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## 3.7 - Greenhouse Gas Emissions

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### 3.7.1 - Introduction

This section describes the existing greenhouse gas emissions and potential effects from project implementation on the site and its surrounding area. Michael Brandman Associates performed greenhouse gas impact analysis for the proposed project, which included emissions modeling using EMFAC2007 and qualitative assessments of greenhouse gas emissions. Emissions output is provided in Appendix B.

### 3.7.2 - Environmental Setting

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. Climate change is caused by greenhouse gases emitted all around the world from a variety of sources, including the combustion of fuel for transportation and heat, cement manufacturing, and refrigerant emissions.

#### Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as greenhouse gases. The effect is analogous to the way a greenhouse retains heat. Common greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit greenhouse gases. The presence of greenhouse gases 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.

Individual greenhouse gas 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 greenhouse gas is a measure of how much a given mass of a greenhouse gas is estimated to contribute to global warming. To describe how much global warming a given type and amount of greenhouse gas may cause, use is made of a metric called the carbon dioxide equivalent. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent reference gas, carbon dioxide. For example, methane's warming potential of 21 indicates that methane has a 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 greenhouse gas multiplied by its global warming potential.

Greenhouse gases as defined by AB 32 include the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Select greenhouse gases are summarized in Table 3.7-1.

**Table 3.7-1: Greenhouse Gases**

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide is also known as laughing gas and 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, decay of organic matter, and cattle.
Carbon dioxide	Carbon dioxide (CO <sub>2</sub> ) 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 3.7-1 (cont.): 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.		

**Emissions Inventories and Trends**

*International, National, and State*

Emissions worldwide were approximately 49,000 million metric tons of carbon dioxide equivalents (MMT<sub>CO<sub>2</sub>e</sub>) in 2004 (IPCC 2007b). In 2004, greenhouse gas emissions in the United States (U.S.) were 7,074.4 million M<sub>TCO<sub>2</sub>e</sub> are approximately 6.7 percent of the emissions in the U.S. California is the second largest contributor of greenhouse gases in the U.S. and the sixteenth largest in the world (CEC 2006).

According to the Air Resource Board’s (ARB’s) recent greenhouse gas inventory for the State, the single largest source of greenhouse gases in California is transportation, contributing 37 percent of the State’s total greenhouse gas emissions in 2008. Electricity generation (both in and out of state) is the second largest source, contributing 25 percent of the State’s greenhouse gas emissions. The inventory for California’s greenhouse gas emissions between 2000 and 2008, by even years, is presented in Table 3.7-2. As shown in Table 3.7-2, aviation is a subcomponent of the Transportation Sector and generated approximately 0.6 percent to 0.5 percent of the state’s emissions inventory between 2000 and 2008.

**Table 3.7-2: California Greenhouse Gas Inventory 2000-2008**

Main Sector <sup>1</sup>	Emissions MMT <sub>CO<sub>2</sub>e</sub>				
	2000	2002	2004	2006	2008
Agriculture & Forestry	25.63	28.61	29.01	30.08	28.25
Commercial	12.80	14.44	13.20	13.01	14.69
Electricity Generation (Imports)	44.31	56.00	62.92	51.68	61.58
Electricity Generation (In state)	60.76	51.57	58.09	56.99	55.74
Industrial	104.56	103.57	97.76	97.80	100.03
Not Specified	8.72	10.26	11.85	13.18	14.02
Residential	30.13	29.35	29.34	28.46	28.45

**Table 3.7-2 (cont.): California Greenhouse Gas Inventory 2000-2008**

Main Sector <sup>1</sup>	Emissions MMTCO <sub>2</sub> e				
	2000	2002	2004	2006	2008
Transportation	171.13	180.36	181.71	184.11	174.99
Aviation <sup>2</sup>	2.68	2.66	2.64	2.68	2.42
Total	458.03	474.15	483.88	475.31	477.74
Notes: MMTCO <sub>2</sub> e = million metric tons of carbon dioxide equivalent <sup>1</sup> Excludes military sector, aviation, and international marine bunker fuel. <sup>2</sup> Includes only intrastate aviation emissions. Aviation is a subset of the Transportation sector. Source: California Air Resources Board 2010c.					

*Local Inventory*

In 2009, Sacramento County prepared a year 2005 greenhouse gas emissions inventory for the unincorporated portions of the county, as well as the cities of Citrus Heights, Elk Grove, Folsom, Galt, Iselton, Rancho Cordova, and Sacramento. The County's 2005 inventory is provided in Table 3.7-3. In preparing the 2010 Public Draft Climate Action Plan, the City of Elk Grove updated and revised the 2005 emissions inventory prepared by the County. The City of Elk Grove 2005 inventory is provided in Table 3.7-4.

**Table 3.7-3: Unincorporated Sacramento County Greenhouse Gas Inventory 2005**

Sector	Emissions MTCO <sub>2</sub> e	Percent of Inventory
Residential	1,033,142	15.8
Commercial and Industrial	770,025	11.7
Industrial Specific	2,104	0.0
On-Road Transportation	3,610,937	55.1
Off-road Vehicle Use	236,466	3.6
Waste	201,350	3.1
Wastewater Treatment	54,391	0.8
Agriculture	197,132	3.0
High Global Warming Potential Greenhouse Gases	228,768	3.5
Water-Related	22,156	0.3
Sacramento International Airport	200,404	3.1
<b>Total</b>	<b>6,556,875</b>	<b>100.0</b>
Notes: MTCO <sub>2</sub> e = metric tons of carbon dioxide equivalent Source: Sacramento County Department of Environmental Review and Assessment, 2009a.		

**Table 3.7-4: Elk Grove Greenhouse Gas Inventory 2005**

Sector	Emissions MMTCO <sub>2</sub> e	Percent of Inventory
Residential	229,841	31.2
Commercial and Industrial	101,607	13.8
On-Road Transportation	357,309	48.4
Waste	39,791	5.4
Water-Related	4,371	0.6
Agriculture	4,919	0.7
<b>Total</b>	<b>718,534</b>	<b>100.0</b>
Notes: MTCO <sub>2</sub> e = metric tons of carbon dioxide equivalent Source: City of Elk Grove, 2010.		

The County-prepared inventory showed the City of Elk Grove generated a total of 842,971 MTCO<sub>2</sub>e in 2005. The City’s revised inventory shows a total of 718,534 MTCO<sub>2</sub>e in 2005. Revisions to the City’s inventory includes (but is not limited to): revised vehicle miles traveled (VMT), omit off-road equipment and vehicle emissions, omit residential wood burning emissions, omit wastewater treatment and discharge emissions, and omit high global warming potential emissions (such as fugitive refrigerant emissions).

**Potential Environmental Effects**

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. The Intergovernmental Panel on Climate Change predicted that 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).

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 21<sup>st</sup> 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 heat-trapping 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.** In forests, climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

#### *Inundation by Sea Level Rise and Increased Flooding Severity*

The Pacific Institute, with support from the California Energy Commission, California Department of Transportation, and the Ocean Protection Council, prepared impact maps showing the potential extent of coastal flooding and erosion under one scenario that involved a sea level rise of 1.4 meters (55 inches). The impact maps were prepared for and are available in the document *Impacts of Sea-Level Rise on the California Coast (CEC 2009)*. However, the maps do not extend past the southwestern most portion of Sacramento County (Antioch North map).

This 1.4-meter sea level rise scenario represents the medium to high greenhouse gas emissions scenarios, but does not reflect the worst-case that could occur. The scenario estimates that the 1.4-meter sea-level rise would occur by 2100. The project site is located between approximately 3 meters and 21 meters above mean sea level. Therefore, the project site is located outside of the estimated 1.4-meter sea-level rise inundation area.

As described in Section 2, Project Description, and Section 3.9, Hydrology and Water Quality, the westernmost portions of the proposed SOIA Area lie within the 100-year flood zone as shown on the Federal Emergency Management Agency (FEMA) approved floodplain maps. In addition, the SOIA Area does not lie within 200- or 500-year flood zone. The California Department of Water Resources' Awareness Floodplain Mapping project identifies pertinent flood hazard areas by 2015 for areas that are not mapped under the Federal Agency Management Agency's (FEMA) National Flood Insurance Program (NFIP) with the intent to provide communities and residents an additional tool in understanding potential flood hazards currently not mapped as a regulated floodplain.

Two distinct DWR Awareness Floodplains are identified in the SOIA Area. A minor extension of DWR Awareness Floodplain surrounds the existing agricultural canal located upstream of Elk Grove Creek and south of the intersection of Grant Line Road and Bradshaw Road. In addition, a DWR Awareness Floodplain is located in the westernmost portion of the SOIA Area, extending from the northwestern edge of the FEMA-identified 100-year floodplain towards and to the north of Kammerer Road.

### **3.7.3 - Regulatory Framework**

International and federal agreements have been enacted to deal with climate change issues. The State of California has enacted key legislation in an effort to reduce its contribution to climate change, as discussed below.

#### **International**

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

**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 greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas 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 greenhouse gases or engage in emissions trading. More than 170 countries are currently participating in the Kyoto Protocol. Industrialized countries are required to reduce their greenhouse gas 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 end of the first commitment period of the Kyoto Protocol in 2012.

## **National**

**Clean Vehicles.** *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 greenhouse gases, 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 held that petitioners have a standing to challenge the EPA and that the EPA has statutory authority to regulate greenhouse gases emissions from new motor vehicles.

Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light 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 greenhouse gas 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 will now begin 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 greenhouse gas 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 greenhouse gas reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires reporting of greenhouse gas 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 greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of greenhouse gas emissions are required to submit annual reports to the EPA.

**Greenhouse Gas Endangerment.** On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under Section 202(a) of the Clean Air Act: 1) 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. 2) 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.

**New Source Review.** The EPA issued a final rule on May 13, 2010, which establishes thresholds for greenhouse gases 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 greenhouse gas emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest greenhouse gas emitters—power plants, refineries, and cement production facilities.

### **State**

**Title 24.** Although not originally intended to reduce greenhouse gases, 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 (which became effective January 1, 2010). Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas 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:

- Short-term bicycle parking. If a commercial project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack (5.106.4.1).

- Long-term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space (5.106.4.2).
- Designated parking. Provide designated parking in commercial projects for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.6.2 (5.106.5.2).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling.
- 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. Utilizing nonpotable 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.
- Water meters. Separate water meters for buildings in excess of 50,000 square feet or buildings projected to consume more than 1,000 gallons per day.
- 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 ARB to develop and adopt regulations that reduce greenhouse gases 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.** California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for greenhouse gas 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. The Climate Action Team's Report to the Governor in 2006 contains recommendations and strategies to help ensure the 2020 targets in Executive Order S-3-05 are met (Climate Action Team 2006).

**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.

**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 greenhouse gas 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 greenhouse gas 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 greenhouse gas 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 adequately analyze the effects of greenhouse gases 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 greenhouse gas emissions. 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 greenhouse gas 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 greenhouse gas 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 greenhouse gas 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 greenhouse gas 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 greenhouse gas 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 greenhouse gas questions.

**AB 32.** The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that greenhouse gases 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 greenhouse gases. 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 greenhouse gas emissions level of 427 million metric tons of carbon dioxide equivalent (MMT<sub>CO<sub>2</sub>e</sub>) 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 MMT<sub>CO<sub>2</sub>e</sub>. Emissions in 2020 in a "business as usual" scenario are estimated to be 596 MMT<sub>CO<sub>2</sub>e</sub>.

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 MMT<sub>CO<sub>2</sub>e</sub> 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 2008). The Scoping Plan identifies recommended measures for multiple greenhouse gas 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 greenhouse gas 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 greenhouse gas emission reductions. On March 18, 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.

**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 greenhouse gas

emissions, which emits over 40 percent of the total greenhouse gas 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 greenhouse gas emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies. 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.
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.

**SB 1078, SB 107, and Executive Orders S-14-08 and S-21-09.** 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 107 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.



## **Local**

### **Sacramento County**

#### *Climate Action Plan (CAP)*

Sacramento County released a Draft Climate Action Plan (CAP) in May 2009. The Draft CAP, also identified as the Phase 1 CAP, contains the greenhouse gas emissions inventory for the entire county and the unincorporated portion of the County, as well as the inventory for County government operations. In addition, the Draft CAP identifies existing and potential actions to reduce greenhouse gas emissions from transportation, energy, water management, waste management and recycling, agriculture, and open space. Finally, the Draft CAP identifies steps the County will take after adoption of the Phase 1 CAP.

The Phase 2 CAP will be the implementation plan for addressing emissions from County government operations and land uses within the unincorporated county. The Phase 2 CAP will be prepared in two distinct parts to address these two sources (County operations and unincorporated county) of greenhouse gas emissions.

### **City of Elk Grove**

#### *General Plan*

The City of Elk Grove General Plan establishes goals and policies to guide both present and future development within the City's jurisdiction. Therefore, the City of Elk Grove's General Plan policies that affect the generation of greenhouse gases that may apply to potential future development in the SOIA Area are provided herein. Many of the policies and actions cited in Section 3.3, Air Quality, of this EIR reduce greenhouse gases. In addition, the following policies would be applicable to future development in the SOIA Area, if annexed into the City.

- **Policy PF-5:** The City supports the use of reclaimed water for irrigation wherever feasible.
- **Policy CAQ-1:** Reduce the amount of water used by residential and non-residential uses by encouraging water conservation.
- **CAQ-1-Action 1:** Implement the City's Water Conservation Ordinance.
- **CAQ-1-Action 2:** Actively encourage water conservation by both agricultural and urban water users.
- **CAQ-1-Action 3:** Work with urban and agricultural water purveyors to establish long range conservation plans which set specific conservation objectives and utilize, to the extent possible, a common planning horizon, plan framework and estimating/ forecasting procedures.
- **CAQ-1-Action 4:** Promote the use of drought-tolerant vegetation to minimize water consumption by providing information to developers and designers.

#### *Sustainability Element and Climate Action Plan*

The City of Elk Grove has developed a draft Sustainability Element and Climate Action Plan (CAP). A Draft EIR is being developed for both the Sustainability Element and CAP, collectively referred to

as the SECAP. The Draft EIR notice of preparation was available for public comment from June 10, 2011 to July 11, 2011. The purpose of the CAP is to identify how the City will achieve greenhouse gas emission reduction target of 15 percent by the year 2020 and to create a path to obtain 2050 State targets associated with Governor's Order S-03-05. The CAP provides goals and associated measures in the sectors of energy use, transportation, land use, water, and solid waste. In addition, the CAP provides goals and measures for longer-term adaptation to the potential risks associated with climate change. More specifically, the CAP:

- Identifies sources of greenhouse gas emissions from sources within the City's jurisdictional/political boundary and estimates how these emissions may change over time.
- Discusses the various outcomes of reduction efforts and how these reduction efforts can be implemented and advertised.
- Provides energy use, transportation, land use, water use, and solid waste strategies to reduce Elk Grove's greenhouse gas emissions levels to 15 percent below 2005 levels by 2020.
- Provides methods for reducing the City's greenhouse gas emissions consistent with the direction of the State of California through the Global Warming Solutions Act (AB 32), Governor's Order S-03-05, Public Resources Code Section 21083.3(b,d), and CEQA Guidelines Section 15064.4. [The California Environmental Quality Act (CEQA) Guidelines encourage the adoption of policies or programs as a means of addressing comprehensively the cumulative impacts of projects. See State CEQA Guidelines, §15064(h)(3), §15130(d).]
- Provides substantial evidence that the emissions reductions estimated in the CAP are feasible

The SECAP contains an emissions inventory for the community and municipal operations of the City of Elk Grove for year 2005, 2020, and 2025. The City modeled future emissions growth on projected trends in energy use, driving habits, job growth, and population growth in 2020 and 2025. Although emissions projections were based on growth, they were not based on growth within particular geographic areas. Therefore, the SECAP future year inventories may encompass a portion of the growth within the SOIA Area. However, as the land within the SOIA Area exceeds the amount calculated to be required to support projected growth, the SECAP future-year inventories would not cover the entirety of the SOIA Area under the project's land use assumptions.

The SECAP and associated Environmental Impact Report (EIR) are intended to serve as programmatic tiering documents for the purposes of CEQA as allowed under Section 15183.5 of the CEQA Guidelines. A tiering document front-loads the analysis needed for many projects in order to decrease the time and money that would be needed for individual analyses for each project. In the case of the CAP, the City is creating a tiering document that addresses the elements identified at CEQA Guidelines Section 15183.5(b)(1) and establishes the City's consistency with state greenhouse gas legislation such as AB 32 and SB 97 through the year 2020.

### **SMAQMD**

The SMAQMD formally began a Climate Protection Program in March 2006, with a goal to include outreach and education, data collection and analysis, and provide support and leadership for local, state, and national efforts to reduce greenhouse gas emissions. On August 28, 2008, the SMAQMD Board of Directors authorized the District Air Pollution Control Officer to direct staff to begin program development on several enhancements to the Climate Protection Program. Those enhancements include:

1. The creation of a greenhouse gas emissions “bank.”
2. The creation of a program that would facilitate greenhouse gas mitigation for CEQA purposes.
3. An enhanced reporting system.
4. Assurances that climate protection measures do not cause increases in criteria pollutants.

In addition, the SMAQMD joined the CCAR in 2006 and has completed its own emissions inventory for 2005, 2006, and 2007. The SMAQMD held a “Greenhouse Gas and Climate Change Impact” training session April 20, 2009. The training described impact analysis techniques and threshold of significance approaches for climate change impacts.

### **Sacramento Regional Council of Governments**

SACOG has a standing Climate & Air Quality Committee to assess air quality, energy conservation, climate change, and related technologies.

#### *SB 375 Regional Targets*

The MPO for the project area is SACOG, which will prepare an SCS as a component of its Metropolitan Transportation Plan, covering the six-county Sacramento Region (El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba). SACOG will participate in the scenario modeling described above. The Metropolitan Transportation Plan (MTP) will document the region’s greenhouse gas emissions, and it will include the plan to meet the regional target. SACOG is responsible for preparing the MTP every 4 years; most recently, it adopted the 2035 MTP in March 2008. SACOG anticipates adopting a new MTP by the end of 2011.

ARB adopted the following greenhouse gas reduction targets for passenger vehicles for 2020 and 2035 for the SACOG region (per capita reduction as measured from the 2005 baseline):

- Target for 2020 = 7 Percent
- Target for 2035 = 16 Percent

### **Sacramento Area Green Partnership**

The Sacramento Area Green Partnership meets quarterly and comprises Sacramento area cities, the County of Sacramento, and various other partners working together on opportunities for regional collaboration regarding climate change and local government. The first work product of the Partnership was a draft Greenhouse Gas Emissions Inventory for Sacramento County.

#### **3.7.4 - Methodology**

The SMAQMD updated its CEQA Guide to Air Quality Assessment in 2009, with additional revisions in April and June of 2011. The updated document includes chapters for project-level analysis and the chapter Program-Level Analysis of General and Area Plans. The analysis utilizes the SMAQMD's guidance to the extent practicable, and examines the SOI change in relationship to Appendix G, Environmental Checklist, of the CEQA Guidelines greenhouse gas impact questions.

Operational on-road mobile emissions for the potential future development of the project based on the land use assumptions provided in Section 2.2 were modeled using EMFAC2007.

#### **3.7.5 - Thresholds of Significance**

The SMAQMD does not have an adopted threshold of significance for greenhouse gases. According to Appendix G, Environmental Checklist, of the CEQA Guidelines, greenhouse gas emissions impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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

#### **3.7.6 - Project Impacts and Mitigation Measures**

This section discusses potential indirect impacts associated with the development of the project and provides mitigation measures where appropriate.

### **Greenhouse Gas Emissions**

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

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#### **Impact Analysis**

The proposed project would involve the extension of the City of Elk Grove's SOI to include the 7,869-acre project site. As stated in Section 2, land use assumptions were developed for this EIR with the intent to provide a general program level concept of growth that may result from future development in the SOIA Area, and allow LAFCo to understand probable future and potential environmental effects that may result from future anticipated growth.

The Transportation Impact Study prepared by Fehr and Peers calculated that full buildout of the SOIA Area under the assumed conceptual land uses provided in Section 2.2 would result in approximately 218,000 trips per day and 1,389,072 daily vehicle miles traveled (VMT). All calculations are based on the conceptual land uses.

EMFAC2007, BURDEN, was used to calculate future carbon dioxide emissions for the year 2020, 2025 and 2035, consistent with the AB 32 emission reduction goal year, the City’s CAP emission reduction target year, and the cumulative analysis scenario provided in the Transportation Impact Study. EMFAC output is provided as Appendix B to this EIR.

EMFAC is not currently used as the basis for ARB’s official GHG inventory, which is based on fuel usage information. The current version of EMFAC applies a single CO<sub>2</sub> factor that is unchanged throughout future years and does not account for emission reductions resulting from implementation of recently adopted regulations, such as the Pavley Regulations. In addition, EMFAC does not include reductions of the carbon content of the fuels in future years. Since CO<sub>2</sub> is calculated on carbon content of fuel, it is assumed that the Executive Order S-1-07, the Low Carbon Fuel Standard (issued on January 18, 2007), which that calls for a reduction of at least 10 percent in the carbon intensity of California’s transportation fuels by 2020, will be implemented, and all diesel vehicles will be using the lower carbon fuel and the resultant CO<sub>2</sub> emissions will be proportionally reduced. Therefore, EMFAC2007 greenhouse gas forecasts the same emissions estimate for each year, which is an overestimate for future years. The calculated CO<sub>2</sub> emissions from potential future development are provided in Table 3.7-5. The calculated emission reduction from implementation of regulations is provided in Table 3.7-6.

**Table 3.7-5: On-Road Mobile CO<sub>2</sub> from SOIA Area Potential Future Development**

Analysis Year	Tons CO <sub>2</sub> per Day	Tons CO <sub>2</sub> per Year	MTCO <sub>2</sub> e per Year
2020, 2025, 2030	760	277,400	251,657
Notes: MTCO <sub>2</sub> e = metric tons of carbon dioxide equivalent Source: Michael Brandman Associates, 2011. Appendix B			

**Table 3.7-6: Regulatory Emission Reductions for On-Road Mobile CO<sub>2</sub>**

BAU Inventory (MTCO <sub>2</sub> e per Year)	Sector % of BAU subject to Regulations	Inventory Subject to Regulation	Regulation Reduction for the Sector (%)	Reductions from Regulations MTCO <sub>2</sub> e
251,657	On-road passenger vehicles 80% of BAU	201,326	25.3% (Pavley, LCFS, Eff.)	50,935
	Heavy/medium duty vehicles 18% of BAU	45,298	9.1% (LCFS, Eff.)	4,122
Total		246,624	22%	55,058
Notes: LCFS = low carbon fuel standard; Eff. = efficiency regulations BAU = Business as Usual. Consists of EMFAC output. MTCO <sub>2</sub> e = metric tons of carbon dioxide equivalent Source: Michael Brandman Associates, 2011. Appendix B				

The EMFAC output estimates the assumed buildout of the SOIA Area would result in 251,657 MTCO<sub>2</sub>e per year. Implementation of state regulations would reduce emissions by 50,935 MTCO<sub>2</sub>e per year. Therefore, potential future development of the SOIA could result in approximately 196,600 MTCO<sub>2</sub>e per year of greenhouse gas emissions from mobile sources.

The SECAP’s “Business as Usual” scenario for years 2020 and 2025 emissions inventories resulted in the following emissions distribution (rounded to integers):

- Residential: 31 percent of inventory,
- Commercial/Industrial: 18 percent of inventory,
- Transportation: 45 percent of inventory,
- Agricultural: 0 percent of inventory, and
- Waste: 5 percent of inventory.

The total greenhouse gas inventory was calculated for the SOIA Area utilizing the on-road mobile emissions, as provided in Table 3.7-5 and Elk Grove’s estimated future-year inventory distribution by emissions source. The resulting emissions inventory is provided in Table 3.7-7.

**Table 3.7-7: SOIA Area Calculated Greenhouse Gas Inventory (2020 and 2025)**

Sector	Emissions MMTCO <sub>2</sub> e	
	2020	2025
Residential	169,630	170,944
Commercial and Industrial	98,961	100,613
On-Road Transportation	251,657	251,657

**Table 3.7-7 (cont.): SOIA Area Calculated Greenhouse Gas Inventory (2020 and 2025)**

Sector	Emissions MMTCO <sub>2</sub> e	
	2020	2025
Waste	670	—
Water-Related	29,367	29,594
Agriculture	3,708	3,753
Total	553,992	556,561
Notes: MTCO <sub>2</sub> e = metric tons of carbon dioxide equivalent Source: MBA 2011.		

The majority of the project site is located within the City of Elk Grove General Plan “Planning Area” identified outside of the city limits, as defined in Section 3.10, Land Use and Planning. As discussed in the Regulatory Setting, the City of Elk Grove is currently developing the draft General Plan Sustainability Element and Climate Action Plan (CAP). The purpose of the CAP is to identify how the City will achieve greenhouse gas emission reduction target of 15 percent by the year 2020 and to create a path to obtain 2050 State targets associated with Governor’s Order S-03-05. The Draft CAP includes the City’s calculated 2005 greenhouse gas emissions inventory, and projected future inventory based on the City’s expected population, household, and nonresidential growth.

Because portions of the project site are outside the General Plan “Planning Area,” because comprehensive planning has not been conducted for the project site, the Draft CAP does not account for the future development of the project site.

As stated in Section 2.2, state planning law provides that a city may comprehensively plan for lands outside of its jurisdiction. As stated above, the City would conduct comprehensive planning for the area at an unknown future date. Therefore, mitigation is proposed for the City of Elk Grove to prepare and evaluate a comprehensive plan for development of the project site that is consistent with the City’s proposed Climate Action Plan and greenhouse gas emission reduction goals prior to incorporation of land into the City. Implementation of Mitigation Measure GHG-1 would reduce this impact to less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

- MM GHG-1** Prior to annexation of any or part of the Sphere of Influence Amendment (SOIA) Area, the City of Elk Grove shall amend or augment the City’s greenhouse gas emissions inventory projections to account for development of the SOIA Area. Emission factors used by the City shall be submitted for review and concurrence to

**Greenhouse Gas Emissions**

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the SMAQMD and the ARB. The City shall assess the potential emission reductions from development of the SOIA Area consistent with the City’s Sustainability Element, Climate Action Plan; other applicable General Plan policies; and applicable city, county, and/or state programs that reduce greenhouse gases. The City shall demonstrate that future development of the SOIA Area would be consistent with AB 32, S-3-05, and SB 375 regional emission reduction targets, or other emission reduction targets adopted by the State of California or regional agencies in effect at the time of application for annexation.

**Level of Significance After Mitigation**

Less than significant impact.

**Greenhouse Gas Reduction Plans**

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

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**Impact Analysis**

The plan for reducing greenhouse gas emissions that is applicable to the project is ARB’s Scoping Plan. In addition, the City of Elk Grove is developing a General Plan Sustainability Element and Climate Action Plan.

*ARB’s Scoping Plan*

As discussed in the Regulatory Section, ARB adopted the Climate Change Scoping Plan (Scoping Plan), which outlines actions recommended to obtain that the emission reduction goals contained in AB 32. The Scoping Plan states, “The 2020 goal was established to be an aggressive, but achievable, mid-term target, and the 2050 greenhouse gas emissions reduction goal represents the level scientists believe is necessary to reach levels that will stabilize climate” (ARB 2008, page 4). The year 2020 goal of AB 32 corresponds with the mid-term target established by S-3-05, which aims to reduce California’s fair-share contribution of greenhouse gases in 2050 to levels that will stabilize the climate. The measures in the Scoping Plan are intended to be developed and in place by 2012.

The Scoping Plan identifies recommended measures for multiple greenhouse gas 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. Therefore, the majority of measures are not directly applicable or implementable at the project level. Furthermore, no land use changes or specific land use entitlements are proposed at this time.

*City of Elk Grove’s Draft Climate Action Plan*

As discussed above, the purpose of the CAP is to identify how the City will achieve greenhouse gas emission reduction target of 15 percent by the year 2020 and to create a path to obtain 2050 State targets associated with Governor’s Order S-03-05. The Draft CAP includes the City’s calculated



2005 greenhouse gas emissions inventory, and projected future inventory based on the City's expected population, household, and nonresidential growth.

Because portions of the project site are outside the General Plan "Planning Area," because comprehensive planning has not been conducted for the project site, the Draft CAP does not account for the future development of the project site.

As stated in Section 2.2, state planning law provides that a city may comprehensively plan for lands outside of its jurisdiction. Therefore, mitigation is proposed for the City of Elk Grove to amend or augment the Climate Action Plan to evaluate and reduce emissions from the comprehensive plan for development of the project site would be developed with mitigation measure GHG-1. Implementation of Mitigation Measure GHG-1 would reduce this impact to less than significant.

***Level of Significance Before Mitigation***

Potentially significant impact.

***Mitigation Measures***

Implement Mitigation Measure GHG-1.

***Level of Significance After Mitigation***

Less than significant impact.

