faucets (≤ 1.5 gpm @ 60 psi); Nonresidential Lavatory Faucets (≤ 0.4 gpm @ 60 psi); Kitchen Faucets (≤ 1.8 gpm @ 60 psi); Toilets (≤ 1.28 gal/flush); and urinals (≤ 0.5 gal/flush).
 2. Performance Method: Provide a calculation demonstrating a 20% reduction of indoor potable water using the baseline values set forth in Table 4.303.1. The calculation will be limited to the total water usage of showerheads, lavatory faucets, water closets and urinals within the dwelling.
- Water Efficiency and Conservation [Outdoor Water Use (4.304.1)]. Irrigation Controllers. Automatic irrigation system controllers for landscaping provided by the builder and installed at the time of final inspection shall comply with the following:
 - Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' watering needs as weather or soil conditions change.
 - Weather-based controllers without integral rain sensors or communication systems that account for rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s).
 - Construction Waste Reduction of at least 50 percent (4.408.1). Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4; OR meet a more stringent local construction and demolition waste management ordinance. Documentation is required per Section 4.408.5. Exceptions:
 1. Excavated soil and land-clearing debris.
 2. Alternate waste reduction methods developed by working with local enforcing agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite.
 3. The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.
 - Environmental Quality [Fireplaces (4.503.1)]. Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with all applicable local ordinances.
 - Materials pollution control (4.504.1–4.504.6). Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring and particleboard.
 - Installer and Special Inspector Qualifications (702.1-702.2). Mandatory special installer inspector qualifications for installation and inspection of energy systems (e.g., heat furnace, air conditioner, mechanical equipment).

Local

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District's Rule 4901 Wood Burning Fireplaces and Wood Burning Heaters places the following limitations on wood burning fireplaces or wood burning heaters in new residential developments:

- No person shall install a wood burning fireplace in a new residential development with a density greater than two dwelling units per acre.
- No person shall install more than two EPA Phase II Certified wood burning heaters per acre in any new residential development with a density equal to or greater than three dwelling units per acre.
- No person shall install more than one wood burning fireplace or wood burning heater per dwelling unit in any new residential development with a density equal to or less than two (2) dwelling units per acre.

City of Visalia

City of Visalia Standards. The City of Visalia imposes the following measures for all residential development projects:

Pedestrian Connections. The following measures shall be implemented to encourage bicycle and pedestrian access and reduce motor vehicle emissions:

- Site plans submitted to the City of Visalia shall include sidewalks appropriately sized for anticipated future pedestrian use on all adjacent and interior roadways.
- Physical barriers such as walls, berms, landscaping and slopes between the project and pedestrian or bicycle access shall be avoided at locations that interfere with access to primary pedestrian and bicycle routes serving the project.

Landscape Plan. Prior to issuance of building permits, a landscape plan shall be prepared and submitted to the City of Visalia for review and approval pursuant to the City's normal planning process that provide shade trees and foliage to reduce building and surface lot heating/cooling needs, and conform to landscape standards established by the City of Visalia. The landscape plan shall be designed to comply with the Model Water Efficient Landscape Ordinance and California Green Building Measures.

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SECTION 2: CLIMATE CHANGE SETTING

2.1 - Climate Change

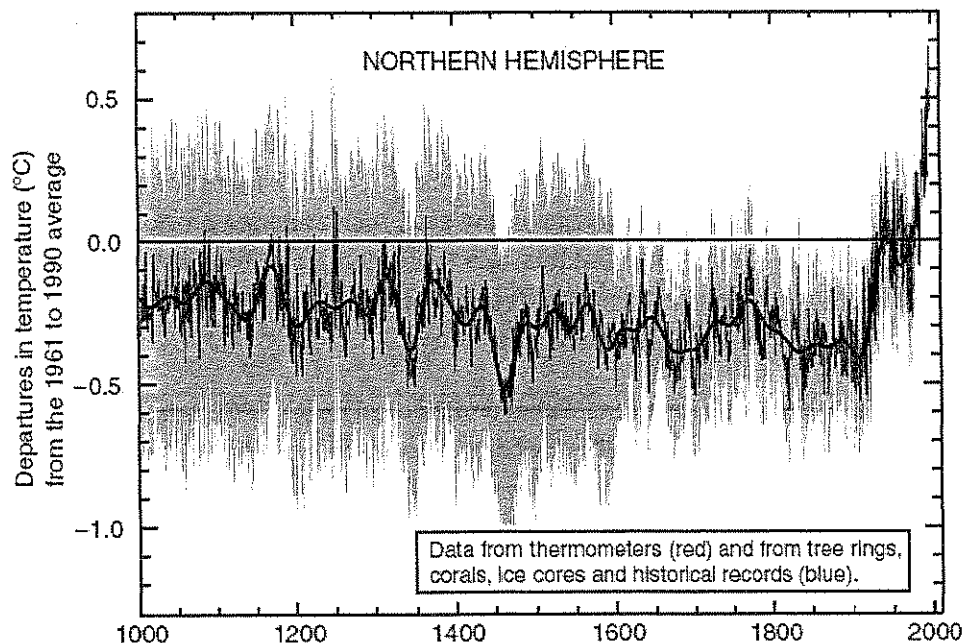
Climate change is a change in the average weather of the earth that is measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Fourth Assessment Report, the IPCC predicted that the global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios (Intergovernmental Panel on Climate Change 2007a). The report also concluded that “[w]arming of the climate system is unequivocal,” and that “[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.”

Some have questioned the validity of the IPCC’s report by claiming that the peer review process could have been inadequate. A recent audit concluded that 48 percent of the chapters in the Fourth Assessment Report received a grade of “F” meaning that 59 percent or fewer of the sources were peer reviewed (NoConsensus.org 2010).

Some question the validity of the temperature graph used by the IPCC in some form in the Third and Fourth Assessment Reports. The graph is shown in Figure 1. The figure shows that temperatures are relatively stable until 1900, when the temperature increases rapidly. Some scientists have had trouble duplicating the data used for the graph (McIntyre and McKittrick 2003) and indicated when the data is correctly handled “shows the 20th century climate to be unexceptional compared to earlier centuries” (McKittrick 2005). Hans von Storch, a German climate scientist, claimed that the methods used by Mann et al. probably underestimated the temperature fluctuations in the past by a factor of two or more (Von Storch et al. 2004).

Figure 1: Historical Temperature Changes



(Source: Intergovernmental Panel on Climate Change, 2001.)

2.1.1 - Consequences of Climate Change in California

In California, climate change may result in consequences such as the following (from California Climate Change Center 2006 and Moser et al. 2009).

- **A reduction in the quality and supply of water from the Sierra snowpack.** If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. This can lead to challenges in securing adequate water supplies. It can also lead to a potential reduction in hydropower.
- **Increased risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- **Reductions in the quality and quantity of certain agricultural products.** The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- **Exacerbation of air quality problems.** If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.

- **A rise in sea levels resulting in the displacement of coastal businesses and residences.** During the past century, sea levels along California’s coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.
- **An increase temperature and extreme weather events.** Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.
- **A decrease in the health and productivity of California’s forests.** Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

2.2 - Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as GHGs. The effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit GHGs. The presence of GHGs in the atmosphere affects the earth’s temperature. It is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Climate change is driven by forcings and feedbacks. Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. Positive forcing tends to warm the surface while negative forcing tends to cool it. Radiative forcing values are typically expressed in watts per square meter. A feedback is a climate process that can strengthen or weaken a forcing. For example, when ice or snow melts, it reveals darker land underneath which absorbs more radiation and causes more warming. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. The global warming potential of a gas is essentially a measurement of the radiative forcing of a GHG compared with the reference gas, carbon dioxide.

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential of one. The global warming potential of a GHG is a measure of how much a given mass of a GHG is estimated to contribute to global warming. To describe how much global warming a given type and amount of GHG may cause, the carbon dioxide equivalent is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent reference gas, carbon dioxide. For example, methane’s warming potential of 21 indicates that methane has 21 times greater warming affect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual GHG multiplied by its global warming potential. Greenhouse gases defined by Assembly

Bill (AB) 32 (see the Climate Change Regulatory Environment section for a description) include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. They are described in Table 1.

Table 1: Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (laughing gas) is a colorless greenhouse gas. It has a lifetime of 114 years. Its global warming potential is 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 21.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide	Carbon dioxide (CO ₂) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987.
Hydrofluorocarbons	Hydrofluorocarbons are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.

Table 1 (cont.): Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Sulfur hexafluoride	Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Sources: Compiled from a variety of sources, primarily Intergovernmental Panel on Climate Change 2007a and Intergovernmental Panel on Climate Change 2007b.		

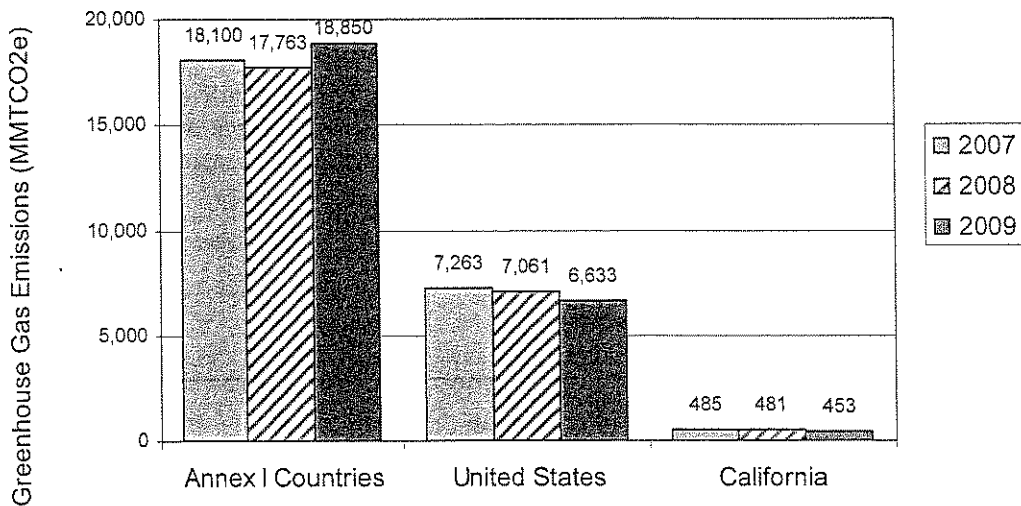
Other GHGs include water vapor, ozone, and aerosols. Water vapor is an important component of our climate system and is not regulated. Ozone and aerosols are short-lived GHGs; global warming potentials for short-lived GHGs are not defined by the IPCC. Aerosols can remain suspended in the atmosphere for about a week and can warm the atmosphere by absorbing heat and cool the atmosphere by reflecting light. Black carbon is a type of aerosol that can also cause warming from deposition on snow.

Although there could be health effects resulting from changes in the climate and the consequences that can bring about, inhalation of GHGs at levels currently in the atmosphere would not result in adverse health effects, with the exception of ozone and aerosols (particulate matter). The potential health effects of ozone and particulate matter are discussed in criteria pollutant analyses. At very high indoor concentrations (not at levels existing outside), carbon dioxide, methane, sulfur hexafluoride, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen (Centers for Disease Control and Prevention 2010, Occupational Safety and Health Administration 2003).

2.2.1 - Emissions Inventories

Emissions worldwide were approximately 49,000 million metric tons of carbon dioxide equivalents (MMTCO₂e) in 2004 (Intergovernmental Panel on Climate Change 2007b). Greenhouse gas emissions in 2007, 2008, and 2009 are shown in Figure 2. Annex I parties refer to countries that joined the United Nations Framework Convention on Climate Change.

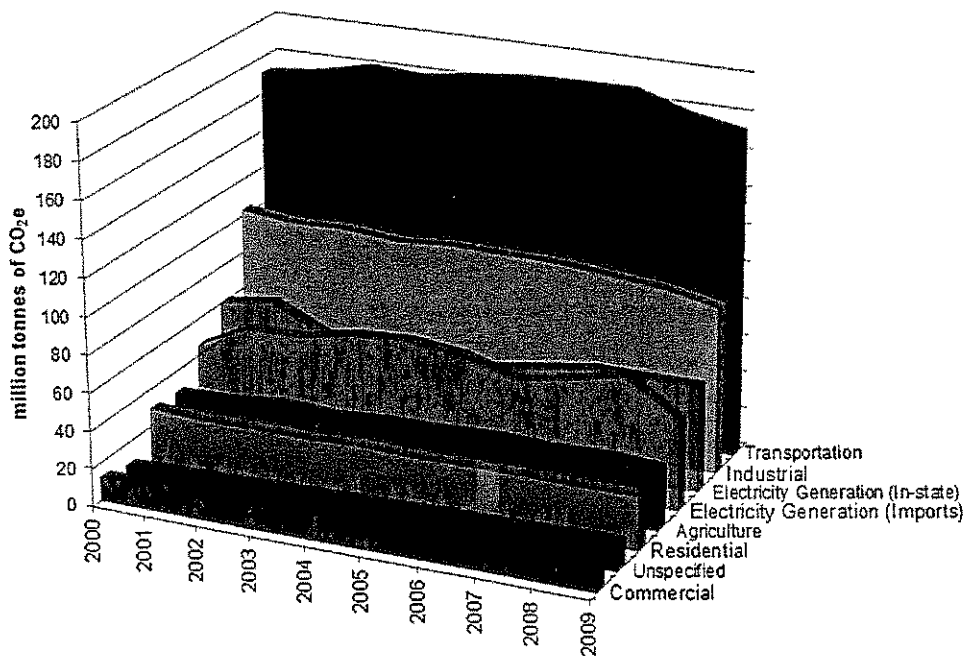
Figure 2: Greenhouse Gas Emissions Trends



Prepared by Michael Brandman Associates using the following data sources:
California Air Resources Board 2011
U.S. Environmental Protection Agency 2011
United Nations Framework Convention on Climate Change 2010

As shown in Figure 3, the main contribution of GHG emissions in California between the years 2000 through 2009 was transportation (ARB 2011). The second highest sector was industrial, which includes sources from refineries, general fuel use, oil and gas extraction, cement plants, and cogeneration heat output.

Figure 3: Greenhouse Gas Emission Trends by Sector in California



2.3 - Regulatory Environment

2.3.1 - International

Climate change is a global issue; therefore, many countries around the world have made an effort to reduce GHGs.

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations. On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

Kyoto Protocol. A particularly notable result of the United Nations Framework Convention on Climate Change efforts is a treaty known as the Kyoto Protocol, which went into effect on February 16, 2005. When countries sign the Kyoto Protocol, they demonstrate their commitment to reduce their emissions of GHGs or engage in emissions trading. More than 170 countries are currently participating in the Kyoto Protocol. Industrialized countries are required to reduce their GHG emissions by an average of 5 percent below their 1990 levels by 2012. In 1998, United States Vice President Al Gore symbolically signed the Protocol; however, in order for the Kyoto Protocol to be formally ratified, the United States Congress must approve it. Congress did not do this during the Clinton Administration. Former President George W. Bush did not submit the Protocol to Senate to be ratified based on the exemption granted to China. President Barack Obama has not taken action regarding the Kyoto Protocol because it is about to end.

2.3.2 - National

Greenhouse Gas Endangerment. *Massachusetts v. EPA* (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that the EPA regulate four GHGs, including carbon dioxide, under Section 202(a)(1) of the Clean Air Act. A decision was made on April 2, 2007, in which the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the 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 greenhouse gases—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, which threatens public health and welfare.

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation’s National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards would cut carbon dioxide emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the National Highway Safety Administration are working on a second-phase joint rulemaking to establish national standards for light-duty vehicles for model years 2017 and beyond.

On October 25, 2010, the EPA and the U.S. Department of Transportation proposed the first national standards to reduce GHG emissions and improve fuel efficiency of *heavy-duty trucks and buses*. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20-percent reduction in carbon dioxide emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles and 15-percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the agencies are proposing engine and vehicle standards starting in the 2014 model year, which would achieve up to a 10-percent reduction in fuel consumption and carbon dioxide emissions by 2018 model year.

Mandatory Reporting of Greenhouse Gases. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010 that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule “tailors” the requirements of these Clean Air Act permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the federal code of regulations, EPA states:

This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to greenhouse gas sources, starting with the largest greenhouse gas emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for greenhouse gas emissions until at least April 30, 2016.

EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation’s largest GHG emitters—power plants, refineries, and cement production facilities.

2.3.3 - California

Title 24. Although not originally intended to reduce GHGs, California Code of Regulations Title 24 Part 6: California’s Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted 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 efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after January 1, 2011 must follow the 2008 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

California Green Building Standards. On January 12, 2010, the State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011. The Code is a comprehensive and uniform regulatory code for all residential, commercial and school buildings.

The California Green Building Standards Code does not prevent a local jurisdiction from adopting a more stringent code as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they provide a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling

infrastructure. State building code provides the minimum standard, which buildings need to meet in order to be certified for occupancy. Enforcement is generally through the local building official.

The California Green Building Standards Code (code section in parentheses) requires:

- **Construction waste.** A minimum 50-percent diversion of construction and demolition waste from landfills, increasing voluntarily to 65 and 75 percent for new homes and 80-percent for commercial projects. All (100 percent) of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled.
- **Wastewater reduction.** Each building shall reduce the generation of wastewater by one of the following methods:
 1. The installation of water-conserving fixtures or
 2. Using non-potable water systems (5.303.4).
- **Water use savings.** 20-percent mandatory reduction in indoor water use with voluntary goal standards for 30, 35, and 40-percent reductions.
- **Irrigation efficiency.** Moisture-sensing irrigation systems for larger landscaped areas.
- **Materials pollution control.** Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particleboard.
- **Building commissioning.** Mandatory inspections of energy systems (i.e. heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies.

Pavley Regulations. California AB 1493, enacted on July 22, 2002, required the California Air Resources Board (ARB) to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. The regulation was stalled by automaker lawsuits and by the EPA's denial of an implementation waiver. On January 21, 2009, the ARB requested that the EPA reconsider its previous waiver denial. On January 26, 2009, President Obama directed that the EPA assess whether the denial of the waiver was appropriate. On June 30, 2009, the EPA granted the waiver request.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near term (2009–2012) standards will result in about a 22-percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30-percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

Executive Order S-3-05. Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels.
- By 2020, reduce greenhouse gas emissions to 1990 levels.
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive, but achievable, mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

Low Carbon Fuel Standard – Executive Order S-01-07. The Governor signed Executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020. In particular, the executive order established a Low Carbon Fuel Standard and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the “life-cycle carbon intensity” of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007) and was submitted to ARB for consideration as an “early action” item under AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009. The Low Carbon Fuel Standard was challenged in the United States District Court in Fresno in 2011. The court’s ruling issued on December 29, 2011 included a preliminary injunction against ARB’s implementation of the rule. The Ninth Circuit Court of Appeals stayed the injunction on April 23, 2012 pending final ruling on appeal, allowing the ARB to continue to implement and enforce the regulation.

SB 1368. In 2006, the State Legislature adopted Senate Bill (SB) 1368, which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law will effectively prevent California’s utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. Thus, SB 1368 will lead to dramatically lower GHG emissions associated with California’s energy demand, as SB 1368 will effectively prohibit California utilities from purchasing power from out-of-state producers that cannot satisfy the performance standard for GHG emissions required by SB 1368. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states “(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On

or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a).” Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA.

On April 13, 2009, the Office of Planning and Research submitted to the Secretary for Natural Resources its recommended amendments to the CEQA Guidelines for addressing GHG emissions. On July 3, 2009, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. Following a 55-day public comment period and two public hearings, the Natural Resources Agency proposed revisions to the text of the proposed Guidelines amendments. The Natural Resources Agency transmitted the adopted amendments and the entire rulemaking file to the Office of Administrative Law on December 31, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

The CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

A new section, CEQA Guidelines Section 15064.4, was added to assist agencies in determining the significance of GHG emissions. The new section allows agencies the discretion to determine whether a quantitative or qualitative analysis is best for a particular project. However, little guidance is offered on the crucial next step in this assessment process—how to determine whether the project’s estimated GHG emissions are significant or cumulatively considerable.

Also amended were CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts respectively. Greenhouse gas mitigation measures are referenced in general terms, but no specific measures are championed. The revision to the cumulative impact discussion requirement (Section 15130) simply directs agencies to analyze GHG emissions in an EIR when a project’s incremental contribution of emissions may be cumulatively considerable; however, it does not answer the question of when emissions are cumulatively considerable.

Section 15183.5 permits programmatic GHG analysis and later project-specific tiering, as well as the preparation of Greenhouse Gas Reduction Plans. Compliance with such plans can support a determination that a project’s cumulative effect is not cumulatively considerable, according to proposed Section 15183.5(b).

In addition, the amendments revised Appendix F of the CEQA Guidelines, which focuses on Energy Conservation. The sample environmental checklist in Appendix G was amended to include GHG questions.

AB 32. The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. “Greenhouse gases” as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. ARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states 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.

The ARB Board approved the 1990 GHG emissions level of 427 MMTCO₂e on December 6, 2007 (California Air Resources Board 2007). Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 MMTCO₂e. Emissions in 2020 in a “business as usual” scenario are estimated to be 596 MMTCO₂e.

Under AB 32, the ARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. Discrete early action measures are currently underway or are enforceable by January 1, 2010. The ARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of these early action measures, nine are considered discrete early action measures, as they are regulatory and enforceable by January 1, 2010. The ARB estimates that the 44 recommendations are expected to result in reductions of at least 42 MMTCO₂e by 2020, representing approximately 25 percent of the 2020 target.

The ARB’s Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State’s emissions to 1990 levels by the year 2020 (California Air Resources Board 2008a). The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables 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; and
- 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.

In addition, the Scoping Plan differentiates between “capped” and “uncapped” strategies. “Capped” strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the cap-and-trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. “Uncapped” strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional GHG emission reductions.¹

SB 375. Passing the Senate on August 30, 2008, SB 375 was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, “Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32.” SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies. The Southern California Association of Governments has adopted emissions reductions for per capita light duty vehicles from 2005 levels of 7 percent by 2020 and 13 percent by 2035.

Concerning CEQA, SB 375, section 21159.28 states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the greenhouse gas emission reduction targets.

¹ On March 17, 2011, the San Francisco Superior Court issued a final decision in *Association of Irrigated Residents v. California Air Resources Board* (Case No. CPF-09-509562). While the Court upheld the validity of the ARB Scoping Plan for the implementation of AB 32, the Court enjoined ARB from further rulemaking under AB 32 until ARB amends its CEQA environmental review of the Scoping Plan to address the flaws identified by the Court. On May 23, 2011, ARB filed an appeal. On June 24, 2011, the Court of Appeal granted ARB’s petition staying the trial court’s order pending consideration of the appeal. In the interest of informed decision-making, on June 13, 2011, ARB released the expanded alternatives analysis in a draft Supplement to the AB 32 Scoping Plan Functional Equivalent Document. The ARB Board approved the Scoping Plan and the CEQA document on August 24, 2011.

2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

Executive Order S-13-08. Executive Order S-13-08 indicates that “climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California’s economy, to the health and welfare of its population and to its natural resources.” Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2009) was adopted, which is the “. . . first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States.” Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Renewable Electricity Standards. On September 12, 2002, Governor Gray Davis signed SB 1078 requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 1078 changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Governor Schwarzenegger also directed the ARB (Executive Order S-21-09) to adopt a regulation by July 31, 2010, requiring the state’s load serving entities to meet a 33-percent renewable energy target by 2020. The ARB Board approved the Renewable Electricity Standard on September 23, 2010 by Resolution 10-23.

2.3.4 - Regional

San Joaquin Valley Air Pollution Control District

SJVAPCD CEQA Greenhouse Gas Guidance

On December 17, 2009, the SJVAPCD Governing Board adopted “Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA” and the policy, “District Policy—Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.” The SJVAPCD concluded that the existing science is inadequate to support quantification of the impacts that project specific GHG emissions have on global climatic change. The SJVAPCD found the effects of project-specific emissions to be cumulative, and that without mitigation, their incremental contribution to global climatic change could be considered cumulatively considerable. The SJVAPCD found that this cumulative impact is best addressed by requiring all projects to reduce their GHG emissions, whether through project design elements or mitigation.

The SJVAPCD’s approach is intended to streamline the process of determining if project-specific GHG emissions would have a significant effect. Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. Such plans or programs must be specified in law or adopted by

the public agency with jurisdiction over the affected resources and have a certified final CEQA document.

For non-exempt projects or those not complying with an approved plan or program, the lead agency would evaluate the project against performance-based standards and would require the adoption of design elements, known as Best Performance Standards, to reduce GHG emissions. The Best Performance Standards have not yet fully been established, though they must be designed to effect a 29-percent reduction when compared with the business-as-usual (BAU) projections identified in ARB's AB 32 Scoping Plan. Business-as-usual refers to the emissions occurring in 2020 if the average baseline emissions during the 2002-2004 period were grown to 2020 levels, without control. These standards thus would carry with them pre-quantified emissions reductions, eliminating the need for project specific quantification. Therefore, projects incorporating these Best Performance Standards would not require specific quantification of GHG emissions, and automatically would be determined to have a less than significant cumulative impact for GHG emissions. Again, the air district has not yet fully described the standards, but some general precepts have been established. For instance, for stationary source permitting projects, Best Performance Standards means "The most stringent of the identified alternatives for control of GHG emissions, including type of equipment, design of equipment and operational and maintenance practices, which are achieved-in-practice for the identified service, operation, or emissions unit class." For development projects, Best Performance Standards means "Any combination of identified GHG emission reduction measures, including project design elements and land use decisions that reduce project specific GHG emission reductions by at least 29 percent compared with business as usual."

The SJVAPCD proposes to create a list of all approved Best Performance Standards to help in the determination as to whether a proposed project has reduced its GHG emissions by 29 percent. At the time of this writing, the list of approved Best Performance Standards had not been finalized.

Projects not incorporating Best Performance Standards would require quantification of GHG emissions and demonstration that BAU GHG emissions have been reduced or mitigated by 29 percent. Quantification of GHG emissions would be required for all projects for which the lead agency has determined that an Environmental Impact Report is required, regardless of whether the project incorporates Best Performance Standards.

San Joaquin Valley Blueprint Planning Process

The San Joaquin Valley Blueprint Planning Process is a plan for the future of the San Joaquin Valley and is used to guide growth over the next 50 years. The San Joaquin Valley Blueprint Program was created by the California Department of Transportation's California Regional Blueprint Planning Program. The planning process involves seven councils of government and one regional transportation planning agency:

- Council of Fresno County Governments
- Kern Council of Governments
- Kings County Association of Governments
- Madera County Transportation Commission

- Merced County Association of Governments
- San Joaquin Council of Governments
- Stanislaus Council of Governments
- Tulare County Association of Governments

The Blueprint process promotes less land used for development, more resources for preservation, enhancing distinctive communities, and greater availability of more travel choices. The San Joaquin Valley Regional Policy Council adopted the preferred growth scenario of an average of 6.8 dwelling units per acre and the 12 Smart Growth Principles to be used as the basis of the Blueprint planning process in the San Joaquin Valley in April 2009. The 12 Smart Growth Principles listed below represent the core values of the San Joaquin Valley and reflect the regional outlook.

1. Create a range of housing opportunities and choices.
2. Create walkable neighborhoods.
3. Encourage community and stakeholder collaboration.
4. Foster distinctive, attractive communities with a strong sense of place.
5. Make development decisions predictable, fair, and cost-effective.
6. Mix land uses.
7. Preserve open space, farmland, natural beauty, and critical environmental areas.
8. Provide a variety of transportation choices.
9. Strengthen and direct development toward existing communities.
10. Take advantage of compact building design.
11. Enhance the economic vitality of the region.
12. Support actions that encourage environmental resource management.

Tulare County Regional Blueprint

The Tulare County Association of Governments (TCAG) has been an active participant in the development of the San Joaquin Valley Regional Blueprint. As part of the Blueprint process, TCAG conducted extensive public outreach to develop the County's visions statement, guiding principles, goals and objectives. The vision, guiding principles, and goals and objectives helped to form the preferred growth scenario for the region. The most important feature of TCAG's preferred growth scenario is a 25-percent increase in density for future residential development. Essentially, TCAG determined that to preserve farmland, improve air quality, and make the most out of costly existing infrastructure, building more on less land is key. TCAG's growth scenario also outlines the importance of focusing growth in existing urban areas, improving connectivity via transit and light rail, maintaining urban separators, and extending State Route 65.

2.3.5 - Local

City of Visalia

The City of Visalia does not currently have formal GHG emissions reduction plans or recommended emission threshold for determining significance associated with GHG emissions from development projects.

General Plan

The City of Visalia is currently updating its General Plan. The current General Plan includes the following applicable goals and policies related to improving air quality that may also co-benefit climate change impacts.

Land Use Element

- **Goal 2:** Improvement of air quality through proper land use planning in Visalia.
- **Policy 2.3.4:** Encourage a balance between jobs and a good mix of dwelling units within each quadrant of the community to minimize vehicle miles traveled.
- **Policy 2.3.5:** Promote a distribution of land uses, which minimizes air pollutant emissions.
- **Policy 2.3.12:** Promote use of alternative transportation modes such as bicycle, pedestrian and mass transit.

Conservation, Open Space, Recreation and Parks Element

- **Goal 1:** Conserve, restore, and enhance significant natural, cultural and historical resources to sustain the Visalia planning area's environmental quality.
- **Policy 1.3.1:** Promote maximum use of public transportation and ridesharing to reduce overall vehicular trips.
- **Policy 1.3.2:** Continue to participate in and support regional planning efforts to meet air quality goals.
- **Policy 1.3.6:** Reduce vehicle trips within the planning area and resultant air pollutants by developing improved and more extensive bikeways, bike storage facilities at major employment centers and public destinations, and pedestrian linkages through the City.
- **Policy 1.3.8:** Provide a coordinated land use pattern which, to the maximum degree practicable, results in minimizing vehicle miles traveled in the planning area.

Preliminary Draft Climate Action Plan

The City released its Draft Preliminary Climate Action Plan (CAP) in May 2010. Visalia's Draft Preliminary CAP inventory of GHG emissions in 2000 indicates that emissions by sector are commercial and industrial uses, 49 percent; transportation, 30 percent; residential uses, 20 percent; solid waste, 1 percent; and other uses (primarily propane consumption), less than 1 percent. Emissions from gasoline in the transportation sector account for 18 percent of the City's total inventoried emissions. Within the commercial and industrial sector, refrigerants account for 43 percent of the total emissions inventoried; electricity, 30 percent; natural gas, 24 percent; and propane, 2 percent. Commercial and industrial refrigerants account for 21 percent of the City's total GHG emissions. Within the residential sector, electricity accounts for 47 percent of the total emissions inventoried; natural gas, 43 percent; propane, 5 percent; and refrigerants, 5 percent.

The City's Draft Preliminary CAP shows a BAU emission forecast based on the annual average population growth rate from 2000 to 2020. This BAU forecast shows over 1.6 million MTCO₂e in 2020, a 42-percent increase from 2000 levels. However, the CAP also accounts for emissions reductions that can be expected from existing statewide initiatives, such as the Renewables Portfolio Standard, vehicle fuel efficiency requirements, low carbon fuel standard, and other new legislation. Accounting for these State efforts, Visalia community emissions are expected to grow by only 20 percent between 2000 and 2020, to about 1.4 million MTCO₂e.

The City's Preliminary Draft CAP currently proposes a 2020 community sector emissions reduction target equivalent to 7 percent below 2000 levels, and a municipal sector emissions reduction target equivalent to 14 percent below 2000 levels. According to the Preliminary Draft CAP, the recommended community reduction target equates to a reduction of 565,354 MTCO₂e from BAU in 2020. By 2020, the community will have reduced its emissions by 41,802 MTCO₂e (or over 7 percent of total emissions reduction needed) through the implementation of numerous measures. Anticipated emissions reductions from state initiatives will result in a further reduction of 255,950 MTCO₂e by 2020. The remaining reduction needed to achieve the recommended community target is 267,602 MTCO₂e. On the other hand, the Draft Preliminary CAP analysis suggests that existing state and local measures related to municipal emissions will succeed in reducing emissions below the recommended reduction target for 2020.

Visalia's Climate Change Initiatives

In January 2007, Visalia's mayor signed the "Cool Cities" pledge, part of the U.S. Mayors Climate Protection Agreement. By signing this pledge, the City adopted the goal of reducing citywide emissions to 7 percent below 1990 levels by 2012. In 2008, the City also became a partner in the San Joaquin Valley Clean Energy Organization (SJVCEO), a non-profit serving the eight-county region.

In 2008, the City of Visalia became a member of the Cities for Climate Protection (CCP) campaign sponsored by ICLEI-Local Governments for Sustainability. The CCP campaign is a global coalition of local governments working to reduce greenhouse gases at the community level. The framework the communities are using includes the following five steps: (1) conduct an inventory of local GHG emissions; (2) establish a GHG reduction target; (3) develop a climate action plan for achieving the emissions reduction target; (4) implement the climate action plan; and (5) re-inventory emissions to monitor and report on progress toward the target. Through the Draft Preliminary CAP, the City has completed draft versions of steps 1 through 3, though the CAP has not yet been finalized or adopted.

SECTION 3: MODELING PARAMETERS AND ASSUMPTIONS

3.1 - Model Selection

Air pollutant emissions can be estimated by using emission factors and a level of activity. Emission factors are the emission rate of a pollutant given the activity over time; for example, grams of NO_x per horsepower hour. The ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model.

The activity for construction equipment is based on the horsepower and load factors of the equipment. In general, the horsepower is the power of an engine—the greater the horsepower, the greater the power. The load factor is the average power of a given piece of equipment while in operation compared with its maximum rated horsepower. A load factor of 1.0 indicates that a piece of equipment continually operates at its maximum operating capacity. An air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

The California Emissions Estimator Model (CalEEMod) version 2011.1.1 was developed in cooperation with the South Coast Air Quality Management District and other air districts throughout the State. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with construction and operation from a variety of land uses. According to the SJVAPCD, CalEEMod should be used for the analysis of air quality impacts.

Emission factors are often updated and there is a normal lag time between the development of new emission factors and the integration of the new emissions factors into the appropriate models. CalEEMod uses OFFROAD2007 and EMFAC2007 emission factors and will not be updated with the new OFFROAD2011 and EMFAC2011 factors until May or June 2012, after the release of this analysis. Included in the OFFROAD2011 update is a reduction in the load factors by 33 percent compared with OFFROAD2007, which equates to a decrease in off-road construction related emissions (California Air Resources Board 2010d).

3.2 - Construction

The project would emit GHGs from upstream emission sources and direct sources (combustion of fuels from worker vehicles and construction equipment).

An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of the project. Upstream emission sources for the project include but are not limited to the following: emissions from the manufacture of cement; emissions from the manufacture of steel; and/or emissions from the transportation of building materials to the seller. The upstream emissions were not estimated because they are not within the control of the project and to do so would be speculative.

Additionally, the California Air Pollution Control Officers Association White Paper on CEQA and Climate Change supports this conclusion by stating, “The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for . . . and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level” (CAPCOA 2008). Therefore, pursuant to CEQA Guidelines Sections 15144 and 15145, upstream /life cycle emissions are speculative; no further discussion is necessary.

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from onsite and offsite activities. Onsite emissions principally consist of exhaust emissions (NO_x, SO_x, CO, CO₂, CH₄, N₂O, VOC, PM₁₀, and PM_{2.5}) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM₁₀) from disturbed soil. Additionally, paving operations and application of architectural coatings would release VOC emissions. Offsite emissions are caused by motor vehicle exhaust (NO_x, SO_x, CO, CO₂, CH₄, N₂O, VOC, PM₁₀, and PM_{2.5}) from delivery vehicles, worker traffic, and road dust (PM₁₀ and PM_{2.5}).

3.2.1 - Construction Assumptions

The proposed project would be constructed in phases beginning in 2014 with the final phase completed in 2025. The project site will be graded and paved in phases with Phases 1 and 2 occurring at the same time. Additionally, the retention basin will be constructed with Phases 1 and 2. Building construction of Phase 1 and Phase 2 would follow. Phases 3 and 4 will be graded and paved together. Building construction of Phase 3 and Phase 4 would follow. The retention basin contains 8.9 acres that may develop into 11 single-family lots. The basin cannot be abandoned until the land to the south develops and a regional basin is constructed. Ultimately, these 11 units will be constructed; however, the timing is unknown, for conservative purposes, the construction date is anticipated to be 2025. The phasing for the development of the subdivision is shown in Table 2. If the start of construction is delayed, the construction GHG emissions would decrease as construction equipment becomes cleaner through regulatory measures.

Table 2: Construction Phasing Assumptions

Phase	# of Homes	Acreage	Construction Start Date and End Date		Date of First Occupancy
1	MFR – 84 units	5.56	Site Grading	3/3/2014–5/2/2014	3/1/2015
	Triplex – 24 units	3.08	Paving	5/5/2014–6/13/2014	
	SFR – 32 units	4.63	Building Construction	6/16/2014–12/16/2014	
	Roadways	5.93	Architectural Coating (Painting)	12/17/2014–2/17/2015	

Table 2 (cont.): Construction Phasing Assumptions

Phase	# of Homes	Acreage	Construction Start Date and End Date		Date of First Occupancy
2	SFR – 35 units	5.07	Site Grading	With Phase 1	1/15/2016
	Roadways	0.93	Paving	With Phase 1	
	Retention Basin	8.90	Building Construction	7/1/2015–11/30/2015	
			Architectural Coating (Painting)	12/1/2015–12/31/2015	
3	MFR – 84 units	5.56	Site Grading	3/3/2016–5/4/2016	3/1/2017
	SFR – 35 units	5.07	Paving	5/5/2016–6/15/2016	
	Roadways	3.17	Building Construction	6/16-2016–12/16/2016	
			Architectural Coating (Painting)	12/17/2016–2/17/2017	
4	SFR – 55 units	5.98	Site Grading	With Phase 3	1/15/2018
	Roadways	1.99	Paving	With Phase 3	
			Building Construction	7/1/2017- 11/30/2017	
			Architectural Coating (Painting)	12/1/2017–12/31/2017	
5	Non-Buildable SFR – 11 units	6.60	Site Grading	3/1/2025–4/30/2025	11/1/2025
	Roadways	2.23	Paving	5/1/2025–6/1/2025	
			Building Construction	6/2/2025–9/1/2025	
			Architectural Coating (Painting)	9/2/2025–10/2/2025	
Total	360	55.90			

Source: Personal communication with Larry Simonetti, Lane Engineers and Kevin Fistolera, Diamond Oaks, LLP, 2013

3.3 - Operation

Operational emissions are those emissions that occur during operation of the project. The major sources are summarized below.

3.3.1 - Motor Vehicles

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles that would travel to and from the project site. The emissions were estimated using CalEEMod. The operational

phasing and trip generation rates are shown in Table 3. The trip generation rates were provided in the Diamond Oaks Transportation Impact Analysis Report prepared by Omni-Means in May 2013.

Table 3: Trip Generation Rates

Land Use Category	Unit	Weekday
Apartment [ITE Code 220]	Dwelling Unit	7.52 trips/unit/day
Residential Condominium [ITE Code 230]	Dwelling Unit	5.83 trips/unit/day
Single-Family Detached Housing [ITE Code 210]	Dwelling Unit	11.37 trips/unit/day
Note: ITE = Institute of Transportation Engineers Source: Omni-Means, Diamond Oaks Transportation Impact Analysis Report, 2013.		

Fleet Mix

The vehicle fleet is important because each vehicle has a different emission factor. The CalEEMod defaults for the vehicle fleet were not used in this analysis. The default values for the heavy-duty truck trips are unrealistically high—7.0 percent of trips. The default values would result in 64 medium-heavy and 223 heavy-heavy duty truck trips per weekday and do not accurately portray the amounts expected for a residential project. Research prepared by VRPA Technologies, Inc. for the Indirect Source Review Rule 9510 indicates that the actual percentage of heavy-heavy duty trucks is significantly less. The SJVAPCD has accepted the fleet mix derived by VRPA Technologies, Inc. as being appropriate for use in residential projects. The CalEEMod default fleet mix and the project analysis fleet mix for are shown in Table 4.

Table 4: Vehicle Fleet Mix

Type of Vehicle	Fleet (%)	
	CalEEMod Default	Project Analysis
Light duty automobile (LDA)	40.0	51.1
Light duty truck (LDT1)	14.3	22.5
Light duty truck (LDT2)	20.0	16.4
Medium duty vehicle (MDV)	11.1	6.4
Light-heavy duty truck (LHDT1)	2.29	0.2
Light-heavy duty truck (LHDT2)	0.9	0.1
Medium-heavy duty truck (MHDT)	1.9	0.7

Table 4 (cont.): Vehicle Fleet Mix

Type of Vehicle	Fleet (%)	
	CalEEMod Default	Project Analysis
Heavy-heavy duty truck (HHDT)	7.5	0.5
Other bus (OBUS)	0.1	0.0
Urban bus (UBUS)	0.1	0.1
Motorcycle (MCY)	0.9	1.2
School bus (SBUS)	0.2	0.1
Motor home (MH)	0.3	0.7
Source of CalEEMod: CalEEMod (not used in this analysis; shown for informational purposes). Source of Project Analysis: VRPA Technologies, Inc., 2008.		

A pass-by trip accounts for vehicles already on the roadway network that stop at the project site as they pass-by; the pass-by trips are existing vehicle trips in the community. The CalEEMod default value of 3 percent was used in the analysis. The CalEEMod default round trip lengths for an urban setting (San Joaquin Valley Air Basin, Tulare County) were used in this analysis.

3.3.2 - Natural Gas

Natural gas emissions refer to the emissions that occur when natural gas is combusted on the project site for heating water, space heating, stoves, or other uses. Criteria air pollutant and GHG emissions were estimated using CalEEMod defaults.

3.3.3 - Indirect Electricity

Indirect electricity refers to the GHG emissions generated by offsite power plants to supply the electricity required for the project. The CalEEMod defaults for energy intensity were used.

3.3.4 - Water Transport

There would be GHG emissions generated from the electricity required to transport and treat the water to be used on the project site. The CalEEMod defaults were used.

3.3.5 - Waste

There would be GHG emissions from the decomposing waste generated by the project. Emissions were estimated using CalEEMod defaults.

SECTION 4: THRESHOLDS

4.1 - Thresholds and CEQA Guidelines

The CEQA Guidelines defines a significant effect on the environment as “a substantial, or potentially substantial, adverse change in the environment.” To determine if a project would have a significant impact on GHGs, the type, level, and impact of emissions generated by the project must be evaluated.

The following GHG significance thresholds are contained in Appendix G of the CEQA Guidelines, which were amendments adopted into the Guidelines on March 18, 2010, pursuant to SB 97. A significant impact would occur if the project would:

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

CEQA Guidelines define a significant effect on the environment as “a substantial, or potentially substantial, adverse change in the environment.” To determine if a project would have a significant impact on air quality, the type, level, and impact of emissions generated by the project must be evaluated.

4.2 - Greenhouse Gas Threshold

An individual project cannot generate enough GHG emissions to effect a discernible change in global climate. However, the proposed project may participate in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on global climate change. Because these changes may have serious environmental consequences, this section will evaluate the potential for the proposed project to have a significant effect upon California’s environment as a result of its potential contribution to the enhanced greenhouse effect.

4.2.1 - Establishment of Greenhouse Gas Significance Thresholds

This analysis will evaluate whether the project would:

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

With regard to the first question, the evaluation of an impact under CEQA requires measuring data from a project against both existing conditions and a “threshold of significance.” With regard to

establishing a significance threshold, the Office of Planning and Research’s amendments to the CEQA Guidelines state that “[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.”

CEQA Guideline 15064.4(a) further states, “. . . A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use . . . ; or (2) Rely on a qualitative analysis or performance based standards.”

Here, the SJVACPD has established a menu of performance standards, some of which depend on the existence of an adopted climate action plan or the establishment of Best Performance Standards. Since neither of the above currently exists, this analysis adopts the following alternative threshold provided by SJVACPD: whether the project will reduce or mitigate GHG levels by 29 percent from BAU levels. To do so, the analysis first will quantify project-related GHG emissions under a BAU scenario, and then compare the emissions to those that would occur when all project-related design features are accounted for, and when compliance with new regulatory measures is assumed. The standard and methodology is explained in further detail, below.

In answering the second question (i.e., does the project conflict with any applicable plan, policy, or regulation), a qualitative determination will be made as to whether the project promotes attainment of California’s goals of reducing GHG emissions to 1990 levels by the year 2020 as stated in AB 32, including whether the project is consistent with goals to effect an 80-percent reduction in GHG emissions below 1990 levels by 2050, as stated in Executive Order S-03-05. The California Resources Agency has stated that, to be used for the purpose of determining significance, a plan must contain specific requirements that result in reductions of GHG emissions to a less-than-significant level. A plan meeting these requirements does not yet exist at the local, regional, or state level, and so this analysis adopts goals under AB 32. This reasoning is further explained below.

The above approach is consistent with provisions of the CEQA Guidelines amendments for GHG emissions, which state that a lead agency may take into account the following three considerations in assessing the significance of impacts from GHG emissions.

- *Consideration No. 1:* The extent to which the project may increase or reduce greenhouse gas emissions compared with the existing environmental setting. This discussion could involve a quantification of greenhouse gas emissions to the extent feasible.
- *Consideration No. 2:* Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- *Consideration No. 3:* The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project’s incremental contribution of greenhouse

gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

4.2.2 - Adoption of the SJVAPCD Threshold

The following supports and explains the election of the SJVAPCD threshold in answering the question of whether the project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

As stated previously, the SJVAPCD, which has jurisdiction over a geographic area that includes the project site, adopted the guidance document, “Addressing Greenhouse Gas Emissions Impacts Under the California Environmental Quality Act.” The guidance document does not propose a specific numeric threshold, but it requires all new projects with increased GHG emissions to implement performance based standards or otherwise demonstrate the project-specific GHG emissions have been mitigated by at least 29 percent, compared with the BAU scenario. For development projects (residential, commercial or industrial), BAU is the total baseline emissions for all emissions sources within the development type, projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period. The 29-percent emission reductions in GHGs would be composed of both (a) the emission reduction achieved through implementation of Best Performance Standards and (b) GHG emission reductions achieved since the 2002–2004 baseline period through efficiencies, such as improved energy standards, increased vehicle fuel standards, etc. Improving standards are detailed more completely below, but the following examples help to illustrate how regulatory changes will lead to GHG emissions reductions:

- The energy used by the project purchased from the grid will result in much lower emissions as the renewable energy portfolio standard is implemented over time;
- Motor vehicle GHG emissions associated with the project will also decline over time as state and federal fuel efficiency standards are implemented;
- The ARB adopted regulation to control emissions of refrigerants in commercial refrigeration systems (Regulation for the Management of High Global Warming Potential Refrigerants for Stationary Sources) is expected to reduce emissions from this source by 50 percent by 2020. Refrigerants are the second-largest source of emissions estimated for the project; and
- The project’s emissions related to electricity consumption are expected to be substantially lower than the forecasted amounts due to meeting 2005 and 2008 Title 24 Building Energy Efficiency Standards. Many of these standards are discussed in more detail below.

As applied to the proposed project, the SJVAPCD threshold means that the project’s GHG emissions in the year 2020 must be reduced by 29 percent. This can be achieved through a combination of project design features and regulations adopted since 2002–2004, including improved Building Code requirements, AB 32 scoping plan measures, and updated Building Code requirements and other regulations. Again, for a list of such requirements and regulations, please see the “Regulation Reductions” discussion, below.

The SJVAPCD emission reduction target is consistent with AB 32 emission reduction targets. Note also that the adoption of a non-zero threshold is supported by a number of experts.

On January 8, 2008, the California Air Pollution Control Officers Association (CAPCOA) released a paper that provides a common platform of information and tools for public agencies in addressing the climate change issue. The disclaimer states that it is not a guidance document but a resource to enable local decision makers to make the best decisions they can in the face of incomplete information during a period of change. The paper indicates that it is an interim resource and does not endorse any particular approach. It discusses three groups of potential thresholds, including a no significance threshold, a threshold of zero, and non-zero thresholds. Non-zero quantitative thresholds identified in the paper range from 900 to 50,000 metric tons per year. The paper also identified non-zero qualitative thresholds.

On October 24, 2008, ARB released a Preliminary Draft Staff Proposal entitled, Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under California Environmental Quality Act (Draft Staff Proposal). The staff proposal is a rough framework for determining significance thresholds. The guidance provides that if certain projects meet performance standards and remain below numeric thresholds, they will be considered less than significant. In its proposal, Staff noted that non-zero thresholds can be supported by substantial evidence, but thresholds should nonetheless be sufficiently stringent to meet the State's interim (2020) and long-term (2050) emissions reduction targets. The proposal takes different approaches for different sectors: (1) industrial projects and (2) residential and commercial projects. Although ARB Staff proposed a numerical threshold for the GHG emissions of industrial projects, none were proposed for commercial (and residential) projects. The draft proposal was very controversial and ARB Staff no longer has any plans to move forward with any final thresholds. A key preliminary conclusion from the draft thresholds, however, was that ARB Staff, in setting a numerical threshold for industrial projects and suggesting performance standards, does not believe a "zero threshold" is mandated by CEQA. It is unknown at this time whether ARB will finalize its draft proposal.

4.2.3 - Selection of Applicable Plan, Policy, or Regulation

The CEQA Guidelines provide that the key question is whether a project complies with a plan for the reduction of GHGs that contains specific requirements that would result in the reduction of such emissions to a less-than-significant level. The City of Visalia does not have a greenhouse gas reduction plan or an adopted climate action plan. Therefore, there is no local or regional greenhouse gas reduction plan applicable to the project.

In the absence of an applicable local or regional greenhouse gas reduction plan, the project's compliance with AB 32 is evaluated through compliance with the applicable measures in the Scoping Plan below.

SECTION 5: GREENHOUSE GAS IMPACT ANALYSIS

5.1 - CEQA Guidelines

CEQA Guidelines define a significant effect on the environment as “a substantial, or potentially substantial, adverse change in the environment.” To determine if a project would have a significant impact on GHGs, the type, level, and impact of emissions generated by the project must be evaluated.

The following GHG significance thresholds are contained in Appendix G of the CEQA Guidelines, which were amendments adopted into the Guidelines on March 18, 2010, pursuant to SB 97. A significant impact would occur if the project would:

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

5.2 - Impact Analysis

Greenhouse Gas Inventory

Impact AIR-6: The project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment.

Impact Analysis

This impact will evaluate the proposed project’s potential to generate GHGs that may have a significant impact on the environment.

Construction

The project would emit GHGs from upstream emission sources and direct sources (combustion of fuels from worker vehicles and construction equipment).

An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of the project. Upstream emission sources for the project include but are not limited to the following: emissions from the manufacture of cement; emissions from the manufacture of steel; and/or emissions from the transportation of building materials to the seller. The upstream emissions were not estimated because they are not within the control of the project and to do so would be speculative. Additionally, the California Air Pollution Control Officers Association White Paper on CEQA and Climate Change supports this conclusion by stating, “The full life-cycle of GHG emissions from construction activities is not accounted for . . . and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level” (CAPCOA 2008). Therefore, pursuant to

CEQA Guidelines Sections 15144 and 15145, upstream/life cycle emissions are speculative; no further discussion is necessary.

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from onsite and offsite activities. Onsite emissions principally consist of exhaust emissions (NO_x, SO_x, CO, CO₂, CH₄, N₂O, VOC, PM₁₀, and PM_{2.5}) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM₁₀) from disturbed soil. Additionally, paving operations and application of architectural coatings would release VOC emissions. Offsite emissions are caused by motor vehicle exhaust (NO_x, SO_x, CO, CO₂, CH₄, N₂O, VOC, PM₁₀, and PM_{2.5}) from delivery vehicles, worker traffic, and road dust (PM₁₀ and PM_{2.5}).

The project would emit GHGs from upstream emission sources and direct sources (combustion of fuels from worker vehicles and construction equipment). For assumptions used in estimating these emissions, please refer to Section 4. GHG emissions from project construction equipment and worker vehicles are shown in Table 5. The emissions are from all phases of construction.

Table 5: Construction Greenhouse Gas Emissions

Year	Phase	MTCO ₂ e
2014	Phase 1 and Phase 2 Grading and Paving	408
	Phase 1 - Construction	252
	<i>Total</i>	660
2015	Phase 1 – Construction	7
	Phase 2 – Construction	162
	<i>Total</i>	169
2016	Phase 3 and Phase 4 Grading and Paving	181
	Phase 3 – Construction	238
	<i>Total</i>	419
2017	Phase 3 – Construction	6
	Phase 4 – Construction	167
	<i>Total</i>	173
2025	Phase 5 – Construction	186
Grand Total Construction GHGs		1,607

The SJVAPCD does not have a recommendation for assessing the significance of construction-related emissions. The majority of construction-related emissions would occur prior to the year 2020, which is the year the State is required to reduce its GHG emissions to 1990 levels. The total GHGs from construction would be 1,607 MTCO₂e. It should be noted that the annual construction emissions

would be significantly less than the 25,000 MTCO₂e reporting threshold in ARB’s cap and trade program. Therefore, any construction-related emissions would be less than significant.

Operation

Operational or long-term emissions occur over the life of the project. The operational emissions for the project are shown in Table 6. For the assumptions and descriptions for the emission sources, please refer to Section 3.

Table 6: Project Operational Greenhouse Gases

Source	Business as Usual MTCO ₂ e	2020 MTCO ₂ e (with Regulation and Standard Measures)
Area	621	446
Energy	1,102	912
Mobile	3,722	2,532
Waste	114	57
Water	69	57
Total	5,628	4,004
Reduction		29%
Significance Threshold		29%
Are emissions significant?		No
Source: CalEEMod, 2011; FirstCarbon Solutions, 2013.		

The business as usual emissions represent emissions if they would have occurred without regulations enacted pursuant to AB 32.

The 2020 emissions with regulations represent emissions with reductions from regulations enacted as part of AB 32, in particular the following:

- *Mobile:* Pavley and Low Carbon Fuel Standard regulation reductions are calculated by CalEEMod. The estimated reduction is 32 percent of the mobile sources GHG emissions (motor vehicle emissions)
- *Electricity:* Renewable Portfolio Standards require a 33-percent renewable portfolio by the year 2020. The estimated reduction from electricity GHG emissions is 17 percent.

The 2020 emissions with regulation and standard measures include reductions from the above regulations as well as standard measures required by California code, the City of Visalia, and the SJVAPCD. These measures are discussed in Section 1.4. They include green building standards, increased energy efficiency standards, pedestrian infrastructure, wood burning prohibitions, and water conservation, and they help to reduce vehicle miles traveled, encourage alternative methods of transportation, and encourage energy and water conservation.

- A 12-percent reduction in electricity and natural gas emissions is realized from the business as usual emissions because of compliance with the 2013 Title 24 energy efficiency standards.
- The project is able to benefit from the following locational features and standard measures, which reduce mobile emissions by 6 percent:
 - Increase diversity: The proposed project is located within 0.5 mile of community serving retail uses.
 - Improve Destination Accessibility: The proposed project is located within 2.5 miles of downtown Visalia.
 - Improve Walkability Design and Pedestrian Network: The proposed project is located in an area that with existing pedestrian infrastructure and intersections. The proposed project would construct pedestrian infrastructure to encourage a walkable environment.
 - Improve Transit Accessibility: The project is located adjacent to an existing transit stop.

The above measures are represented in CalEEMod as mitigation measures; however, they are not considered mitigation for CEQA, as they are required by regulation or a result of the project’s location.

Reductions from these measures are calculated by CalEEMod and are based the methodology presented in CAPCOA’s 2010 report, “Quantifying Greenhouse Gas Mitigation Measures.”

As shown in Table 6, the reduction percentage from regulations and standard measures results in a 29-percent reduction in GHG emissions from business as usual. The percent reduction achieves the recommended threshold established by the San Joaquin Valley Air Pollution Control District to find GHG emissions less than cumulatively significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Greenhouse Gas Reduction Plans

Impact AIR-7: The project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Impact Analysis

There is no local climate action plan that would be applicable to the proposed project. Therefore, compliance with the ARB Scoping Plan is evaluated below.

Scoping Plan

Emission reductions in California alone would not be able to stabilize the concentration of GHGs in the earth’s atmosphere. However, California’s actions set an example and drive progress towards a

reduction in GHGs elsewhere. If other states and countries were to follow California’s emission reduction targets, this could avoid medium or higher ranges of global temperature increases. Thus, severe consequences of climate change could also be avoided.

The ARB Governing Board approved a Climate Change Scoping Plan in December 2008. The Scoping Plan outlines the State’s strategy to achieve the 2020 GHG emissions limit. The Scoping Plan “proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health” (ARB 2008). The measures in the Scoping Plan will be developed over the next 2 years and in place by 2012.

Project consistency with applicable strategies in the Scoping Plan is assessed in Table 7. As shown, the project is consistent with the applicable strategies in the Scoping Plan.

Table 7: Consistency with Applicable Scoping Plan Reduction Measures

Scoping Plan Reduction Measure	Project Consistency or Reason Why Not Applicable
<p>1. California Cap-and-Trade Program Linked to Western Climate Initiative. Implement a broad-based California Cap-and-Trade program to provide a firm limit on emissions. Link the California cap-and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California. Ensure California’s program meets all applicable AB 32 requirements for market-based mechanisms.</p>	<p>Not Applicable. When this cap-and-trade system begins, products or services (such as electricity) would be covered and the cost of the cap-and-trade system would be transferred to the consumers.</p>
<p>2. California Light-Duty Vehicle Greenhouse Gas Standards. Implement adopted standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.</p>	<p>Not Applicable. This is a statewide measure that cannot be implemented by a project applicant or lead agency. When this measure is initiated, the standards would be applicable to the light-duty vehicles that would access the project site.</p>
<p>3. Energy Efficiency. Maximize energy efficiency building and appliance standards; pursue additional efficiency including new technologies, policy, and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California.</p>	<p>Consistent. This is a measure for the State to increase its energy efficiency standards. However, the project would increase its energy efficiency through existing regulation and mitigation measures.</p>
<p>4. Renewable Portfolio Standard. Achieve 33 percent renewable energy mix statewide. Renewable energy sources include (but are not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas.</p>	<p>Consistent. Southern California Edison, which would provide power to the project, is in the process of increasing the percent of renewable energy in its portfolio. It is required to increase this percentage by the year 2020 pursuant to various regulations.</p>

Table 7 (cont.): Consistency with Applicable Scoping Plan Reduction Measures

Scoping Plan Reduction Measure	Project Consistency or Reason Why Not Applicable
5. Low Carbon Fuel Standard. Develop and adopt the Low Carbon Fuel Standard.	Not Applicable. This is a statewide measure that cannot be implemented by a project applicant or lead agency. When this measure is initiated, the standard would be applicable to the fuel used by vehicles that would access the project site.
6. Regional Transportation-Related Greenhouse Gas Targets. Develop regional greenhouse gas emissions reduction targets for passenger vehicles. This measure refers to SB 375.	Not Applicable. The project is not related to developing GHG emission reduction targets.
7. Vehicle Efficiency Measures. Implement light-duty vehicle efficiency measures.	Not Applicable. When this measure is initiated, the standards would be applicable to the light-duty vehicles that would access the project site.
8. Goods Movement. Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.	Not Applicable. The project does not propose any changes to maritime, rail, or intermodal facilities or forms of transportation.
9. Million Solar Roofs Program. Install 3,000 MW of solar-electric capacity under California's existing solar programs.	Consistent. This measure is to increase solar throughout California, which is being done by various electricity providers and existing solar programs. The proposed project would offer homeowners the opportunity to install rooftop solar photovoltaic facilities on their homes.
10. Medium/Heavy-Duty Vehicles. Adopt medium and heavy-duty vehicle efficiency measures.	Not Applicable. This is a statewide measure that cannot be implemented by a project applicant or lead agency. When this measure is initiated, the standards would be applicable to the vehicles that access the project site.
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.	Not Applicable. The project is not an industrial land use.
12. High Speed Rail. Support implementation of a high-speed rail system.	Not Applicable. This is a statewide measure that cannot be implemented by a project applicant or lead agency.
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.	Consistent. The State's goal is to increase the use of green building practices. The project would implement some green building strategies through project design features.

Table 7 (cont.): Consistency with Applicable Scoping Plan Reduction Measures

Scoping Plan Reduction Measure	Project Consistency or Reason Why Not Applicable
14. High Global Warming Potential Gases. Adopt measures to reduce high global warming potential gases.	Not Applicable. When this measure is initiated, it would be applicable to the high global warming potential gases that would be used by the project (such as in air conditioning and refrigerators).
15. Recycling and Waste. Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.	Not Applicable. The project would not contain a landfill. The State is to help increase waste diversion. The project would reduce waste with implementation of mitigation.
16. Sustainable Forests. Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation.	Not Applicable. The project site is in an urban, built-up condition. No forested lands exist onsite.
17. Water. Continue efficiency programs and use cleaner energy sources to move and treat water.	Consistent. This is a measure for state and local agencies. However, the project would comply with California Green Building standards to reduce water use by 20 percent.
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.	Not Applicable. The project site is in an urban, built-up condition. No grazing, feedlot, or other agricultural activities that generate manure occur onsite or are proposed to be implemented by the project.
Source of ARB Scoping Plan Reduction Measure: California Air Resources Board 2008a. Source of Project Consistency or Applicability: FirstCarbon Solutions.	

Aside from helping to implement goals and measures contemplated in ARB’s Scoping Plan, the project design features and standard measures likely will help to implement measures contemplated by the SJVAPCD’s CEQA guidance document. The SJVAPCD notes that projects can reduce GHG emissions through project designs that reduce vehicle miles traveled through features that promote pedestrian access and use of public transportation. Land use planning decisions, such as creating mixed-use development, discouraging leapfrog development, and creating favorable jobs to housing ratios can significantly reduce vehicle miles traveled and the associated GHG emissions. The project design features are consistent with this strategy.

In terms of land use planning decisions, the project would constitute development within an established community and would not be opening up a new geographical area for development such that it would draw mostly new trips, or substantially lengthen existing trips. The project location and associated transportation infrastructure are consistent with the SJVAPCD’s approach to reducing GHG emissions (as well as provisions in ARB’s Scoping Plan and SB 375 that discourage leapfrog development and smart growth).

In summary, the project would not obstruct attainment of any of the goals established under AB 32. The project would comply with all present and future regulatory measures developed in accordance

with AB 32 and ARB's Scoping Plan, and will incorporate a number of features that would minimize GHG emissions. Such features also are consistent with the CAPCOA paper and general guidance provided by the SJVAPCD.

It should be noted that, with regard to AB 32 and ARB's Scoping Plan, reductions in GHG emissions need not be equal among all sectors (e.g., the 1990-based reduction levels apply on a statewide basis and are not independently required of every individual project or sector). The residential sector accounts for only approximately 6 percent of GHG emissions in the State; arguably the key means by which to meet the AB 32 and S-3-05 goals will be to target the transportation, industrial, and electricity production sectors, which combined create approximately 85 percent of the State's emissions. At the same time, the project design features and applicable laws do result in a forecasted 30-percent reduction from BAU levels, which meets the recommended District threshold of 29-percent reduction from BAU levels. This not only shows compliance with District thresholds but it also promotion of AB 32 goals for 2020. Impacts are less than significant.

Regarding goals for 2050 under Executive Order S-3-05, at this time it is not possible to quantify the emissions savings from future regulatory measures, as they have not yet been developed; nevertheless, it can be anticipated that operation of the project would comply with whatever measures are enacted that state lawmakers decide would lead to an 80-percent reduction below 1990 levels by 2050. Note again that the project already includes several project design features that exceed regulatory requirements and reduce vehicle miles traveled.

Accordingly, taking into account the proposed project's emissions, project design features, standard measures and the progress being made by the State towards reducing emissions in key sectors such as transportation, industry, and electricity, the project furthers the State's goals of reducing GHG emissions to 1990 levels by 2020 and an 80-percent reduction below 1990 levels by 2050, and does not obstruct their attainment.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

SECTION 6: REFERENCES

The following references were used in the preparation of this analysis and are referenced in the text and/or were used to provide the author with background information necessary for the preparation of thresholds and content.

- Attorney General. 2010. Office of the California Attorney General. Addressing Climate Change at the Project Level. Updated January 6, 2010. Website: http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf. Accessed February 19, 2013.
- CalEEMod. California Emissions Estimator Model. Version 2011.1.1. Website: <http://caleemod.com/>. Accessed December 18, 2011.
- California Air Pollution Control Officers Association. 2008. CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. Website: www.capcoa.org/. Accessed December 18, 2011.
- California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. August 2010. Website: www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed May 7, 2012.
- California Air Resources Board. 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. Website: www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf. Accessed May 7, 2012.
- California Air Resources Board. 2008a. Climate Change Scoping Plan, a framework for change. Website: www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed May 7, 2012.
- California Air Resources Board. 2008b. Preliminary Draft Staff Proposal Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act. Website: www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf. Accessed May 7, 2012.
- California Air Resources Board. 2010. Greenhouse Gas Inventory – 2020 Forecast. Website: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>. Accessed May 7, 2012.
- California Air Resources Board. 2011. California Greenhouse Gas Emissions Inventory. Website: www.arb.ca.gov/cc/inventory/data/data.htm. Accessed May 7, 2012. (Note: Data is used in Figure 2.)

References

- California Air Resources Board. 2011. Status of Scoping Plan Recommended Measures. Website: www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf. Accessed December 18, 2011.
- California Climate Change Center. 2006. Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center. July 2006. CEC-500-2006-077. Website: www.scc.ca.gov/webmaster/ftp/pdf/climate_change/assessing_risks.pdf. Accessed May 7, 2012.
- California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. Website: www.climatechange.ca.gov/adaptation/. Accessed December 18, 2011.
- California Public Utilities Commission. 2011. Large IOU RPS Procurement Data 2003-2010. Website: <http://www.cpuc.ca.gov/PUC/energy/Renewables/>; also <http://www.cpuc.ca.gov/NR/rdonlyres/B5AF672B-ABB6-4B0F-8F52-AF78D47016770/CaliforniaRPSProcurementSummary20032010.xls>. Accessed February 20, 2013.
- Department of Water Resources, the Resources Agency, State of California. October 2008. Managing an Uncertain Future, Climate Change Adaptation Strategies for California's Water. www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf. Accessed May 7, 2012.
- Enstrom, James E. 2008. Misrepresentation of the Health Effects of Diesel Exhaust in California by the California Air Resources Board and the Goods Movement Emission Reduction Plan. Website: www.scientificintegrityinstitute.org/GMERPEnstrom050808.pdf. Accessed May 7, 2012.
- Governor's Office of Planning and Research. 2008. Technical Advisory. CEQA AND CLIMATE CHANGE: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review. Website: <http://opr.ca.gov/docs/june08-ceqa.pdf>. Accessed May 7, 2012.
- Intergovernmental Panel on Climate Change. 2001. Climate Change 2001: The Scientific Basis. Website: http://www.grida.no/climate/ipcc_tar/wg1/pdf/WG1_TAR-FRONT.pdf. Accessed May 7, 2012.
- Intergovernmental Panel on Climate Change. 2007a. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, Website: www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html. Accessed April 5, 2012.

- Intergovernmental Panel on Climate Change. 2007b. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K. and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland. Website: www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html. Accessed May 7, 2012.
- McIntyre, S. and R. McKittrick. 2003. Corrections to the Mann et al. (1998) Proxy Data Base and Northern Hemisphere Average Temperature Series. *Energy and Environment*, Vol. 14, No. 6, pp. 751–772. Website: <http://www.uoguelph.ca/~rmckitri/research/MM03.pdf>. Accessed May 7, 2012.
- McKittrick. 2005. What is the 'Hockey Stick' Debate About? APEC Study Group, Australia. Website: www.uoguelph.ca/~rmckitri/research/McKittrick-hockeystick.pdf. Accessed May 7, 2012.
- Moser et al. 2009. Moser, Susie, Guido Franco, Sarah Pittiglio, Wendy Chou, Dan Cayan. 2009. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2008-071. Website: www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF. Accessed May 7, 2012.
- NOConsensus.org. 2010. IPCC Report Card. Website: www.noconsensus.org/ipcc-audit/IPCC-report-card.php. Accessed May 7, 2012.
- Omni-Means, Ltd. 2013. Diamond Oaks Transportation Impact Analysis Report. May.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002. Guide for Assessing and Mitigating Air Quality Impacts. Website: www.valleyair.org/transportation/ceqa_guidance_documents.htm. Accessed July 30, 2012.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009a. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. Website: www.valleyair.org/transportation/ceqa_guidance_documents.htm. Accessed July 30, 2012.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009b. Final Staff Report. Addressing Greenhouse Gas Emissions under the California Environmental Quality Act. Website: www.valleyair.org/transportation/ceqa_guidance_documents.htm. Accessed July 30, 2012.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). 2012. Draft Guidance for Assessing and Mitigating Air Quality Impacts. May 31. Website: www.valleyair.org/transportation/ceqa_guidance_documents.htm. Accessed July 30, 2012.
- U.S. Environmental Protection Agency. 2009d. February. Potential for Reducing Greenhouse Gas Emissions in the Construction Sector. Website: www.epa.gov/sectors/pdf/construction-sector-report.pdf. Accessed February 21, 2013.

References

- U.S. Environmental Protection Agency. 2011c. 2011 U.S. Greenhouse Gas Inventory Report. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009. EPA 430-R-11-005. Website: www.epa.gov/climatechange/emissions/usinventoryreport.html. Accessed December 22, 2011. (Note: data is used in Figure 2.)
- United Nations Framework Convention on Climate Change. 2010. National Greenhouse Gas Inventory Data for the Period 1990-2008. Website: <http://unfccc.int/resource/docs/2010/sbi/eng/18.pdf>. Accessed December 22, 2011. (Note: data is used in Figure 2.)
- Von Storch et al. 2004. Reconstructing Past Climate from Noisy Data. *Science*, Vol. 306, pp. 679–682. Website: www.sciencemag.org/content/306/5696/679.abstract. Accessed May 7, 2012.