

4.1 AIR QUALITY AND CLIMATE CHANGE

4.1.1 Introduction

This section describes the project's impacts on air quality and the project's contribution to regional air quality conditions, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures required during implementation of the McKinley Village Project (proposed project). It also evaluates the project's impacts related to greenhouse gas (GHG) emissions and climate change. The climate change analysis provides an estimate of the project's GHG emissions and evaluates the project's consistency with the City's Climate Action Plan (CAP) based on the City's CAP Checklist.

Several comments were received in response to the Notice of Preparation (NOP) regarding air quality. All comments on this issue expressed concern of siting a residential project between a freeway and railroad tracks, where air quality has the potential to contain high-levels of toxins or particulate matter that can lead to negative health effects on residents. Commenters requested preparation of a Health Risk Assessment (HRA) and on-site monitoring of the project site to evaluate the potential health risks of the project. One comment also suggested greater setbacks to reduce harmful health risks resulting from proximity to the freeway and railroad tracks. Another comment raised concern about an increase in local air pollutant concentrations due to increased neighborhood traffic. Information regarding mitigation measures to protect the surrounding community from construction emissions, particulate matter, dust, and dirt spillover was also received. Additionally, one comment suggested the cumulative analysis should consider other projects in the area including the Mercy Hospital and Sutter General Hospital expansion as well as the proposed Sutter Memorial reuse project (Sutter Park project). All of the air quality and climate change concerns raised are addressed in this section. A copy of the NOP and letters received in response to it are included in Appendix A. A copy of the HRA prepared for the project is included in Appendix C. The air quality model outputs are included in Appendix B. The CAP Checklist is provided in Appendix G.

The information presented in this section is based on a site visit and review of project plans, the CalEEMod program to estimate project emissions, a health risk assessment addressing emissions from the freeway and railroad tracks (Appendix C), the City's 2030 General Plan (City of Sacramento 2009a) and Master EIR (MEIR) (City of Sacramento 2009b), and the Sacramento Metropolitan Air Quality Management District's (SMAQMD) Guide to Air Quality Assessment in Sacramento County (SMAQMD 2013).

4.1.2 Environmental Setting

Ambient air quality is generally affected by climatological conditions, the topography of the air basin, the type and amounts of pollutants emitted, and, for some pollutants, sunlight. The

project site is located the within Sacramento Valley Air Basin (SVAB). Topographical and climatic factors in the SVAB create the potential for high concentrations of regional and local air pollutants. This section describes relevant characteristics of the air basin, types of air pollutants, health effects, and existing air quality levels.

The SVAB includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and portions of Solano and Placer counties. The SVAB extends from south of Sacramento to north of Redding and is bounded on the west by the Coast Ranges and on the north and east by the Cascade Range and Sierra Nevada. The San Joaquin Valley Air Basin is located to the south.

Climate and Topography

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the valley. During the year the temperature may range from 20 to 115 degrees Fahrenheit (°F) with summer highs usually in the 90s and winter lows occasionally below freezing. The high average summer temperatures, combined with very low relative humidity, produces hot, dry summers that contribute to ozone buildup. Average annual rainfall is about 20 inches with snowfall being very rare. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

Weather patterns throughout the SVAB are affected by geography. Mountain ranges tend to buffer the basin from the marine weather systems that originate over the Pacific. However, the Carquinez Strait creates a breach in the Coast Range on the west of this basin, which exposes the midsection of the SVAB to marine weather. This marine influence moderates climatic extremes, such as the cooling that sea breezes provide in summer evenings. These breezes also help to move pollutants out of the valley. During about half of the days from July to September, however, a phenomenon called the “Schultz Eddy” prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern to circle back south. Essentially this phenomenon causes the air pollutants to be blown south toward the Sacramento area. This effect exacerbates the pollution levels in the area and increases the likelihood of violating federal or state standards. The effect normally dissipates around noon when the delta sea breeze arrives.

The mountains surrounding the valley can also contribute to elevated pollutant concentrations during periods of surface of elevated surface inversions. These inversions are most common in late summer and fall. Surface inversions are formed when the air close to the surface cools more rapidly than the warm layer of air above it. Elevated inversions occur when a layer of cool air is suspended between warm air layers above and below it. Both situations result in air stagnation. Air pollutants accumulate under and within inversions, subjecting people in the region to elevated pollution levels and associated health concerns. The surface concentrations

of pollutants are highest when these conditions are combined with smoke from agricultural burning or when temperature inversions trap cool air, fog, and pollutants near the ground.

Criteria Air Pollutants

Historically, air quality laws and regulations have divided air pollutants into two broad categories: criteria air pollutants and toxic air pollutants. Criteria air pollutants are a group of common air pollutants regulated by the federal and state governments by means of ambient standards based on criteria regarding health and/or the environmental effects of pollution and property damage. Toxic air contaminants (or hazardous air pollutants) are often referred to as “non-criteria” air pollutants because ambient air quality standards have not generally been established for them. Under certain conditions, toxic air contaminants may cause adverse health effects, including cancer and/or acute and chronic non-cancer effects. With the exception of diesel particulate matter from construction equipment and truck engines, substantial project-related emissions of other toxic air contaminants are not anticipated during implementation of the proposed project. Thus, toxic air contaminants other than diesel particulate matter are not discussed in the following paragraphs.

Under the Clean Air Act, the U.S. Environmental Protection Agency (U.S. EPA) has identified six criteria air pollutants that are both common and detrimental to human health. These criteria air pollutants are used as indicators of regional air quality. The six criteria air pollutants include: ozone (O₃), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). California identified four additional criteria air pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles.

The air pollutants pertinent to the analyses in this Draft EIR are O₃, CO, PM₁₀ and PM_{2.5}. As discussed below, O₃ is formed through reactions between reactive organic gases (ROGs) and nitrogen oxides (NO_x). There are no established criteria air standards for ROGs; rather they are regulated as O₃ precursors and are discussed below. A precursor is defined by the SMAQMD as “[a] pollutant that, when emitted into the atmosphere, may undergo either a chemical or physical change which then produces another pollutant for which an ambient air quality standard has been adopted” (SMAQMD 2012).

The following paragraphs describe the sources and health effects for the air pollutants of concern in the project region that would potentially be emitted during construction and operation associated with the proposed project. This information is based upon publications by the U.S. EPA (EPA 2012) and CARB (CARB 2013a).

Ozone (O₃)

O₃ is a strong smelling, pale blue, reactive toxic chemical gas consisting of three bonded oxygen atoms. O₃ is found in both the upper atmosphere from about 10 to 30 miles above the Earth’s

surface (stratosphere), as well as in the lower atmosphere up to about 10 miles above the Earth's surface (troposphere). Although O_3 is not directly emitted, in the lower atmosphere it forms through a photochemical reaction involving the Sun's energy and O_3 precursors, primarily NO_x and ROGs. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins. While O_3 in the upper atmosphere absorbs harmful ultraviolet light, ground-level ozone is damaging to the tissues of plants, animals, and humans. O_3 reacts chemically with internal body tissues, such as the lungs, and can cause adverse effects on the human respiratory system. Prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections.

Carbon Monoxide (CO)

CO is a colorless, odorless, poisonous gas, produced by incomplete burning of carbon-based fuels, including gasoline, oil, and wood. CO is also produced from incomplete combustion of many natural and synthetic products. CO as a byproduct of motor vehicle exhaust contributes to more than two-thirds of all CO emissions nationwide. When CO gets into the body, it combines with chemicals in the blood and prevents the blood from providing oxygen to cells, tissues, and organs. Because the body requires oxygen for energy, high-level exposure to CO can cause serious health effects. At high concentrations, CO can cause heart difficulties in people with chronic diseases, and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and death.

Nitrogen Dioxide (NO₂)

A brownish gas, NO_2 is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates. Most NO_2 , like O_3 , is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_x and are major contributors to O_3 formation. NO_x is emitted from combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. NO_2 is a primary precursor to the formation of ground-level O_3 , and reacts in the atmosphere to form acid rain. NO_2 is a respiratory irritant, can cause lung damage, and may affect those with existing respiratory illness, including asthma. Airborne NO_2 can also impair visibility through the formation of smog.

Particulate Matter (PM₁₀ and PM_{2.5})

Particulate matter pollution consists of small particles including dust, soot, smoke, and other tiny bits of solid materials that are released into and move around in the air. PM_{10} and $PM_{2.5}$ are emitted from stationary and mobile sources, including diesel trucks and other motor vehicles,

power plants, industrial processing, wood burning stoves and fireplaces, wildfires, dust from roads, construction, landfills, and agriculture, and fugitive windblown dust. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. PM₁₀ refers to particles less than or equal to 10 microns in aerodynamic diameter. PM_{2.5} refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset, or portion of PM₁₀. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. PM₁₀ and PM_{2.5} can aggravate respiratory disease, and cause lung damage, cancer, and premature death.

Reactive Organic Gases

Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. Hydrocarbons that contribute to formation of O₃ are referred to as ROGs (also referred to as volatile organic compounds (VOCs)). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of hydrocarbons result from the formation of ozone and its related health effects. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered toxic air contaminants. There are no separate health standards for ROGs.

Existing Air Quality

Under both the federal and state Clean Air Acts, standards identifying the maximum allowable concentration of the criteria air pollutants have been adopted. The U.S. EPA and the California Air Resources Board (CARB) use air quality monitoring data to determine if each air basin or county is in compliance with the applicable standards. If the concentration of a criteria air pollutant is lower than the standard or not monitored in an area, the area is classified as attainment or unclassified (and unclassified areas are treated as attainment areas). If an area exceeds the standard, the area is classified as nonattainment for that pollutant.

The U.S. EPA has designated Sacramento County as a nonattainment area for the federal 8-hour ozone standard, and CARB has designated the County as a nonattainment area for the state 1-hour and 8-hour ozone standards. The County has been designated as a nonattainment area for the federal and state 24-hour and state annual PM₁₀ standards. The County is designated as a nonattainment area for the 2006 federal 24-hour PM_{2.5} standard and as a nonattainment area for the state annual PM_{2.5} standard. The air basin is designated as unclassified or attainment for all other criteria air pollutants. The status of the air basin with respect to the National Ambient Air Quality Standards (NAAQS) is summarized in Table 4.1-1, NAAQS and Status – Sacramento

Valley Air Basin (Sacramento County), and the status of the air basin with respect to the California Ambient Air Quality Standards (CAAQS) is summarized in Table 4.1-2, CAAQS and Status – Sacramento Valley Air Basin (Sacramento County).

**Table 4.1-1
NAAQS and Status
Sacramento Valley Air Basin (Sacramento County)**

Pollutant	Averaging Time	Designation/Classification
Ozone (O ₃)	8 hours	Nonattainment/Severe-15
Nitrogen dioxide (NO ₂)	1 hour, annual arithmetic mean	Unclassifiable/Attainment
Carbon monoxide (CO) ¹	1 hour, 8 hours	Attainment/Maintenance (North) Unclassifiable/Attainment (South)
Sulfur dioxide (SO ₂)	24 hours, annual arithmetic mean	Unclassifiable
Respirable particulate matter (PM ₁₀)	24 hours	Nonattainment/Moderate
Fine particulate matter (PM _{2.5})	24 hours, annual arithmetic mean 24 hours	Unclassifiable/Attainment (1997 NAAQS) Attainment/Maintenance (2006 NAAQS)
Lead (Pb)	Rolling 3-month average	Unclassifiable/Attainment

Source: EPA 2013a.

Note:

¹ The northern (urbanized) portion of Sacramento County is designated as Attainment/Maintenance, while the southern (rural) portion of the County is designated as Unclassifiable/Attainment.

**Table 4.1-2
CAAQS and Status
Sacramento Valley Air Basin (Sacramento County)**

Pollutant	Averaging Time	Designation/Classification
Ozone (O ₃)	1 hour, 8 hours	Nonattainment ¹
Nitrogen dioxide (NO ₂)	1 hour, Annual	Attainment
Carbon monoxide (CO)	1 hour, 8 hours	Attainment
Sulfur dioxide (SO ₂)	1 hour, 24 hours	Attainment
Respirable particulate matter (PM ₁₀)	24 hours, annual arithmetic mean	Nonattainment
Fine particulate matter (PM _{2.5})	Annual arithmetic mean	Nonattainment
Lead (Pb) ²	30-day average	Attainment
Sulfates (SO ₄)	24 hours	Attainment
Hydrogen sulfide (H ₂ S)	1 hour	Unclassified

**Table 4.1-2
CAAQS and Status
Sacramento Valley Air Basin (Sacramento County)**

Pollutant	Averaging Time	Designation/Classification
Vinyl chloride ²	24 hours	Unclassified
Visibility-reducing particles	8 hours (10:00 a.m.–6:00 p.m.)	Unclassified

Source: CARB 2013c.

Notes:

¹ CARB has not issued area classification based on the state 8-hour standard. The previous classification for the 1-hour O₃ standard was Serious.

² CARB has identified lead, vinyl chloride, and toxic air contaminants with no threshold level of exposure for adverse health effects determined.

The SMAQMD maintains ambient air quality monitoring stations throughout Sacramento County. All air pollutants are not monitored at each station; thus, data from the closest representative station that monitors a specific pollutant are summarized. The ambient air quality monitoring stations nearest the project site are the Sacramento T Street station, which monitors for O₃, and NO₂; the Sacramento El Camino and Watt station, which monitors CO; and the Sacramento Health Department on Stockton Boulevard station, which monitors PM₁₀ and PM_{2.5}. In addition to the data for these stations, the maximum values for O₃, PM₁₀, and PM_{2.5}—the pollutants of most importance in the Sacramento region—at any monitoring station in Sacramento County are also reported to further characterize air quality in the County. The most recent background ambient air quality data from 2008 to 2012 are presented in Table 4.1-3. The number of days exceeding the O₃ and PM₁₀ ambient air quality standards at the corresponding monitoring stations is shown in Table 4.1-4, Frequency of Air Quality Standard Violations.

**Table 4.1-3
Peak Background Concentrations in the Study Area for the Period of 2008-2012**

	Monitoring Station	Ambient Air Quality Standard	2008	2009	2010	2011	2012
<i>Ozone</i>							
Maximum 1-hour concentration	Sacramento-T Street	0.09 ppm	0.107	0.102	0.092	0.100	0.104
Maximum 8-hour concentration		0.070 ppm (state)	0.092	0.089	0.074	0.087	0.093
		0.075 ppm (federal)	0.092	0.088	0.074	0.087	0.092
<i>Nitrogen Dioxide</i>							
Maximum 1-hour concentration	Sacramento-T Street	0.18 ppm (state) 0.100 ppm (federal)	0.065	0.068	.066	0.057	0.055

**Table 4.1-3
Peak Background Concentrations in the Study Area for the Period of 2008-2012**

	Monitoring Station	Ambient Air Quality Standard	2008	2009	2010	2011	2012
Annual concentration		0.030 ppm (state) 0.053 ppm (federal)	0.015	0.013	0.013	0.013	ND
<i>Carbon Monoxide</i>							
Maximum 1-hour concentration	Sacramento-El Camino and Watt	20 ppm (state) 35 ppm (federal)	3.3	3.3	2.3	3	2.7
Maximum 8-hour concentration		9.0 ppm (state)	2.84	2.84	1.89	2.83	2.14
		9 ppm (federal)	2.84	2.84	1.89	2.83	2.14
<i>Respirable Particulate Matter (PM₁₀)</i>							
Maximum 24-hour conc. (state method)	Sacramento-Health Dept. Stockton Blvd.	50 µg/m ³	88.0	48.0	46.0	63.0	34.0
Maximum 24-hour conc. (federal method)		150 µg/m ³	92.4	45.0	50.0	73.5	37.2
Annual concentration (state method)		20 µg/m ³	23.9	18.6	15.8	18.1	16.5
<i>Fine Particulate Matter (PM_{2.5})</i>							
Maximum 24-hour conc. (federal method)	Sacramento-Health Dept. Stockton Blvd.	35 µg/m ³	64.8	42.4	29.0	50.7	29.0
Annual concentration (state method)		12 µg/m ³	64.8	42.4	29.0	50.7	29.0
Annual concentration (federal method)		15.0 µg/m ³	12.1	9.5	7.8	10.0	8.2

Sources: CARB 2013d; EPA 2013b.

Notes:

ppm = parts per million

µg/m³ = micrograms per cubic meter

NA – data are not available from the listed sources

ND – insufficient data available to determine the value

**Table 4.1-4
Frequency of Air Quality Standard Violations**

Monitoring Site	Year	Number of Days Exceeding Standard			
		State 1-Hour O ₃	State 8-Hour O ₃	Federal 8-Hour O ₃	State 24-Hour PM ₁₀ ¹
Sacramento- T Street	2008	7	18	9	No data for 24-hour PM ₁₀ is available at this monitoring site
	2009	3	13	4	
	2010	0	1	0	
	2011	1	5	1	
	2012	1	9	4	
Sacramento-Health Dept. Stockton Blvd. ²	2008	No data for hourly O ₃ is available at this monitoring site.			13.0
	2009				0.0
	2010				0.0
	2011				6.1
	2012				0.0

Source: CARB 2013d.

Notes:

¹ Measurements of PM₁₀ are usually collected every 6 days. "Number of days exceeding the standards" are mathematical estimates of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

² Sacramento County Monitoring Station is the highest recording within Sacramento County from various stations.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. The SMAQMD identifies a sensitive receptor as "facilities that house or attract children, the elderly, and people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors" (SMAQMD 2013). Recreational uses may also be considered sensitive due to the greater exposure to ambient air quality conditions because people engaging in vigorous exercise have higher breathing rates.

The land surrounding the project site is primarily residential, light industrial, office, transportation facilities, and open space/recreational. The nearest residential sensitive receptors are located 150 feet south of the western portion of project site and 300 feet east of the eastern project boundary. The closest school is Theodore Judah Elementary School, which is located approximately 2,230 feet (0.5 of a mile) south of the project site on McKinley Boulevard. The nearest medical facility to the project site is Mercy General Hospital located 4,230 feet (0.75 mile) south of the project site on J Street.

Climate Change

The Earth's climate has undergone many changes during its history, ranging from ice ages to long periods of warmth. Natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy from the Sun have affected global temperatures and thus the Earth's climate. "Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer)" (EPA 2013c). The term "climate change" is often used interchangeably with the term "global warming"; however, "climate change" is preferred as it helps convey that there are other changes in addition to rising temperatures.

The Greenhouse Effect and Greenhouse Gases

Heat retention within the atmosphere is an essential process to sustain life on Earth. The natural process through which heat is retained in the troposphere¹ is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a threefold process: short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and toward the Earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. This natural process contributes to regulating the Earth's temperature, without which the temperature of the Earth would be about 0°F (-18° Celsius (C)) instead of its present 57°F (14°C) (NCDC 2012).

Gases that trap heat in the atmosphere are often called "greenhouse gases." Principal GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), O₃, and water vapor. Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Emissions of CO₂ are largely byproducts of fossil-fuel combustion, whereas CH₄ results mostly from off-gassing associated with agricultural practices and landfills. Man-made GHGs, which are associated with certain industrial products and processes, have a much greater heat-absorption potential than CO₂. They include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). The major GHGs emitted by human activities remain in the atmosphere for periods ranging from decades to centuries; therefore, it is virtually certain that atmospheric concentrations of GHGs will continue to rise over the next few decades (EPA 2011).

It is generally agreed that human activity has been increasing the concentration of GHGs in the atmosphere (mostly CO₂ from combustion of coal, oil, and gas, and a few other trace gases)

¹ The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

(NCDC 2012). The global atmospheric concentration of CO₂ has increased from a pre-industrial value of about 280 to 379 parts per million (ppm) in 2005 (IPCC 2007). A warming trend of approximately 1.0°F to 1.7°F occurred during the twentieth century; warming occurred in both the northern and southern hemispheres and over the oceans (IPCC 2007). Most warming in recent decades is very likely the result of human activities (IPCC 2007).

The effect each GHG has on climate change is measured as a combination of the volume or mass of its emissions, plus the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP). The GWP varies between GHGs; for example, the GWP of CH₄ is 21, and the GWP of N₂O is 310. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO₂. Thus, GHG emissions are typically measured in terms of pounds or tons of “carbon dioxide equivalent” (CO₂E).²

Contributions to Greenhouse Gas Emissions

In 2011, the United States produced 6,702 million metric tons of CO₂E (MMT CO₂E) (EPA 2013d). The primary GHG emitted by human activities in the United States was CO₂, representing approximately 84% of total GHG emissions. The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 94% of the CO₂ emissions and 79% of overall GHG emissions.

According to the 2010 GHG inventory data compiled by CARB for the California Greenhouse Gas Inventory for 2000–2010, California emitted 452 MT CO₂E of GHGs, including emissions resulting from out-of-state electrical generation (CARB 2013e). The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. These primary contributors to California’s GHG emissions and their relative contributions in 2010 are presented in Table 4.1-5.

**Table 4.1-5
GHG Sources in California**

Source Category	Annual GHG Emissions (MMT CO₂E)	% of Total
Agriculture	32.45	7.19%
Commercial and residential	43.89	9.72%
Electricity generation	93.30 ¹	20.66%
Forestry (excluding sinks)	0.19	0.04%

² The CO₂ equivalent for a gas is derived by multiplying the mass of the gas by the associated GWP, such that MT CO₂E = (metric tons of a GHG) x (GWP of the GHG). For example, the GWP for CH₄ is 21. This means that emissions of 1 metric ton of methane are equivalent to emissions of 21 metric tons of CO₂.

**Table 4.1-5
GHG Sources in California**

Source Category	Annual GHG Emissions (MMT CO₂E)	% of Total
Industrial uses	85.96	19.03%
Recycling and waste	6.98	1.55%
Transportation	173.18	38.35%
High-GWP substances	15.66	3.47%
Totals	451.60	100.00%

Source: CARB 2013.

Note:

¹ Includes emissions associated with imported electricity, which account for 43.59 MMT CO₂E annually.

Potential Effects of Human Activity on Climate Change

Globally, climate change has the potential to impact numerous environmental resources though uncertain impacts related to future air temperatures and precipitation patterns. The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2°C per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place, including substantial ice loss in the Arctic (IPCC 2007).

According to CARB, some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high O₃ days, more large forest fires, and more drought years (CARB 2006). Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists' understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. Climate change is already affecting California: average temperatures have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010). These

climate-driven changes affect resources critical to the health and prosperity of California. Climate change modeling using emission rates from the year 2000 shows that further warming would occur, which would induce further changes in the global climate system during the current century. Changes to the global climate system and ecosystems and to California would include, but would not be limited to, the following:

- The loss of sea ice and mountain snowpack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures (IPCC 2007)
- A rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps and the Greenland and Antarctic ice sheets (IPCC 2007)
- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and intensity of tropical cyclones (IPCC 2007)
- A decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California, by 30% to as much as 90% over the next 100 years (CAT 2006)
- An increase in the number of days conducive to O₃ formation by 25% to 85% (depending on the future temperature scenario) in high-O₃ areas of Los Angeles and the San Joaquin Valley by the end of the twenty-first century (CAT 2006).

4.1.3 Regulatory Background

Federal Regulations

Clean Air Act

The federal Clean Air Act (CAA) was enacted for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. The U.S. EPA is responsible for implementing most aspects of the CAA, including the setting of NAAQS for major air pollutants, hazardous air pollutant standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions. In 1971 the U.S. EPA developed primary and secondary NAAQS. Six pollutants of primary concern were designated: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM₁₀), particulate matter less than or equal to 2.5 microns in aerodynamic diameter (PM_{2.5}), and lead (Pb). The primary NAAQS must "protect the public health with an adequate margin of safety" and the secondary standards must "protect the public welfare from known or anticipated adverse effects (aesthetics, crops, architecture, etc.)." The primary standards were established, with a margin of

safety, considering long-term exposures of the most sensitive groups in the general population. The U.S. EPA allows states the option to develop different (stricter) standards. California elected this option and adopted standards that are more stringent. The task of air quality management and regulation has been legislatively granted to the CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels.

If an air basin is not in federal attainment (e.g., does not meet federal standards) for a particular pollutant, the basin is classified as a marginal, moderate, serious, severe, or extreme nonattainment area. Nonattainment areas must take steps towards attainment by a specific timeline. These steps include establishing a transportation control program and clean-fuel vehicle program, decreasing the emissions threshold for new stationary sources and for major sources, and increasing the stationary source emission offset ratio to at least 1.3:1. The above programs are published in the State Implementation Plan (SIP), which is approved by the U.S. EPA.

The SIP is a number of documents that set forth the state's strategies for achieving federal air quality standards. The Code of Federal Regulations (CFR Title 40, Chapter I, Part 52, Subpart F, Section 52.220) lists all of the items that are included in the California SIP. The SIP is not a single document, but a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. Many of California's SIPs detail control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. State law makes CARB the lead agency for all purposes related to the SIP.

While the CAA does not call specifically for regulation of GHGs, in *Massachusetts v. EPA*, 549 U.S. 497, the Supreme Court found that GHGs are air pollutants covered by the CAA.

Hazardous Air Pollutants

EPA identifies and regulates Hazardous Air Pollutants (HAPs) under Title III of the CAA, as amended in 1990, which directed EPA to issue national emissions standards for HAPs (NESHAP). The NESHAP may be different for major sources than for area sources of HAPs. Major sources are defined as stationary sources with the potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. There are two types of emissions standards – standards that require application of Maximum Achievable Control Technology (MACT) and health-risk based standards deemed necessary to address risks remaining after

implementation of the MACT. For area sources, the MACT standards may be different, based on generally available control technology.

The CAA also requires EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum for benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 requires the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

Other Federal Regulations

Two other federal regulations would have the effect of reducing national GHG emissions, but do not directly influence the environmental impact analysis for the proposed project. These are the Energy Independence and Security Act of 2007, and the U.S. EPA, in conjunction with the National Highway Traffic Safety Administration (NHTSA), Joint Final Rules for Vehicle Standards. The Energy Independence Act sets a mandatory Renewable Fuel Standard (RFS), sets a target of 35 miles per gallon (mpg) for cars and light trucks by model year 2020, and sets standards related to energy efficiency and energy conservation for heating and cooling products, consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances. The Joint Final Rules for Vehicle Standards set increasing Corporate Average Fuel Economy (CAFE) standards for new passenger cars and light-trucks as well as for combination tractors (i.e., semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles including transit and school buses. The regulations also include targeted incentives to encourage early adoption and introduction into the marketplace of advanced technologies to dramatically improve vehicle performance such as electric, hybrid, and natural gas vehicles.

State Regulations

Ambient Air Quality Standards

CARB, a part of the California Environmental Protection Agency (Cal/EPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets state ambient air quality standards, compiles emission inventories, develops suggested control measures, provides oversight of local programs, and responds to the federal CAA. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. As discussed above, CARB also has primary responsibility for the development of California's SIP, for which it works closely with the Air Quality Management Districts (AQMDs) and the U.S. EPA.

CARB has established CAAQS, which are generally more restrictive than the NAAQS, consistent with the federal CAA, which requires state regulations to be at least as restrictive as the federal requirements. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. The CAAQS for O₃, CO, SO₂ (1-hour and 24 hours), NO₂, PM₁₀, and PM_{2.5} and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The CAAQS are presented in Table 4.1-6.

**Table 4.1-6
Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards ¹	National Standards ²	
		Concentration ³	Primary ^{3,4}	Secondary ^{3,5}
O ₃	1 hour	0.09 ppm (180 µg/m ³)	—	Same as Primary Standard
	8 hours	0.070 ppm (137 µg/m ³)	0.075 ppm (147 µg/m ³)	
NO ₂	1 hour	0.18 ppm (339 µg/m ³)	0.100 ppm (188 µg/m ³)	Same as Primary Standard
	Annual arithmetic mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)	
CO	1 hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	None
	8 hours	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
SO ₂	1 hour	0.25 ppm (655 µg/m ³)	0.075 ppm (196 µg/m ³)	—
	3 hours	—	—	0.5 ppm (1300 µg/m ³)
	24 hours	0.04 ppm (105 µg/m ³)	0.14 ppm (for certain areas)	—
	Annual arithmetic mean	—	0.030 ppm (for certain areas)	—
PM ₁₀	24 hours	50 µg/m ³	150 µg/m ³	Same as Primary Standard
	Annual arithmetic mean	20 µg/m ³	—	
PM _{2.5}	24 hours	—	35 µg/m ³	Same as Primary Standard
	Annual arithmetic mean ⁶	12 µg/m ³	12.0 µg/m ³	15.0 µg/m ³

**Table 4.1-6
Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards ¹	National Standards ²	
		Concentration ³	Primary ^{3,4}	Secondary ^{3,5}
Lead ⁷	30-day average	1.5 µg/m ³	—	
	Calendar quarter	—	1.5 µg/m ³ (for certain areas)	Same as Primary Standard
	Rolling 3-month average	—	0.15 µg/m ³	
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m ³)	—	—
Vinyl chloride	24 hours	0.01 ppm (26 µg/m ³)	—	—
Sulfates	24 hours	25 µg/m ³	—	—
Visibility-reducing particles	8-hour (10:00 a.m. to 6:00 p.m. PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	—	—

Source: CARB 2013b.

ppm = parts per million by volume.

µg/m³ = micrograms per cubic meter.

mg/m³ = milligrams per cubic meter.

Notes

¹ California standards for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, suspended particulate matter (PM₁₀, PM_{2.5}), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the standards in Section 70200 of Title 17 of the California Code of Regulations.

² National standards (other than O₃, NO₂, SO₂, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O₃ standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For NO₂ and SO₂, the standard is attained when the 3-year average of the 98th and 99th percentiles, respectively, of the daily maximum 1-hour average at each monitor within an area does not exceed the standard (effective April 12, 2010). For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 micrograms per cubic meter (µg/m³) is equal to or less than 1. For PM_{2.5}, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

³ Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm (parts per million) in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

⁴ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

- ⁵ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- ⁶ On December 14, 2012, the EPA Administrator signed the notice of final rule revising the annual PM_{2.5} standard from 15.0 to 12.0 $\mu\text{g}/\text{m}^3$. The final rule has not been published in the Federal Register as of the date of this report, and an effective date for the ruling has not been set.
- ⁷ CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

CARB Regulations for Mobile Sources

The following CARB regulations will be applicable to mobile sources associated with implementation of the proposed project.

Idling of Commercial Heavy Duty Trucks (13 CCR 2485): This Airborne Toxic Control Measure (ATCM) was adopted to control emissions from idling trucks. It prohibits idling for more than 5 minutes for all commercial trucks with a gross vehicle weight rating over 10,000 pounds. The ATCM contains an exception that allows trucks to idle while queuing or involved in operational activities.

In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.): This ATCM requires that specific fleet average requirements are met for criteria air pollutant emissions, particularly NO_x and particulate matter, from in-use off-road diesel-fueled vehicles. Where average requirements cannot be met, Best Available Control Technology requirements apply.

In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025): This ATCM was adopted to reduce NO_x and particulate matter emissions from most in-use on-road diesel trucks and buses with a gross vehicle weight rating greater than 14,000 pounds and requires use of exhaust retrofit equipment and replacement of older vehicles.

Clean Car Standards: As required under AB 1493 (Pavley 2002) and as authorized by the granting of a waiver from the federal CAA, CARB established GHG emission standards for passenger vehicles, light-duty trucks, and other personal vehicles. These standards apply to all new passenger vehicles starting with the 2009 model year.

California Clean Air Act

The California Clean Air Act (CCAA) of 1988 requires nonattainment areas to achieve and maintain the state ambient air quality standards by the earliest practicable date and local air districts to develop plans for attaining the state ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide standards. In compliance with the CCAA, the SMAQMD prepared and submitted the 1991 Air Quality Attainment Plan (AQAP) to address mainly Sacramento County's nonattainment status for ozone and carbon monoxide, and although not required, PM10. The CCAA also requires districts to assess their progress toward attaining the air quality standards every 3 years. The triennial assessment is to report the extent of air quality improvement and

the amounts of emission reductions achieved from control measures for the preceding 3-year period. CARB is responsible for ensuring implementation of the CCAA.

Executive Order S-3-05

In June 2005, Governor Arnold Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80% below 1990 levels by 2050. The Secretary of Cal/EPA is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Representatives from several state agencies comprise the Climate Action Team, which is responsible for implementing global warming emissions reduction programs and the state's Climate Adaptation Strategy. The Climate Action Team must regularly report to the governor and the legislature. There are several working groups within the Climate Action Team, including groups focused on agriculture, biodiversity, forestry, land use and infrastructure, public health, research, and water energy.

Assembly Bill 32

In furtherance of the goals established in Executive Order S-3-05, the legislature enacted Assembly Bill 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions Act of 2006. This bill established the target for 2020 set by the executive order—reducing GHG emissions to the 1990 levels—as a regulatory requirement. In addition, AB 32 assigned CARB the responsibility of carrying out and developing the programs and requirements necessary to achieve the goals of AB 32.

Specifically, CARB is required to adopt regulations requiring the reporting and verification of statewide GHG emissions and to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any adopted rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism.

As required by AB 32, CARB adopted the following nine “discrete early action GHG reduction measures:”

1. A low-carbon fuel standard to reduce the “carbon intensity” of California fuels.
2. Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of “do-it-yourself” automotive refrigerants.

3. Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.
4. Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology.
5. Reduction of auxiliary engine emissions of docked ships by requiring port electrification.
6. Reduction of PFCs from the semiconductor industry.
7. Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products).
8. Requirement that all tune-up, smog check, and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency.
9. Restriction on the use of SF6 from non-electricity sectors if viable alternatives are available.

Additionally, AB 32 required CARB to approve an inventory of GHG emissions generated in 1990, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT CO₂E. In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of GHGs for large facilities that account for 94% of GHG emissions from industrial and commercial stationary sources in California. About 800 separate sources fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit CO₂ in excess of specified thresholds.

In December 2008, CARB approved the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include (CARB 2008):

- Expanding and strengthening existing energy efficiency programs, and building and appliance standards.
- Achieving a statewide renewables energy mix of 33%.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.

- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

Executive Order S-1-07

Issued on January 18, 2007, Executive Order S-1-07 sets a declining Low Carbon Fuel Standard (LCFS) for GHG emissions measured in CO₂-equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources such as algae, wood, and agricultural waste. In addition, the LCFS would drive the availability of plug-in hybrid, battery electric, and fuel-cell-power motor vehicles. The LCFS is anticipated to replace 20% of the fuel used in motor vehicles with alternative fuels by 2020.

Senate Bill 375

SB 375 (Steinberg) was passed by the legislature in August 2008 and signed by Governor Arnold Schwarzenegger on September 30, 2008. SB 375 addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. As required under this law, CARB has assigned regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035.

Regional metropolitan planning organizations (MPOs) are responsible for preparing a Sustainable Communities Strategy (SCS) within the Regional Transportation Plan. The goal of the SCS is to establish a development plan for the region, which, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets.

SB 375 allows for streamline California Environmental Quality Act (CEQA) requirements for "transit priority projects," as specified in SB 375, and limiting the analysis of the impacts of certain residential and mixed-use projects on GHG emissions, regional traffic impacts, and growth inducement of those projects when the projects are consistent with the SCS. The Sacramento Area Council of Governments (SACOG) has determined that the proposed project is a qualifying residential project consistent with the SCS (see Appendix N). Since the project

was determined by SACOG to be consistent with the SCS, the EIR “shall not be 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.” (Public Resources Code Section 21159.28(a).)

However, for the purposes of full public disclosure this EIR includes an evaluation of the proposed project’s contribution to GHG emissions from cars and light-duty truck trips.

On September 23, 2010, CARB adopted the SB 375 targets for the regional MPOs. The targets for SACOG are a 7% reduction in emissions per capita by 2020 and a 16% reduction by 2035. See additional discussion of the SACOG plan under Local Regulations.

Executive Order S-13-08

Governor Arnold Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The Executive Order is intended to hasten California’s response to the impacts of global climate change, particularly sea level rise. It directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report, directing the Business, Transportation, and Housing Agency to assess the vulnerability of the state’s transportation systems to sea level rise, and requiring the Office of Planning and Research and the Natural Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The order also required state agencies to develop adaptation strategies, to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the state for the following areas: public health, ocean and coastal resources, water supply and flood protection, agriculture, forestry, biodiversity and habitat, and transportation and energy infrastructure. The report then recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Senate Bill X1 2

SB X1 2 expands the Renewable Portfolio Standard by establishing a goal of 20% of the total electricity sold to retail customers in California per year, by December 31, 2013, and 33% by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location. In addition to the retail sellers covered by SB 107, SB X1 2 adds local publicly owned electric utilities to the Renewable Portfolio Standard. The California Public Utilities Commission (CPUC) has established the quantity of

electricity products from eligible renewable energy resources to be procured by retail sellers in order to achieve targets of 20% by December 31, 2013; 25% by December 31, 2016; and 33% by December 31, 2020. The statute also requires that the governing boards for local publicly owned electric utilities establish the same targets, and the governing boards are responsible for ensuring compliance with these targets. The CPUC is responsible for enforcement of the Renewable Portfolio Standard for retail sellers, while the California Energy Commission and CARB will enforce the requirements for local publicly owned electric utilities.

Air Toxics Hot Spots Information and Assessment Act of 1987

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588), California Health and Safety Code Section 44300 et seq., provides for the regulation of over 200 TACs, including diesel particulate matter, and is the primary air contaminant legislation in California. Under the act, local air districts may request that a facility account for its TAC emissions. Local air districts then prioritize facilities on the basis of emissions, and high priority designated facilities are required to submit a health risk assessment and communicate the results to the affected public.

Assembly Bill 1807

Assembly Bill 1807 (AB 1807), enacted in September 1983, sets forth a procedure for the identification and control of TACs in California. CARB is responsible for the identification and control of TACs, except pesticide use.

Senate Bill 656

SB 656, Particulate Matter Control Measure Implementation Schedule, was enacted in 2003 and codified as Health and Safety Code Section 39614. SB 656 seeks to reduce exposure to PM₁₀ and PM_{2.5} and to make further progress toward attainment of the NAAQS and CAAQS for PM₁₀ and PM_{2.5}. SB 656 required CARB, in consultation with local air districts, to develop and adopt lists of “the most readily available, feasible, and cost-effective” particulate matter control measures. Subsequently, the air districts were required to adopt implementation schedules for the relevant control measures in their district. The SMAQMD adopted its SB 656 particulate matter control measure implementation schedule on July 28, 2005.

Air Quality and Land Use Handbook

CARB’s Air Quality and Land Use Handbook: A Community Health Perspective (CARB Handbook, CARB 2005) addresses the importance of considering health risk issues when siting sensitive land uses, including residential development, in the vicinity of intensive air pollutant emission sources including freeways or high-traffic roads, distribution centers, ports, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities. The CARB Handbook draws upon studies evaluating the health effects

of traffic traveling on major interstate highways in metropolitan California centers within Los Angeles (Interstate (I) 405 and I-710), and the San Francisco Bay, and San Diego areas. The recommendations identified by CARB, including siting residential uses no closer than 500 feet from freeways or other high-traffic roadways, are consistent with those adopted by the State of California for location of new schools. Specifically, the CARB Handbook recommends, “Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day” (CARB 2005).

Importantly, the CARB Handbook Introduction clarifies these guidelines are strictly advisory recognizing that: “[I]and use decisions are a local government responsibility. The Air Resources Board Handbook is advisory and these recommendations do not establish regulatory standards of any kind.” Also, CARB recognizes that there may be land use objectives as well as meteorological and other site specific conditions that need to be considered by a governmental jurisdiction relative to the general recommended setbacks, specifically stating, “[t]hese recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues” (CARB 2005).

Local

SACOG Sustainable Communities Strategy

In April 2012, SACOG, the designated MPO for the Sacramento region, adopted a Metropolitan Transportation Plan/Sustainable Communities Strategy for 2035 (MTP/SCS) (SACOG 2012). Building on prior plans including the Blueprint Growth Strategy discussed below and the 2008 MTP, the SCS accommodates future growth through a more compact land use pattern largely within the region’s current development footprint, emphasizes operational improvements over new roadway capacity projects, and reflects other factors that have tended to reduce motor vehicle use. The SCS demonstrates that, if implemented, the region will achieve a 9% per capita GHG reduction in passenger vehicle emissions in 2020 and a 16% reduction in 2035. These reductions meet the targets for SACOG of 7% and 16% per capita GHG reduction from 2005 for the years 2020 and 2035, respectively, established by CARB. In June 2012, CARB issued an Acceptance of GHG Quantification Determination for the SACOG SCS, indicating that CARB concurs with SACOG’s quantification of GHG emission reductions from the final MTP/SCS and its determination that the SCS would achieve the 2020 and 2035 targets established by CARB. As noted previously, SACOG has determined the project is consistent with the SCS (see Appendix N).

Sacramento Region Blueprint

In 2007 SACOG adopted the Preferred Blueprint Scenario for 2050 (Blueprint). The Blueprint depicts a way for the region to grow through 2050 in a manner consistent with the seven smart growth principals: (1) transportation choices; (2) mixed-use developments; (3) compact development; (4) housing choice and diversity; (5) use of existing assets; (6) quality design, and (7) natural resources conservation. The seven smart growth principals provide guidance for land use planners which, when implemented, would ultimately result in an overall reduction in vehicle miles traveled (VMT), emissions of criteria pollutants, and GHG emissions.

Sacramento Metropolitan Air Quality Management District

The SMAQMD is the primary agency responsible for planning to meet federal and state ambient air quality standards in Sacramento County and the larger Sacramento Ozone Nonattainment Area.

The SMAQMD operates monitoring stations in Sacramento County, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The SMAQMD's air quality management plans include control measures and strategies to be implemented to attain state and federal ambient air quality standards in Sacramento County. The SMAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

Applicable SMAQMD attainment plans include:

- 8-Hour Ozone Attainment and Reasonable Further Progress Plan and Revised 8-Hour Ozone Attainment and Reasonable Further Progress Plan: The 2009 8-Hour Ozone Attainment and Reasonable Further Program Plan describes measures to be implemented by the air districts in the Sacramento Federal Nonattainment Area (SFNA) to achieve the 1997 ozone NAAQS. This plan includes the information and analyses to fulfill the federal CAA requirements for demonstrating reasonable further progress and attainment of the 1997 8-hour ozone NAAQS for the Sacramento region. In addition, this plan establishes an updated emissions inventory projected for a 2019 attainment date, provides photochemical modeling results, proposes the implementation of reasonably available control measures, and sets new motor vehicle emission budgets for transportation conformity purposes for the reasonable further progress milestone years and the 2018 attainment year. The emission reduction strategy is based on reductions in both ROG and NO_x emissions. Future control measures include state and federal control strategies (e.g., smog check program improvements and cleaner heavy-duty trucks and off-road equipment), local mobile source incentive programs, SACOG transportation control measures, a measure to reduce biogenic VOCs from Sacramento's urban forest,

indirect source rules related to construction and operation of development projects, and new and more stringent stationary source control rules (SMAQMD 2011a).

In 2011, the air districts comprising the SFNA reviewed the 2009 Ozone Attainment Plan and concluded that certain stationary source control measures and transportation control measures would not be adopted or implemented within the time frames outlined in the plan. The air districts submitted a revision to CARB and U.S. EPA. For the SMAQMD, the revision resulted in removal of two stationary source control measures (stationary internal combustion engines at major stationary sources and asphaltic concrete) and two indirect source review rule measures commitments, substitution of one transportation control measure (TCM) and rescheduling several stationary source measures and TCMs.

- PM₁₀ Implementation/Maintenance Plan and Redesignation Request for Sacramento County: On October 28, 2010, the SMAQMD Governing Board approved the PM₁₀ maintenance plan and request for redesignation for the 1997 PM₁₀ NAAQS (SMAQMD 2010a). In 2002, the U.S. EPA officially determined that Sacramento County had attained the PM₁₀ NAAQS by the December 31, 2000, attainment deadline. This plan fulfills the requirements for the U.S. EPA to redesignate Sacramento County from nonattainment to attainment of the PM₁₀ NAAQS by preparing the following plan elements and tasks:
 - Document the extent of the PM₁₀ problem in Sacramento County
 - Determine the emission inventory sources contributing to the PM₁₀ problem
 - Identify the appropriate control measures that achieved attainment of the PM₁₀ NAAQS
 - Demonstrate maintenance of the PM₁₀ NAAQS
- Request formal redesignation to attainment of the PM₁₀ NAAQS (SMAQMD 2010a).

On December 7, 2010, following review of the maintenance plan and redesignation request, CARB submitted it to the U.S. EPA for approval. The U.S. EPA proposed redesignation of the area on July 24, 2013, and opened a public comment period for this action. Final U.S. EPA approval of the redesignation is pending as of this writing.

- 2009 Triennial Report and Plan Revision: This plan is intended to comply with the requirements of the CCAA as related to bringing the region into compliance with the CAAQS for ozone. The SMAQMD has prepared several triennial progress reports that build upon the 1994 Sacramento Area Regional Ozone Attainment Plan. The 2009 Triennial Report and Plan Revision (SMAQMD 2010b) is the most recent report. The triennial progress report includes a current emission inventory and projected future inventories of ROG and NO_x emissions in Sacramento County. The future inventories reflect population growth rates, travel, employment, industrial/commercial activities, and

energy use, as well as controls imposed through local, state, and federal emission reduction measures. The triennial report discusses rules that the SMAQMD has adopted during the previous 3 years, incentive programs that have been implemented, and other measures that would supplement those in the Ozone Attainment Plan to achieve the required 5% per year reduction required by the CCAA.

In addition, the SMAQMD has several rules that relate to the proposed project, which are summarized below.

Rule 201 – General Permit Requirements: Requires any project that includes the use of certain equipment capable of releasing emissions to the atmosphere as part of project operation to obtain a permit from the SMAQMD prior to operation of the equipment. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact the SMAQMD to determine if a permit is required. Portable construction equipment with an internal combustion engine over 50 horsepower are required to have a SMAQMD permit or a CARB portable equipment registration.

Rule 401 – Ringelmann Chart: Prohibits individuals from discharging into the atmosphere from any single source of emissions whatsoever any air contaminant whose opacity exceeds certain specified limits.

Rule 402 – Nuisance: To protect the public health, Rule 402 prohibits any person from discharging such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public.

Rule 403 – Fugitive Dust: Requires a person to take every reasonable precaution not to cause or allow the emissions of fugitive dust from being airborne beyond the property line from which the emission originates, from construction, handling or storage activity, or any wrecking, excavation, grading, clearing of land or solid waste disposal operation.

Rule 442 – Architectural Coatings: Sets VOC limits for coatings that are applied to stationary structures or their appurtenances. The rule also specifies storage and cleanup requirements for these coatings.

Rule 453 – Cutback and Emulsified Asphalt Paving Materials: Asphalt paving operations that may be associated with implementation of the project would be subject to Rule 453. This rule applies to the manufacture and use of cutback asphalt and emulsified asphalt for paving and maintenance operations.

Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways

To evaluate the potential cancer risks to sensitive receptors near high-traffic roadways, the SMAQMD developed the Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways (Roadway Protocol, SMAQMD 2011b) to provide further guidance on the CARB Air Quality and Land Use Handbook: A Community Health Perspective. While the Roadway Protocol has been endorsed by the SMAQMD Governing Board, it is not an adopted rule or regulation. This Protocol is intended to assist local land use jurisdictions in assessing the potential cancer risk of siting sensitive land uses adjacent to high-traffic roadways for diesel particulate matter only. With respect to the Roadway Protocol, a high-traffic roadway is defined as a “freeway, urban roadway with greater than 100,000 vehicles/day, or rural roadway with 50,000 vehicles/day” (SMAQMD 2011b). The Roadway Protocol is based on the finding in the CARB Handbook that traffic-related studies showed a 70% decrease in particulate matter concentrations at a distance of 500 feet from freeways and high-traffic roadways. The Roadway Protocol includes a screening approach based on an evaluation criterion. According to the Roadway Protocol, the evaluation criterion is based on the cancer risk 50 feet from a high-traffic roadway near a project site under evaluation that is no greater than 70% of the reasonable worst-case siting situation within the boundaries of the SMAQMD. The evaluation criterion is a cancer risk value that is based on the reasonable worst case siting situation within the boundaries of the SMAQMD. It is the level of increased individual risk corresponding to a 70% reduction from the highest roadway risk in Sacramento County, and is calculated based on a hypothetical sensitive receptor located 50 feet from the edge of the nearest travel lane for a high-traffic roadway. Based on 2011 traffic and emissions data used in the current version of the Roadway Protocol, the reasonable worst-case siting situation is a cancer risk of 919 in 1 million. Accordingly, the evaluation criterion is 276 in 1 million ($(100\% - 70\%) \times 919 \text{ in } 1 \text{ million} = 276 \text{ in } 1 \text{ million}$).

In summary, the Roadway Protocol includes three steps:

1. Determine if the nearest proposed sensitive receptor affected by the project is at least 500 feet from the nearest high-traffic roadway
2. Using the screening process described in the Roadway Protocol, determine if the nearest sensitive receptor's increase in individual cancer risk is lower than the evaluation criterion. If the risk is lower than the evaluation criterion, no further roadway-related air quality evaluation is recommended under the Roadway Protocol and the projected cancer risk value and screening table used should be disclosed in the environmental documentation

3. If the risk exceeds the evaluation criterion, complete a site-specific HRA using procedures recommended in the Protocol, and disclose this information in the environmental documentation.

Following the steps in the Roadway Protocol, sensitive receptors (residences) on the project site would be located within 500 feet from the Capital City Freeway. According to traffic data from Caltrans, existing (2011) annual average daily traffic (AADT) on the Capital City Freeway within the vicinity of the project site of up to 159,000.³ Thus, it would be considered a high-traffic roadway under the first step. The Capital City Freeway runs roughly east to west adjacent to the proposed project site. The screening tables in the Roadway Protocol provide set distances from the nearest lane of the roadway (e.g., 50 feet, 100 feet) and peak-hour traffic volumes (e.g., 4,000 trips per hour, 8,000 trips per hour). Using the screening table for a project site located south of an east-west roadway, a distance of 50 feet from the nearest lane to a residence, and peak-hour hourly trips of 12,000 (Caltrans data indicates the 2011 traffic volume is 11,700 trips per hour on the Capital City Freeway in the vicinity of the project site⁴), the predicted cancer risk is 200 in 1 million. Accordingly for the McKinley Village Project, the evaluation criterion would not be exceeded. As explained in Impact 4.1-6, however, a site-specific health risk assessment was conducted for the proposed project and is included in Appendix C.

City of Sacramento 2030 General Plan

In 2001 the City amended its General Plan to incorporate smart growth principles. These principles, which have informed the development of guiding principles for the 2030 General Plan, are intended to change urban development patterns so that development, through density and mix of land uses, transportation management, and infrastructure design and construction, would discourage urban sprawl, promote infill development, reduce VMT, and minimize air pollutant emissions. The City of Sacramento's air quality and climate change Goals and Policies are provided in the Environmental Resources (ER) Element and the Utilities (U) Element of the General Plan and are as follows (City of Sacramento 2009a).

³ <http://traffic-counts.dot.ca.gov/2011all/index.html>. The 2012 data indicate an AADT of 162,000. Using the 2012 data would not change the determination that the Capital City Freeway would be considered a high-traffic roadway.

⁴ 2011 traffic volumes were used to be consistent with the Roadway Protocol, which relies on 2011 traffic and emissions data. Thus, the use of traffic volumes in other years would not be appropriate for using the screening tables. SMAQMD updates their protocol every few years to accommodate changed conditions. However, the most current information available, per the Roadway Protocol, is 2011 data.

Environmental Resources

Goal ER 6.1 Improved Air Quality. Improve the health and sustainability of the community through improved regional air quality and reduced greenhouse gas emissions that contribute to climate change.

Policy ER 6.1.2 New Development. The City shall review proposed development projects to ensure projects incorporate feasible measures that reduce construction and operational emissions for reactive organic gases, nitrogen oxides, and particulate matter (PM10 and PM2.5) through project design.

Policy ER 6.1.3 Emissions Reduction. The City shall require development projects that exceed SMAQMD ROG and NO_x operational thresholds to incorporate design or operational features that reduce emissions equal to 15 percent from the level that would be produced by an unmitigated project.

Policy ER 6.1.4 Protect all Residents Equally. The City shall ensure that all land use decisions are made in an equitable fashion in order to protect residents, regardless of age, culture, ethnicity, gender, race, socioeconomic status, or geographic location, from the health effects of air pollution.

Policy ER 6.1.5 Development near TAC Sources. The City shall ensure that new development with sensitive uses located adjacent to toxic air contaminant sources, as identified by the California Air Resources Board (CARB), minimizes potential health risks. In its review of these new development projects, the City shall consider current guidance provided by and consult with CARB and SMAQMD.

Policy ER 6.1.6 Sensitive Uses. The City shall require new development with sensitive uses located adjacent to mobile and stationary toxic air contaminants (TAC) be designed with consideration of site and building orientation, location of trees, and incorporation of appropriate technology for improved air quality (i.e., ventilation and filtration) to lessen any potential health risks. In addition, the City shall require preparation of a health risk assessment, if recommended by Sacramento Metropolitan Air Quality Management District, to identify health issues, reduce exposure to sensitive receptors, and/or to implement alternative approached to development that reduces exposure to TAC sources.

Policy ER 6.1.8 Citywide Greenhouse Gas Assessment. The City shall comply with pertinent State regulations to assess citywide greenhouse gas emissions for existing land uses and the adopted General Plan buildout.

Policy ER 6.1.9 Greenhouse Gas Reduction in New Development. The City shall reduce greenhouse gas emissions from new development by discouraging auto-dependent sprawl and dependence on the private automobile; promoting water conservation and recycling; promoting development that is compact, mixed use, pedestrian friendly, and transit oriented; promoting energy-efficient building design and site planning; improving the jobs/housing ratio in each community; and other methods of reducing emissions.

Policy ER 6.1.11 Coordination with SMAQMD. The City shall coordinate with SMAQMD to ensure projects incorporate feasible mitigation measures if not already provided for through project design.

Policy ER 6.1.14 Zero-Emission and Low-Emission Vehicle Use. The City shall encourage the use of zero-emission vehicles, low-emission vehicles, bicycles and other non-motorized vehicles, and car-sharing programs by requiring sufficient and convenient infrastructure and parking facilities in residential developments and employment centers to accommodate these vehicles.

Utilities

Goal U.6.1 Adequate Level of Service. Provide for the energy needs of the city and decrease dependence on nonrenewable energy sources through energy conservation, efficiency, and renewable resource strategies.

Policy U 6.1.5 Energy Consumption per Capita. The City shall encourage residents and businesses to consume 25 percent less energy by 2030 compared to the baseline year of 2005.

Policy U 6.1.7 Solar Access. The City shall ensure, to the extent feasible, that sites, subdivisions, landscaping, and buildings are configured and designed to maximize solar access.

City of Sacramento Climate Action Plan

In order to directly address the issue of climate change and GHG emissions, the City of Sacramento adopted its CAP on February 14, 2012. The CAP describes GHG emissions from uses and activities within the City and establishes policies, actions, and implementation measures to reduce existing and future GHG emissions. As part of the CAP development process, a baseline GHG emissions inventory for the year 2005 was created that determined the City of Sacramento generated approximately 4.1 MMT CO₂e in 2005. The CAP also established a GHG emissions reduction target of 15% below 2005 levels by the year 2020 and GHG reduction goals of 38% below 2005 levels by the year 2030 and 83% below 2005 levels by

the year 2050. The CAP sets forth strategies and measures related to the following topics of GHG reduction:

- Strategy 1: Sustainable Land Use
- Strategy 2: Mobility and Connectivity
- Strategy 3: Energy Efficiency and Renewable Energy
- Strategy 4: Waste Reduction and Recycling
- Strategy 5: Water Conservation and Wastewater Reduction
- Strategy 6: Climate Change Adaptation
- Strategy 7: Community Involvement and Empowerment

The City intends to use the CAP to streamline CEQA review for projects that are determined to be consistent with the CAP, pursuant to Section 15183.5 of the State CEQA Guidelines.

4.1.4 Impacts and Mitigation Measures

Methods of Analysis

The discussion below presents the methodologies used to conduct the air quality analysis, as well as to assess the significance of the identified impacts within this section.

Construction-Related and Operational Emissions

The proposed project's short-term construction-related and long-term operational emissions were estimated using the California Emissions Estimator Model (CalEEMod) software, a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the Institute of Transportation Engineers Trip Generation Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data were input into the model (e.g., construction phases, timing, equipment, and estimated daily project trips). All project modeling results are included in Appendix B to this Draft EIR.

Toxic Air Contaminants

Impacts of the environment on a project or plan (as opposed to impacts of a project or plan on the environment) are beyond the scope of required CEQA review. "[T]he purpose of an EIR is to identify the significant effects of a project on the environment, not the significant effects of the environment on the project." (*Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201

Cal.App.4th 455, 473.) The impacts discussed in this section related to Toxic Air Contaminants associated with the existing Capital City Freeway and UPRR operations are effects on users of the project and structures in the project of preexisting environmental hazards, as explicitly found by the court in the *Ballona* decision, and therefore “do not relate to environmental impacts under CEQA and cannot support an argument that the effects of the environment on the project must be analyzed in an EIR.” (*Id.* at p. 475.) Nonetheless, an analysis of these impacts is provided for informational purposes.

In response to a request from the SMAQMD as well as NOP commenters to evaluate the potential health effects on sensitive receptors a Health Risk Assessment (HRA) was prepared for the project. The HRA evaluated the potential for toxic air contaminants associated with diesel particulate matter due to proximity to the freeway and the Union Pacific Railroad (UPRR) tracks to affect the health of future residents (please see Section 4.6, Noise or Chapter 2, Project Description, for an overview of the assumptions used for the number of trains). The land use siting recommendations in the CARB Air Quality and Land Use Handbook: A Community Health Perspective (CARB 2005) along with SMAQMD’s Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways (SMAQMD 2011b) were reviewed. As stated in the Air Quality and Land Use Handbook, “[t]hese [land use siting] recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.” However, they can be used to evaluate whether the siting of a sensitive receptor close to existing sources of toxic air contaminants could result in adverse health effects. To understand the potential health effects and respond to NOP comments, air quality dispersion modeling was conducted using the American Meteorological Society/ Environmental Protection Agency Regulatory Model (AERMOD). The analysis considers a 70-year exposure scenario (i.e., residents would be continually exposed to emissions from the freeway and rail lines for an assumed lifetime of 70 years) consistent with guidance from SMAQMD. A 70-year exposure period is very conservative (i.e., health protective) and assumes residents would be exposed continuously to DPM emissions from the freeway and UPRR rail lines for an assumed lifetime of 70 years. This assumption is a standard worst-case exposure scenario for the purposes of assessing health effects associated with exposure to toxic air contaminants as recommended by the California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA) and air districts. Most residents would not live at the same location for 70 years. People tend to live at a given location for approximately 9 years (average) to 30 years (95th percentile).⁵ Thus, the estimated cancer risk would be lower for more typical residency periods.

⁵ The alternative 9-year and 30-year periods for evaluating cancer risk per the OEHHA guidance manual for health risk assessments prepared under the Air Toxics “Hot Spots” program (OEHHA 2003) are based on the U.S. Environmental Protection Agency (EPA) Exposure Factors Handbook (EPA 1997). This handbook indicates that 9 years is the average “population mobility” and 30 years is

The California Almanac of Emissions and Air Quality (CARB, 2009) lists the regional background average cancer risk for diesel particulate matter as 360 in 1 million.

The HRA (see Appendix C) includes the results of this modeling.

Climate Change

The issue of global climate change is inherently a cumulative issue as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed project's impact to climate change is addressed only as a cumulative impact.

In February 2012, the City developed the CAP to reduce GHG emissions pursuant to AB 32. Using the City's CAP Consistency Review Checklist as a guide, this analysis evaluates whether the proposed project would comply with the City's Climate Action Plan. A "yes" or "not applicable" response to each of the CAP Consistency Review Checklist questions would result in a determination that the proposed project complies with the City's Climate Action Plan. A "no" response demonstrates the proposed project is not fully compliant with the City's CAP and additional analysis would be required. The project complies with the City's CAP, as shown in the CAP Checklist included in Appendix G.

CEQA Guidelines Section 15183.5 provides a procedure for the analysis and mitigation of GHG emissions through the preparation and implementation of a climate action plan that satisfies specific requirements. The City prepared the CAP with the intention that the CAP would implement the climate change-related General Plan policies and would qualify under Section 15183.5 as a plan for the reduction of GHG emissions for use in cumulative impact analysis pertaining to development projects. Projects that demonstrate consistency with the CAP would not result in an increase in GHG emissions beyond what the City has identified and mitigated for in the CAP and the impact would be less than significant.

To provide a full understanding of the proposed project's potential contribution to climate change, the project's short-term construction-related and long-term operational GHG emissions were estimated using the CalEEMod software. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO₂ equivalent units of measure (i.e., MT CO₂e), based on the global warming potential of the individual pollutants, as shown below in Table 4.1-11.

the 95th percentile value. In other words, only 5% of residents live at any given location for more than 30 years.

Thresholds of Significance

The significance criteria used to evaluate the project impacts are based on Appendix G of the CEQA Guidelines, the SMAQMD thresholds, the thresholds adopted by the City in applicable general plans and previous environmental documents, and professional judgment. A significant impact related to air quality and climate change would occur if the project would:

- result in short-term (construction) emissions of NO_x above 85 pounds per day;
- result in long-term (operational) emissions of NO_x or ROG above 65 pounds per day
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in PM₁₀ concentrations equal to or greater than five percent of the state ambient air quality standard (i.e., 50 micrograms/cubic meter for 24 hours) in areas where there is evidence of existing or projected violations of this standard. Further, the SMAQMD holds that if project/plan emissions of NO_x and ROG are below the emission thresholds given above, then the project/plan would not threaten violations of the PM₁₀ ambient air quality standards;
- result in CO concentrations that exceed the 1-hour state ambient air quality standard (i.e., 20.0 ppm) or the 8-hour state ambient standard (i.e., 9.0 ppm);
- result in the exposure of sensitive receptors to substantial pollutant concentrations;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project area is in non-attainment under an applicable federal or state ambient air quality standard (including the release of emissions that exceed quantitative thresholds for ozone precursors);
- impede the City or state efforts to meet AB32 standards for the reduction of greenhouse gas emissions; or
- conflict with the City's Climate Action Plan.

Ambient air quality standards have not been established for TACs. The City has determined TAC exposure is deemed to be significant if:

- TAC exposures create a lifetime cancer risk exceeding 10 in 1 million for stationary sources, or substantially increase the lifetime cancer risk as a result of increased exposure to TACs from mobile sources.

Project-Specific Impacts and Mitigation Measures

4.1-1: The proposed project would result in short-term (construction) emissions of NO_x above 85 pounds per day. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

The approximately 48.75-acre project site exceeds the SMAQMD NO_x Construction Screening Level, which provides that under certain criteria projects on sites of 35 acres or less will generally generate less than significant NO_x emissions. Because the project exceeds the 35 acre screening level size, emissions modeling was prepared for the proposed project using the CalEEMod land use and emissions modeling program (version 2013.2.1). Modeling inputs were based on the proposed project as presented in Chapter 2, Project Description, the project-specific construction timeline (with construction occurring during each of four years) and equipment usage information provided by the project applicant, and the implementation of SMAQMD's Basic Construction Emission Control Practices, which is required for all construction activities within the SMAQMD jurisdiction. These measures include watering the construction site twice daily, limiting vehicle speeds on unpaved roadways to 15 miles per hour, minimizing vehicle idling, covering haul trucks transporting soil, and cleaning paved roads. The construction phases and the maximum daily NO_x emissions for each phase are shown in Table 4.1-7. The total annual NO_x emissions during construction are shown in Table 4.1-8. The emissions shown in Table 4.1-7 are classified by the year in which the emissions would occur, the individual construction phase within each year and the specific months of that year during which that phase would occur. For example, construction of the 40th Street underpass would occur between July and December of 2014 and in January of 2015; thus Table 4.1-7 identifies daily emissions for construction of the underpass improvements in each year. Table 4.1-7 identifies the NO_x emissions associated with each individual construction phase and the total simultaneous emissions from overlapping phases.

To reflect the project phasing presented in Table 4.1-7, five separate CalEEMod modeling runs were completed. Appendix B includes results for annual and summer emissions for each construction phase, and annual, summer, and winter emissions for overall project operation:

1. Site Preparation and Overall Project Operation: this modeling run includes the following construction phases:
 - a. Site Preparation from May 1, 2014 to May 14, 2014
 - b. Grading from May 15, 2014 to July 31, 2014
 - c. Utilities/Trenching from August 1, 2014 to September 30, 2014
 - d. UPRR Underpass Construction from July 1, 2014 to January 30, 2015

- e. 40th Street Extension from July 1, 2014 to November 28, 2014
- f. Backbone (onsite) Roadway Infrastructure from October 1, 2014 to November 28, 2014
2. Building Construction Phase 1A from December 1, 2014 to April 30, 2015 (construction of 16 Model Homes and the recreation center)
3. Building Construction Phase 1B from May 1, 2015 to November 1, 2015 (construction of 94 homes)
4. Building Construction Phase 2 from November 2, 2015 to October 30, 2016 (construction of 109 homes)
5. Building Construction Phase 3 from November 1, 2016 to November 30, 2017 (construction of 109 homes)

As reflected in the CalEEMod results and summarized in Table 4.1-7, project construction would generate more than 85 pounds per day of NO_x emissions only during the month of July 2014, when site grading and construction of the 40th Street underpass and extension of 40th Street would overlap. During this month, the unmitigated construction emissions would be 150.04 pounds per day. Generation of NO_x emissions that exceed 85 pounds per day during this project construction phases would result in a **significant impact**.

The Mitigated Emissions columns of Tables 4.1-7 and 4.1-8 reflect implementation of the SMAQMD Basic Construction Emission Control Practices (summarized above) and the Enhanced Exhaust Control Practices described in Sections 3.4.1 and 3.4.2 of the SMAQMD CEQA Handbook and required under Mitigation Measure 4.1-1(a). With implementation of this mitigation measures, NO_x emissions during July 2014 would be reduced to 120.20 pounds per day. Because construction NO_x emissions would still exceed 85 pounds per day during July 2014, additional mitigation in the form of payment into the SMAQMD off-site mitigation program is necessary.

**Table 4.1-7
Construction Phase NO_x Emissions (pounds per day)**

Construction Year	Construction Phase	Timing	NO _x Emissions			
			Single Phase Emissions		Combined Emissions from Overlapping Phases	
			Unmitigated	Mitigated	Unmitigated	Mitigated
2014	Site Preparation	May 1–May 14	19.95	16.01	No overlap	
	Grading	May 15–end of July	119.33	95.54	150.04 (July)	120.20 (July)
	UPRR Underpass	July–December	15.67	12.61	49.84 (August and September)	40.02 (August and September)
	40th Street	July–end of November	15.04	12.05		
	Utilities/Trenching	August–September	19.13	15.36	60.73 (November)	48.69 (November)
	Paving Onsite	October–end of November	30.04	24.06		
	Building Construction (Phase A)	December	19.86	16.04	50.86 (December, includes UPRR underpass)	40.93 (December, includes UPRR underpass)
	Architectural Coatings (Phase A)	December	15.33	12.28		
2015	UPRR Underpass	January	14.96	12.03	47.85 (January)	38.49 (January)
	Building Construction (Phase A)	January – April	18.68	15.08	32.86 (February – April)	26.46 (February - April)
	Architectural Coatings (Phase A)	January – April	14.21	11.38	79.80 (May – December)	64.23 (May – December)
	Building Construction (Phases 1 and 2)	May – December	37.16	30.11		
	Architectural	May – December	42.64	34.12		

**Table 4.1-7
Construction Phase NO_x Emissions (pounds per day)**

Construction Year	Construction Phase	Timing	NO _x Emissions			
			Single Phase Emissions		Combined Emissions from Overlapping Phases	
			Unmitigated	Mitigated	Unmitigated	Mitigated
	Coatings (Phases 1 and 2)					
2016	Building Construction	All Year	34.70	28.09	74.25	59.66
	Architectural Coatings	All Year	39.45	31.57		
2017	Building Construction	January–November	32.11	25.98	68.55	55.14
	Architectural Coatings	January–November	36.44	29.16		

Source: Dudek 2013.

**Table 4.1-8
Construction Generated Annual NO_x Emissions (tons)**

Emission Source and Year	Unmitigated Emissions	Mitigated Emissions
Construction 2014	6.36	5.10
Construction 2015	7.14	5.75
Construction 2016	9.63	7.75
Construction 2017	8.19	6.58

Source: See Appendix B.

Mitigation Measures

As noted above, all construction projects in the SMAQMD jurisdiction are required to implement SMAQMD's Basic Construction Emission Control Practices and are required to comply with District Rules and Regulations, including those identified in the Regulatory Setting section above. In addition, Mitigation Measure 4.1-1(a) requires the project applicant to implement the SMAQMD Enhanced Exhaust Control Practices to minimize construction emissions. The resulting maximum daily emissions after implementing these control practices are shown in Table 4.1-7, above. Because these practices would not be sufficient to reduce construction emissions below 85 pounds per day, Mitigation Measure 4.1-1(b) requires the project applicant to pay a mitigation fee into the SMAQMD's off-site mitigation program. SMAQMD uses the mitigation program fees to purchase emission reductions in the Sacramento region. As described by the SMAQMD (2005), "the mitigation fee is calculated based on the amount of the emissions over the construction threshold and the cost of reducing equivalent off-site emissions. Mitigation fees are used by SMAQMD to fund cost-effective and quantifiable emission reduction projects, such as replacing older construction equipment engines with newer, lower emission engines." As of July 1, 2013, the current mitigation fee rate is \$17,460 per ton of emissions in excess of the SMAQMD NO_x threshold. A calculation of the total tons of emissions in excess of the threshold and the resulting fee payment required for this project was completed using the SMAQMD calculator spreadsheet. As indicated on the completed spreadsheet provided in Appendix B, the mitigation fee is estimated to be \$10,422.00. With payment of the mitigation fee, impacts associated with construction NO_x emissions would be reduced to a **less-than-significant level**.

4.1-1(a) The following Enhanced Exhaust Control Practices shall be implemented to minimize NO_x emissions during all construction activities associated with the proposed project.

- The project shall provide a plan for approval by the lead agency and the Sacramento Metropolitan Air Quality Management District demonstrating that the heavy-duty (50 horsepower [hp] or more) off-

road vehicles to be used during construction, including owned, leased, and subcontractor vehicles, shall achieve a project-wide fleet-average 20% NO_x reduction and 45% particulate reduction compared to the most recent California Air Resources Board (CARB) fleet average. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. The Sacramento Metropolitan Air Quality Management District's Construction Mitigation Calculator shall be used to identify an equipment fleet that achieves this reduction.

- The project representative shall submit to the lead agency and the Air District a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of project construction. The inventory shall include the horsepower rating, engine model year, and projected hours of use for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the Air District with the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman. The District's Model Equipment List can be used to submit this information.
- The project shall ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) shall be repaired immediately. Noncompliant equipment will be documented and a summary provided to the lead agency and Air District monthly. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the project, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. The Air District and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section shall supersede other Air District, state, or federal rules or regulations.

- If at the time of construction, the Air District has adopted a regulation applicable to construction emissions, compliance with the regulation may completely or partially replace this mitigation. Consultation with the Air District prior to construction shall be required to make this determination.

4.1-1(b) At the time grading permits are issued, the project applicant shall pay the SMAQMD off-site mitigation program fee, which shall be calculated based on the estimated amount of NO_x emissions that exceed 85 pounds per day during each day of project construction after onsite construction mitigation (both the Basic Construction Emission Control Practices and the Enhanced Exhaust Control Practices) is applied. In consultation with the SMAQMD staff, and prior to the issuance of a grading permit, a construction mitigation fee and associated administrative fee shall be calculated and paid to the SMAQMD. Fees shall be calculated using the Carl Moyer cost effectiveness rate as determined at the time grading permits are issued (currently \$17,460 per ton of NO_x) plus a 5% administrative fee, or the applicable fee amounts in effect at the time of permit/plan issuance.

4.1-2: The proposed project could result in long-term (operational) emissions of NO_x or ROG above 65 pounds per day. Based on the analysis below the impact is less than significant.

CalEEMod was used to model emissions from project operations with the exception of the use of consumer products. The ROG emissions from use of consumer products were calculated separately because the model inappropriately applies the consumer product emission rate to all land uses reflected in the model, including paved surfaces and parking lots. To calculate consumer product ROG emissions, the CalEEMod consumer product emission rate was applied to the project's total building square footage, assuming an average residential unit size of 2,036 sf, 40 418-sf granny flats, and a 2,000-sf retail space (e.g., restaurant, café, shop or other retail use) associated with the recreation center. The CalEEMod estimates of ROG and NO_x emissions during operation of the proposed project and consumer products ROG emissions calculated outside CalEEMod are shown in Table 4.1-9.

**Table 4.1-9
Operational ROG and NO_x Emissions (pounds per day)**

Source	ROG Emissions		NO _x Emissions	
	<i>Unmitigated</i>	<i>Mitigated</i>	<i>Unmitigated</i>	<i>Mitigated</i>
<i>Summer</i>				
Area – excluding consumer products	10.99	10.99	0.36	0.36
Consumer Products	13.03	13.03	-	-
Energy	0.31	0.19	2.66	1.63
Mobile	36.19	34.23	33.56	31.74
Total Summer	60.52	58.44	36.58	33.73
<i>Winter</i>				
Area - excluding consumer products	10.99	10.99	0.36	0.36
Consumer Products	13.03	13.03	-	-
Energy	0.31	0.23	2.66	1.96
Mobile	39.46	37.21	37.69	35.62
Total	63.79	61.42	40.71	37.61

Source: Dudek 2013.

As shown in Table 4.1-9, ROG emissions would remain 1.21 pounds per day below the SMAQMD threshold during winter and 4.48 pounds per day below the threshold during summer. NO_x emissions would remain well below the threshold. As part of complying with the City's CAP, the project would include design features that would increase energy efficiency. Further, the project includes measures to support pedestrian and bicycle activity; and by its location, the project supports use of alternative transportation. These features would serve to slightly reduce NO_x and ROG emissions from the project, as reflected in the mitigated operational emissions shown in Table 4.1-9. Because project emissions would be less than the threshold of 65 pounds per day, the project's impact due to long-term ROG and NO_x emissions would be less than significant. Additionally, the requirement to incorporate additional emission reduction features in accordance with General Plan Policy ER 6.1.3 is not applicable because project emissions would be less than 65 pounds per day. Because the proposed project would not exceed the 65 pounds per day threshold, the impact is **less than significant**.

Mitigation Measures

None required.

4.1-3: The proposed project could violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in PM₁₀ concentrations equal to or greater than 5% of the state ambient air quality standard (i.e., 50 micrograms/cubic meter for 24 hours) during project construction. Based on the analysis below the impact is *less than significant*.

SMAQMD provides two screening criteria for considering the potential for the PM₁₀ emissions from a project to violate an air quality standard or contribute substantially to an existing or projected violation. The screening criteria provide that a project would have a less than significant impact related to PM₁₀ emissions if the project disturbs 15 acres or less per day during project construction (during site clearing and grading) and the project implements all of the SMAQMD Basic Construction Emission Control Practices, as noted below.

The proposed project site is approximately 48.75 acres. Grading would occur over a 56-day period (anticipated to occur between mid-May and the end of July 2014). Under the proposed grading schedule, less than 15 acres would be disturbed on any single day. As described above, implementation of SMAQMD's Basic Construction Emission Control Practices is required for all construction activities within the SMAQMD jurisdiction. These measures include watering the construction site twice daily, covering haul loads or maintaining at least 2 feet of freeboard space, limiting vehicle speeds on unpaved roadways to 15 miles per hour, paving surfaces as soon as possible, cleaning paved roads, and properly maintaining construction equipment. The proposed project would meet both of the SMAQMD screening criteria and therefore would have a **less than significant impact** from PM₁₀ emissions during construction.

Mitigation Measures

None required.

4.1-4: The proposed project could result in CO concentrations that exceed the 1-hour state ambient air quality standard (i.e., 20.0 ppm) or the 8-hour state ambient standard (i.e., 9.0 ppm). Based on the analysis below the impact is *less than significant*.

Motor vehicles are the primary source of CO. The SMAQMD CEQA Guide to Air Quality Assessment provides two tiers of screening criteria to determine whether air quality modeling to evaluate CO concentrations is necessary. The proposed project does not meet the first tier of screening because it would add traffic to an intersection that already operates

at level of service (LOS) E or F. The second tier of screening provides that if the project meets all of the following criteria, it would have a less-than-significant impact to air quality related to local CO concentrations:

- The project will not result in an affected intersection experiencing more than 31,600 vehicles per hour;
- The project will not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway; or other locations where horizontal or vertical mixing of air will be substantially limited; and
- The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average (as identified by the EMFAC or CalEEMod models).

Based on the traffic analysis prepared for the project, the proposed project would meet all of the SMAQMD's CO hotspot second tier screening criteria and would not generate traffic volumes that could cause CO hotspots at local intersections and would not adversely affect sensitive receptors. This impact is **less than significant**.

Mitigation Measures

None required.

4.1-5: The proposed project could result in the exposure of sensitive receptors to substantial pollutant concentrations. Based on the analysis below the impact is less than significant.

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those persons termed "sensitive receptors" are the most serious hazards of existing air quality conditions. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution, include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors include residences, schools, playgrounds, child-care centers, athletic facilities, long-term health-care facilities, rehabilitation centers, convalescent centers, and retirement homes.

The proposed project does not include stationary sources that would emit air pollutants or TACs, such as large boilers, emergency generators, or manufacturing facilities. Thus, the project would not result in emissions of TAC from such stationary sources. Potential impacts

from TACs from mobile sources on the residents of the proposed project are addressed in Impact 4.1-6

The primary air pollutants that could be associated with exposure of sensitive receptors to substantial concentrations include PM₁₀ and PM_{2.5}, primarily from construction activity, and CO, related to elevated concentration (“hotspots”) resulting from cumulative traffic at congested intersections. The proposed project would not result in substantial emissions or concentrations of PM₁₀, PM_{2.5}, or CO, as discussed in Impacts 4.1-3 and 4.1-4 above. Furthermore, as discussed in Impact 4.1.-2, the operational emissions from the proposed project would not exceed the SMAQMD significance threshold for NO_x, much of which would be associated with motor vehicles dispersed throughout the area rather than contributing to local effects on sensitive receptors. Therefore, the project would have a **less-than-significant impact** related to exposure of sensitive receptors to substantial pollutant concentrations.

Mitigation Measures

None required.

4.1-6: The proposed project could result in increased exposure to TACs from mobile sources, potentially increasing the lifetime cancer risk of future residents. Based on the analysis below the impact is *less than significant*.

To address potential health effects resulting from emissions of TACs (specifically, diesel engine exhaust particulate matter or DPM) generated by motor vehicles (specifically trucks or mobile sources) on the adjacent Capital City Freeway as well as trains passing by the site on the UPRR tracks, an HRA was prepared for the project (see Appendix C) for the reasons discussed below. As discussed in Impact 4.1-5, the project does not include any stationary sources, nor is the project located near any stationary sources that generate DPM; therefore, this analysis only addresses the impact of mobile source emissions on the project. This analysis is consistent with General Plan Policies ER 6.1.5 and ER 6.1.6 and includes consideration of guidance provided by CARB and SMAQMD.

The CARB’s Air Quality and Land Use Handbook: A Community Health Perspective (CARB 2005) addresses the importance of considering health risk issues when siting sensitive land uses including residential development within the vicinity of existing freeways or high traffic roads, distribution centers, ports, rail yards, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities. The CARB Handbook draws upon studies evaluating the health effects of traffic traveling on major interstate highways in metropolitan California centers and specifically recommends that new development, “[a]void siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day” (CARB 2005). The CARB Handbook identifies these guidelines

as strictly advisory and recognizes that “land use decisions are a local government responsibility. The CARB Handbook is advisory and these recommendations do not establish regulatory standards of any kind.” As noted in the HRA, the Capital City Freeway runs east to west adjacent to the project site. Existing annual average daily traffic (AADT) on the freeway within the vicinity of the project site is up to 159,000, which is above the CARB advisory guideline established for urban roadways of 100,000 vehicles/day. The majority of the vehicles are 2- and 3-axle vehicles that are mostly gasoline powered, while a portion are larger 4- and 5-axle trucks that are powered by diesel engines (see Appendix C). On the south side of the project site, the UPRR tracks run in an east–west orientation and on the east side of the project, in a north-south orientation. The CARB Handbook does not include siting recommendations regarding rail lines, although locomotives are also a source of DPM. Therefore, to provide a comprehensive evaluation of DPM emissions from both trucks and locomotives in the vicinity of the project site, locomotive emissions were evaluated and included in the HRA.

The SMAQMD’s Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways (Roadway Protocol) (SMAQMD 2011b) was developed to provide further local guidance on the issues addressed in the CARB Handbook. This protocol is intended to assist local land use jurisdictions in assessing the potential cancer risk from DPM for sensitive land uses adjacent to high traffic roadways (SMAQMD 2011). SMAQMD’s protocol recommends the use of an evaluation criterion to assess the cancer risk to sensitive receptors near high-traffic roadways. The criterion is the level of increased individual risk that is a 70% reduction relative to the highest existing roadway cancer risk in Sacramento County. Cancer risk is defined as the increase in lifetime probability (chance) of an individual developing cancer due to exposure to a carcinogenic compound, typically expressed as the increased probability in 1 million.

Per the Roadway Protocol, the evaluation criterion is a cancer risk value based on the reasonable worst-case siting situation within the boundaries of the air district. For 2011 and later evaluations, the evaluation criterion used by SMAQMD is a cancer risk of 276 in 1 million.⁶ The California Almanac of Emissions and Air Quality (CARB, 2009) lists the regional background average cancer risk for diesel particulate matter as 360 in 1 million.

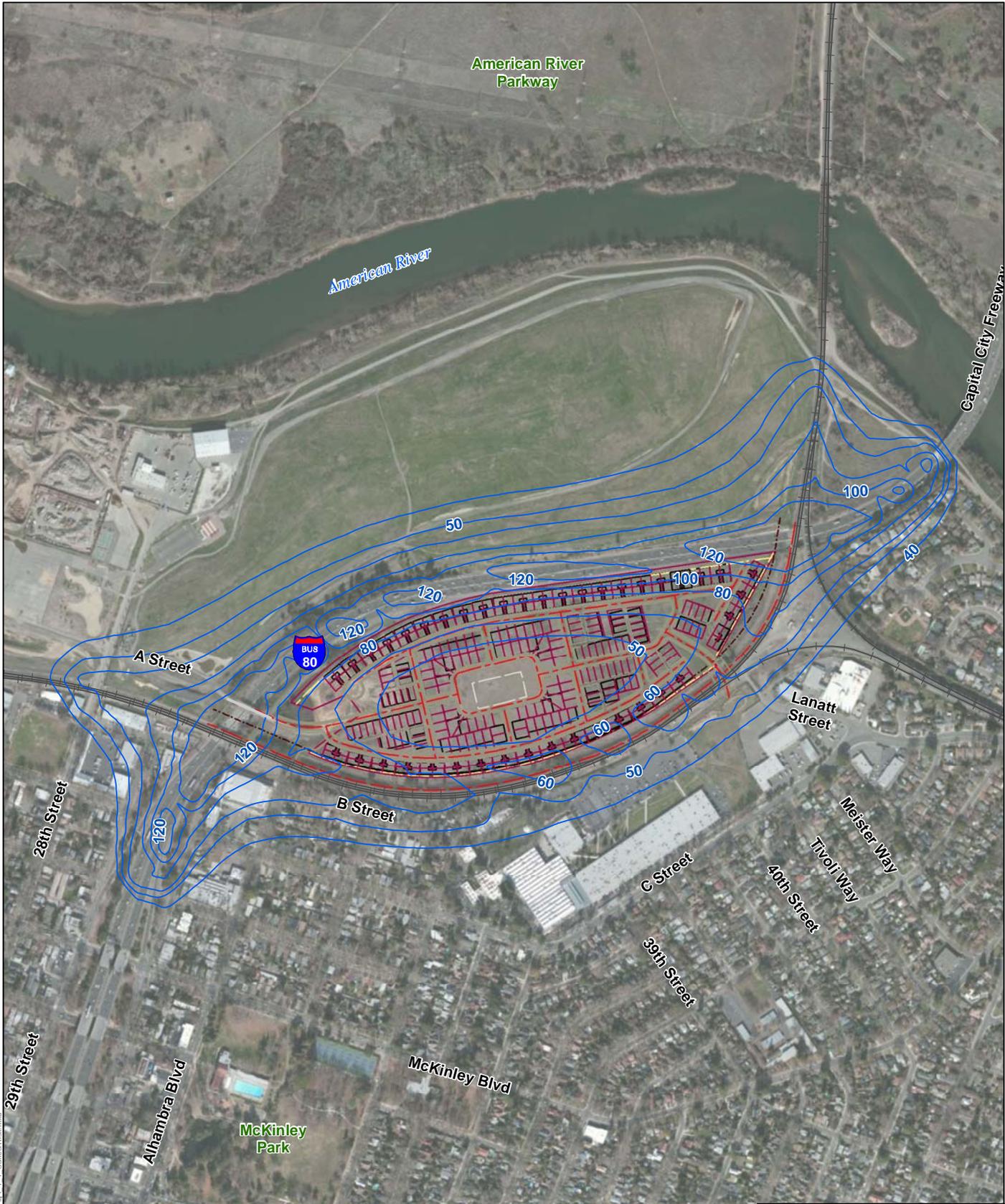
As noted above, the SMAQMD developed the Roadway Protocol to evaluate cancer risk due to DPM emissions from vehicles traveling on a high-traffic roadway close to a proposed project site and to provide a screening approach that would not involve complex analysis for many projects. As noted in Section 4.1.3 above, using the Roadway Protocol, the estimated cancer risk due to

⁶ 276 in 1 million is the SMAQMD current criterion for evaluating cancer risks on projects near high traffic roadways. It does not consider background conditions resulting from concentrations of other TACs in the ambient air or from other sources. Pursuant to the Roadway Protocol, each project must assess the potential cancer risk from on-road mobile source TACs at the project site and report that risk. If the cancer risk from on-road mobile source TACs is greater than 276 in 1 million, the project must prepare an HRA. If the risk is less than 276 in 1 million, no further evaluation is required.

DPM emissions from the Capital City Freeway would be 200 in 1 million, which is less than the SMAQMD evaluation criterion. The McKinley Village project site, however, is also bounded by the UPRR tracks. Locomotives traveling on those tracks are another source of DPM emissions. Therefore, the use of the screening approach in the Roadway Protocol is not directly applicable because the source of DPM emissions is not the roadway only. Furthermore, the SMAQMD and NOP commenters requested that an HRA be prepared. Accordingly, the HRA was conducted to evaluate the potential cancer risk to residents of the proposed project more comprehensively.

To determine the health effects of DPM, air quality dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). (See Appendix C for information on the model inputs used.) The analysis considers a 70-year continuous exposure scenario consistent with the methodology used in the Roadway Protocol. Based on the results of the dispersion model and health effect calculations that convert the modeled concentrations to cancer risk, it was determined that one residence, which would be closest to the freeway and the UPRR tracks at the eastern end of the proposed project, would be exposed to a cancer risk of approximately 120 in 1 million under a 70-year exposure scenario, which is less than SMAQMD's evaluation criterion of 276 in 1 million. As shown in Figure 4.1-1, Modeled Cancer Risk Due to DPM Emissions, residents in nearly all of the project site, would be exposed to a lower cancer risk of approximately 80 in 1 million or less. In addition, the HRA estimated the "cancer burden" among residents of the proposed project due to DPM emissions from trucks and locomotives. Unlike cancer risk, which is the lifetime *probability* (chances) of an individual developing cancer due to exposure to a carcinogenic compound, cancer burden uses the cancer risk estimates to compute the estimated number of theoretical cancer cases in a defined population resulting from a lifetime exposure to carcinogenic TACs. As reported in the HRA, the nominal cancer risk over the project site of approximately 80 in 1 million was multiplied by the project population of 656 persons to give a cancer burden of 0.05. Accordingly, the cancer burden indicates that less than one person might contract cancer assuming a 70-year continual exposure under the modeled scenario of DPM emissions. Thus, there would not be a substantial increase in potential cancer cases as a result of the proposed project.

While not required to reduce impacts from TACs, the project includes planting of redwood trees in the landscape buffer area adjacent to the freeway in order to further reduce toxic exposure from DPM. While the reduction in TAC exposure that results from trees cannot be quantified, some studies have indicated that these trees do help reduce TAC from the air and are an effective means to minimize exposure (SMAQMD 2011b, CARB 2012).



Path: Z:\Projects\178-2001\WAP\DOCS\MAPS\ER\Fig4.1.1_CancerRisk.mxd

SOURCE: ESRI; County of Sacramento 2012

FIGURE 4.1-1
Modeled Cancer Risk Due to DPM Emissions

7828

MCKINLEY VILLAGE PROJECT EIR

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The SMAQMD makes it clear their guidance is not a CEQA threshold, for the purposes of determining cancer risk of placing residences in proximity to DPM sources. The City's selected threshold for the purposes of determining cancer risk of placing residences in proximity to DPM sources is whether lifetime cancer risks are substantially increased as a result of exposure to TACs from mobile sources. The HRA indicates that future residents would not be subject to a substantial increase in lifetime cancer risk as a result of exposure to TACs from mobile sources based on the SMAQMD guidance. It is important to note that all residents of the City and County are exposed to some risk of cancer due to DPM just by virtue of living in an urban environment. Based on the findings of the HRA, the City has determined that the impact would be considered **less than significant**.

Mitigation Measures

None required.

Cumulative Impacts

The cumulative context of an air pollutant is dependent on the specific pollutant being considered. Ozone precursors are a regional pollutant; therefore, the cumulative context would be existing and future development within the entire SVAB. This means that ozone precursors generated in one location do not necessarily have ozone impacts in that area. Instead, precursors from across the region can combine in the upper atmosphere and be transported by winds to various portions of the air basin. Consequently, all ozone precursors generated throughout the air basin are part of the cumulative context.

The geographic scope of the area for the proposed project cumulative analysis includes the City of Sacramento and surrounding areas within the Sacramento Federal Nonattainment Area for ozone. The Sacramento Federal Nonattainment Area includes the counties of Sacramento, Yolo, Solano (partial), Sutter (partial), Placer (except Lake Tahoe Air Basin), and El Dorado (except Lake Tahoe Air Basin). The SMAQMD establishes emissions thresholds for regional emissions.

The issue of global climate change is inherently a cumulative issue as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed project's impact to climate change is addressed only as a cumulative impact.

Regarding assessing future TAC emissions and potential health effects, while traffic on a given roadway would increase over time, motor vehicle emissions tend to decrease over time due to increasingly stringent state and federal air quality regulations and replacement of older vehicles. Neither traffic levels nor emissions can be accurately predicted over the 70-year TAC exposure period assumed in the SMAQMD Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways Roadway

Protocol. Additionally, the Roadway Protocol's evaluation criterion (currently 276 in 1 million) is dependent upon current traffic and emissions data, and without future traffic and emissions data, it is unknown what the future evaluation criterion would be. It is not feasible to conduct an analysis of cumulative conditions, as that analysis would include yet-to-be realized emissions reductions, speculative traffic levels, and an inaccurate evaluation criterion. For these reasons, an analysis of future or cumulative conditions is not addressed. This also applies to the analysis of future locomotive emissions.

4.1-7: The proposed project could impede the City or state efforts to meet AB 32 standards for the reduction of greenhouse gas emissions or conflict with the City's Climate Action Plan. Based on the analysis below the impact is *less than significant*.

Construction of the proposed project would result in short-term GHG emissions through the use of construction equipment, off-site trucks hauling construction materials, and worker trips. Operation of the proposed project would result in GHG emissions from vehicular traffic, area sources (natural gas combustion, landscaping), electrical generation, water supply, and solid waste generation. As a qualifying residential project consistent with the SCS, the analysis of GHG emissions from automobiles and light trucks is not required. Nevertheless, these emissions have been quantified in Table 4.1-10 below to provide the reader with additional information.

The City's CAP establishes requirements for projects to reduce a portion of their estimated GHG to assist the City in meeting state requirements to reduce GHG emissions in compliance with state law. The CAP includes a checklist to demonstrate compliance with the CAP. As shown in the completed CAP Checklist in Appendix G and discussed above, the proposed project would meet the City's CAP requirements and therefore would not conflict with the City's CAP.

The City adopted a CAP in February 2012 that establishes requirements for projects to reduce a portion of their estimated GHG emissions to assist the City in meeting state requirements to reduce GHG emissions. The proposed project must comply with the 2030 General Plan policies as well as the 2035 MTP (SACOG has determined the project is consistent with the 2035 MTP) and AB 32. The City's CAP is designed to implement the policies contained in the 2030 General Plan to reduce GHG emissions within the City. To address consistency with the CAP, the City requires applicants for projects that are not exempt from CEQA to complete the CAP Consistency Checklist form. A copy of the completed form for this project is included in Appendix G. The project is consistent with the City's CAP and meets the City's requirements to reduce its contribution to GHG emissions through a variety of measures including:

- The project location supports a VMT of less than 15.9 based on the City of Sacramento Residential Daily VMT/Capita map;

- The project will include traffic calming measures including traffic circles, bulb outs, and split medians;
- The project includes sidewalks on both sides of the street and street lighting and provides bicycle facilities consistent with the Bikeway Master Plan; and
- The project would exceed Title 24 energy efficiency requirements that will be in effect as of January 2014 by 10%.

Therefore, the project would have a **less-than-significant impact** related to attainment of the AB 32 standards.

To provide a full understanding of the proposed project's potential contribution to climate change, the GHG emissions associated with construction and operation of the proposed project are provided in Table 4.1-10. In accordance with the City's CAP, new structures built as part of the proposed project would exceed Title 24 energy standards in effect in 2014 by 10%. This project feature was applied as a mitigation measure in the CalEEMod modeling, and is reflected in the Mitigated Emissions column in Table 4.1-10 below.

Table 4.1-10
Project Generated Annual GHG Emissions - MTCO₂e

Emission Source and Year	Unmitigated Emissions	Mitigated Emissions
Construction 2014	722.43	721.62
Construction 2015	1,917.20	1,915.10
Construction 2016	1,887.31	1,885.24
Construction 2017	1,727.87	1,725.97
Operations (2018)		
Area Sources	150.37	150.37
Energy Usage	1,225.89	1,054.93
Mobile Sources	3,841.99	3,841.99
Solid Waste	111.42	111.42
Water and Wastewater	61.77	61.76
Total Operational	5,391.43	5,220.46

Source: See Appendix B.

As described in the General Plan MEIR Mitigation Monitoring Plan, Attachment 1: 2030 General Plan – Policies and Implementation Measures that Mitigate Climate Change, there are several General Plan goals, policies, and implementation measures that would mitigate the effects of climate change. Promoting infill development (Policies LU 1.1.4, LU 1.1.5, and LU 2.6.2), orienting buildings toward the street to engage and complete the public realm (Policy LU 2.7.7), and having multi-modal access to commercial areas (Policy M 1.2.3) are examples of policies

included in the General Plan that apply to the proposed project and would reduce GHG emissions. Pursuant to these policies, the proposed project would be an infill project with multi-modal access (i.e., walking, biking, and public transit) to commercial land uses on Alhambra Boulevard, J Street, and (via public transit) into Midtown and Downtown Sacramento.

Furthermore, in addition to the six CAP Consistency Review Checklist questions, the proposed project would be consistent with other CAP Strategies, including but not limited to Strategy 1 (Sustainable Land Use) Measures 1 and 2. Measure 1 focuses on promoting sustainable growth patterns and infill development; development of the project site would be considered infill development as discussed in Chapter 3 Land Use, Planning and Population of this EIR. Measure 2 focuses on creating complete neighborhoods. The proposed project is near residential land uses to the south, southwest and southeast, and proximate to commercial land uses to the south along Alhambra Avenue and C Street, and office uses to the south along C Street. Adding additional residential land uses could allow more opportunities for non-motorized shopping trips (i.e., walking or biking) and/or reduce VMT for shopping trips in the immediate area. In addition, proximate to the project site are three bus routes: Route 34, Route 67, and Route 68. All three of these routes have stops located to the south of the project site. The closest stop to the project site serves Route 34, and is located just over a quarter mile south of the proposed bicycle/pedestrian underpass (if approved by UPRR) at the intersection of E Street/Alhambra Boulevard). This bus line connects to light rail in Downtown at the St. Rose of Lima Park light rail station (7th/K), 8th/O light rail station, and the 8th/K light rail station. Therefore, residents have an option of using public transit to access the larger Sacramento region (i.e., light rail) from the project site.

The City's CAP Strategy 1 Measures 3 and 4 focus on increased bicycle and transit mode share, respectively. The proposed project, with its proximity to commercial land uses and transit stops, and the construction of pedestrian and bicycle facilities onsite and connections from the onsite facilities to existing offsite facilities would allow future residents to utilize alternative modes of transportation for work and shopping. Access to alternative modes of transportation would reduce the number of vehicle trips to the project site. Finally, the new residential construction would comply with all the basic energy requirements with respect to design and efficiency set forth in the City of Sacramento building code.

In addition, as noted above, the project was determined by SACOG to be consistent with the SCS, therefore the EIR "shall not be 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." (Public Resources Code Section 21159.28(a).) However, for the purposes of disclosure this information and analysis has been included.

Therefore, the proposed project is consistent with the City's CAP with respect to planning and land use strategies and the impact is **less than significant**.

Mitigation Measures

None required.

4.1-8: The proposed project could result in a cumulatively considerable net increase of any criteria pollutant for which the project area is in non-attainment under an applicable federal or state ambient air quality standard (including the release of emissions that exceed quantitative thresholds for ozone precursors). Based on the analysis below the impact is *less than significant*.

Due to its nonattainment status for the federal and state ozone standards, the geographic scope of the area for the proposed project cumulative analysis includes the City of Sacramento and surrounding areas within the Sacramento Federal Nonattainment Area (SNFA) for ozone. The SNFA includes the counties of Sacramento, Yolo, Solano (partial), Sutter (partial), Placer (except the Lake Tahoe Air Basin), and El Dorado (except the Lake Tahoe Air Basin).

As discussed above, the SFNA is in nonattainment for O₃ and particulate matter. Ongoing development and operation of new land uses would generate additional emissions of O₃ precursors and particulate matter, which may adversely affect the ability of the region to achieve attainment with the applicable air quality standards. This is a significant cumulative impact.

As discussed in the Regulatory Framework above, regional air quality plans have been prepared to identify strategies to achieve attainment of the ambient air quality standards. New development in the SFNA that results in greater air pollutant emissions than was assumed in regional air quality plans could contribute to cumulative air quality impacts. However, the proposed project is within the region's urban growth boundary; development within the urban growth boundary is considered by the SMAQMD to be consistent with the regional air quality plans (Hurley, pers. comm. 2012)

The SMAQMD Guide to Air Quality Assessment describes cumulative air quality issues as follows:

By its very nature, air pollution is largely a cumulative impact. Ambient air quality standards are violated or approach nonattainment levels due to past development that has formed the urban fabric, and attainment of standards can be jeopardized by increasing emissions-generating activity in the region. The nonattainment status of regional pollutants is a result of past and present development within the SVAB. Thus, this regional impact is a cumulative impact, and projects would contribute to this impact only on a cumulative basis. No single

project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects.

Given this background, the SMAQMD Guide to Air Quality Assessment describes a step-by-step approach to evaluating a project's contribution to cumulative impacts. The following discussion evaluates the potential for the proposed project's construction and operational emissions to result in a considerable contribution to the region's cumulative air quality impact.

Ozone Precursor Emissions

Construction: In accordance with the SMAQMD guidance, a project whose construction emissions would not exceed the NO_x significance threshold would not be considered cumulatively considerable and would be less than significant. As discussed in Impact 4.1-1, the project's NO_x construction emissions would exceed the threshold without further mitigation. The project applicant, however, will pay the SMAQMD construction NO_x mitigation fee to reduce the construction emissions to less than significant. Under the SMAQMD guidance, with this mitigation, the project's emissions of O₃ precursors would not be considerable and the project's contribution to the cumulative impact would be less than significant.

Operation: In accordance with the SMAQMD guidance, a project whose operational emissions would not exceed the NO_x or ROG significance thresholds would not be considered cumulatively considerable and would be less than significant. As discussed in Impact 4.1-2, the project operation would not generate NO_x or ROG emissions that exceed the threshold of significance. Therefore, the project's emissions of ozone precursors would not be considerable and the project's contribution to the cumulative impact would be less than significant.

Particulate Matter Emissions

The proposed project would generate PM₁₀ and PM_{2.5} emissions during construction but these would be kept below the level of significance because the project would disturb less than 15 acres per day and would implement SMAQMD's Basic and Enhanced Emission Control Practices. In accordance with SMAQMD guidance, if these criteria are met, the project's PM₁₀ and PM_{2.5} emissions would not be considered cumulatively considerable and the project's contribution would be **less than significant**.

In addition, the SMAQMD guidance considers whether construction activity would occur in proximity to sensitive receptors. As discussed in Impact 4.1-5, the project's construction would occur near sensitive receptors. However, as discussed in Impact 4.1-3, the construction emissions of PM₁₀ and PM_{2.5} would not result in a substantial contribution to the

AAQS based on the SMAQMD screening criteria. In accordance with the SMAQMD guidance, the project would not be considered cumulatively considerable and the project's contribution would be **less than significant**.

Mitigation Measures

None required.

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