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## 3.1 - Air Quality

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### 3.1.1 - Summary

This section describes the existing air quality and climate change conditions and potential effects from project implementation on the incorporation area, the surrounding area, and global climate.

### 3.1.2 - Environmental Setting

This section discusses meteorological conditions, including temperature, precipitation, and wind. Meteorology is the study of weather and climate. Weather refers to the state of the atmosphere at a given time and place with regard to temperature, air pressure, humidity, cloudiness, and precipitation. The term weather refers to conditions over short periods; conditions over long periods, generally at least 30 to 50 years, are referred to as climate. Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

#### **Sacramento Valley Air Basin**

The project is located within the Sacramento Valley Air Basin (SVAB), a large north-south-oriented valley in Northern California. The SVAB is generally shaped like a bowl. It is open in the south and is surrounded by mountain ranges on all other sides. The Sierra Nevada Mountains form the eastern border of SVAB, and the Coastal Ranges are located along the western boundary of the SVAB.

The SVAB encompasses 11 counties, including Shasta, Tehama, Glenn, Colusa, Yolo, Butte, Yuba, Sutter, and Sacramento. The SVAB also includes the northeastern half of Solano County and the western portion of Placer County. The SVAB is further divided into two planning areas: the Broader Sacramento Area that consists of the southern (more populated) portion of the SVAB, and the Upper Sacramento Valley. The project is located in the Broader Sacramento Area portion of the SVAB.

#### **Transport**

Transport is the term used to describe the flow of air pollutants from one geographic area to another. The project area is considered both a contributor and recipient of transported air pollutants. The air quality in the Broader Sacramento Area can be impacted by ozone precursors generated in the San Francisco Bay Area, and on occasion, by pollutants transported from the San Joaquin Valley. However, local emissions dominate the inventory of air pollution on hot, stagnant summer days. (CARB 2001).

#### **Climate and Meteorology**

The climate in the Sacramento Valley area is classified as Mediterranean, with mild, wet winters and warm, dry summers. The major climatic controls are the Pacific High Pressure System over the eastern Pacific Ocean and the local topography. The formation of a high-pressure area over the Great

Basin Region to the east of the Sierra Nevada also affects the meteorology of the Sacramento Valley area, primarily during the winter months.

The Pacific High Pressure System is a semi-permanent, subtropical, high-pressure system located off the Pacific Coast. The size and strength of the Pacific High Pressure System varies seasonally. By varying degrees, weather in the summer, spring, and fall is generally a result of the movement and intensity of the Pacific High Pressure System. During the summer, its size and strength is at a maximum and the regional climate is dominated by its influence. As a result, clear skies with intense solar heating occur over California's interior, forming a thermal trough of low pressure. This low-pressure trough intensifies the prevailing northwesterly flow over the area. Little precipitation occurs during the summer because the Pacific High Pressure System blocks migrating extra-tropical weather systems.

As the Pacific High Pressure System shifts southward during the fall, its dominance over the area diminishes. During the winter, three weather regimes generally prevail:

1. Storm periods characterized by cloudiness, precipitation, and shifting, gusty winds.
2. Clear weather associated with either a buildup of pressure over the interior of California or the influence of a well-developed Great Basin High pressure system.
3. Persistent fog or stratus clouds and temperature inversions associated with a weak influence of the Great Basin High, trapping a layer of cool, moist air in the interior valleys.

Thus, sky cover, temperature, and humidity conditions are much more variable during the winter. Air movement is also variable, with stagnant conditions occurring more frequently than during the summer months.

The prevailing wind in this area is southerly all year. This is due to the north-south orientation of the valley and the deflecting effects of the towering Sierra Nevada on the prevailing oceanic wind that moves through the Carquinez Strait near the Delta, at the junction of the Sacramento and San Joaquin rivers. This phenomenon causes what is locally termed the "delta breeze." No other tidewater gap exists in the Coastal Mountains to admit significant marine air into the Sacramento or the San Joaquin Valleys.

Occasionally, a strong north or northeasterly barometric pressure gradient develops, forcing air south or southwestward down the Siskiyou Mountains or the Sierra Nevada. This air is warmed by compression as it descends, reaching the valley floor as a hot, dry north wind. Heat waves in the summer are produced by these winds and fortunately, are usually followed within 2 or 3 days by the normally cool, southwest delta breezes, especially at night.

The vertical mixing of air pollutants is limited by the presence of persistent temperature inversions. A temperature inversion is a meteorological phenomenon where air temperature increases with

height. Usually, within the lower atmosphere (the troposphere), the air near the surface of the Earth is warmer than the air above it, largely because the atmosphere is heated from below by solar radiation absorbed at the surface. Sometimes the gradient is inverted, so that the air gets colder nearer the surface of the Earth: this is a temperature inversion.

Inversions may be either at ground level or elevated. Ground-level inversions occur frequently during early fall and winter (i.e., October through January). High concentrations of primary pollutants, which are those emitted directly into the atmosphere (e.g., carbon monoxide), may be found at these times. Elevated inversions act as a lid over the SVAB and limit vertical mixing. Severe air stagnation occurs as a result of these inversions. Elevated inversions contribute to the occurrence of high levels of ozone during the summer months.

Summers are usually dry with warm to hot afternoons and mostly mild nights. The rainy season generally is from November through March. About 75 percent of the annual precipitation occurs then, but measurable rain falls only on an average of 9 days per month during that period. The shielding effect of mountains to the north, east, and west usually modifies winter storms.

Topographic effects, the north-south alignment of the valley, the coast range, and the Sierra Nevada strongly influence the wind flow in the project area. A sea-level gap in the Coast Range allows cool, oceanic air to flow occasionally into the valley during the summer season, with a marked lowering of temperature through the Sacramento-San Joaquin River Delta to the capital. In the spring and fall, a large north-to-south pressure gradient develops over the northern part of the State. Air flowing over the Siskiyou Mountains to the north warms and dries as it descends to the valley floor. Winter storms can bring strong, southerly winds.

Arden Arcade's proximity to the Pacific Ocean and location within the Sacramento Valley are the greatest influences on temperature variability in the project area. The nearest weather station to the incorporation area is the Sacramento Executive Airport, approximately 6.5 miles southwest. For the period of record (1941 to 2007) average daytime maximum temperatures in the summer (June, July, August) was 91 degrees Fahrenheit (°F), whereas the average wintertime (December, January, February) daytime maximum was only 56°F. Nighttime minimum temperatures in the summer are 57°F and the nighttime minimum temperatures in the winter are 39°F. The summer months have an average of 52 days in which the maximum temperature is equal to or greater than 90°F. The winter months have an average 16 days in which the minimum temperature is equal to or less than 32°F. Hot spells can occur from May through October, with temperatures exceeding 100°F, and are typically caused by airflow from sub-tropical, high-pressure areas that bring light to nearly calm winds and humidity below 20 percent (WRCC 2007).

Annual average rainfall is approximately 17 inches, with almost 89 percent of rain falling between the months of November and April. Rainfall during these months is primarily due to winter storms. Thunderstorms are few in number, usually mild in character, and occur mainly in the spring. An

occasional thunderstorm may drift over the valley from the Sierra Nevada in the summer. Snow falls so rarely, and in such small amounts, that its occurrence may be disregarded as a climatic feature. Heavy fog occurs mostly in mid-winter, rarely in summer, and seldom in spring or fall. The fog may last several days if stagnant atmospheric conditions are present (WRCC 2007).

Winds in the impacted area are seasonally influenced. The prevailing wind is from the south, primarily because of marine breezes through the Carquinez Strait; although during winter, the sea breezes diminish and winds from the north occur more frequently. Winter storms, however, can bring strong southerly winds. Between late spring and early fall, a layer of warm air often overlays a layer of cool air from the Delta and San Francisco Bay, resulting in an inversion. Typical winter inversions are formed when the sun heats the upper layers of air, trapping below them air that has been cooled by contact with the colder surface of the Earth during the night. Although each inversion type predominates at certain times of the year, both types can occur at any time of the year. Local topography produces many variations that can affect the inversion base and thus influence local air quality.

## **Regional Air Quality**

### ***Background***

An emissions inventory is an account of the amount of air pollution generated by various emissions sources. To estimate the sources and quantities of pollution, the California Air Resources Board (CARB), in cooperation with local air districts and industry, maintains an inventory of California emission sources. Sources are subdivided into the four major emission categories: mobile, stationary, areawide, and natural sources.

Mobile sources include on-road sources and off-road mobile sources. The on-road emissions inventory, which includes automobiles, motorcycles, and trucks, is an estimation of population, activity, and emissions of the on-road motor vehicles used in California. The off-road emissions inventory is an estimate of the population, activity, and emissions of various off-road equipment, including recreational vehicles, farm and construction equipment, lawn and garden equipment, forklifts, locomotives, commercial marine ships, and marine pleasure craft. CARB staff estimates mobile source emissions with assistance from districts and other government agencies.

Stationary sources are large, fixed sources of air pollution, such as power plants, refineries, and manufacturing facilities. Stationary sources also include aggregated point sources. These include many small point sources, or facilities, that are not inventoried individually but are estimated as a group and reported as a single-source category. Examples include gas stations and dry cleaners. Each of the local air districts estimates the emissions for the majority of stationary sources within its jurisdiction. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location.

Areawide sources include source categories associated with human activity, and these emissions take place over a wide geographic area. Consumer products, fireplaces, farming operations (such as tilling), and unpaved road dust are examples of areawide sources. CARB and local air district staffs estimate areawide emissions. Emissions from areawide sources may be either from small, individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products and dust from unpaved roads.

Natural, or non-anthropogenic, sources include source categories with naturally occurring emissions such as geogenic (e.g., petroleum seeps), wildfires, and biogenic emissions from plants. CARB staff and the air districts also estimate natural sources.

**Sacramento County Emissions Inventory**

The 2008 emissions inventory for Sacramento County is available in CARB’s 2009 Almanac Emission Projection Data. Table 3.1-1 summarizes the estimated 2008 emissions for the main pollutants of concern in the Sacramento County.

**Table 3.1-1: 2006 Sacramento County Emissions Inventory**

Emission Category	Tons per Day			
	ROG	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Stationary Sources	8.1	3.9	1.5	0.9
Areawide Sources	17.3	3.1	39.4	10.1
Mobile Sources	35.6	69.0	3.5	2.8
Natural Sources	10.2	0.0	0.0	0.0
Total Sacramento County	71.2	76.0	44.4	13.8
Source: CARB 2009a.				

**ROG.** Mobile sources contributed approximately 50 percent of the 2008 reactive organic gases (ROG) emissions, with on-road motor vehicle emissions constituting the majority of the mobile emissions. Areawide sources accounted for approximately 24 percent of the 2008 emissions inventory.

**NO<sub>x</sub>.** Mobile sources generated the majority of oxides of nitrogen (NO<sub>x</sub>) emissions in Sacramento County at approximately 91 percent of the total NO<sub>x</sub> inventory.

**PM<sub>10</sub>.** For particulate matter smaller than 10 microns in diameter (PM<sub>10</sub>), areawide sources contributed more almost 90 percent of the 2008 inventory. The main PM<sub>10</sub>-generating areawide sources include unpaved road dust, paved road dust, and construction and demolition.

**PM<sub>2.5</sub>.** Areawide sources contributed more than 70 percent of the 2008 inventory of particulate matter smaller than 2.5 microns in diameter (PM<sub>2.5</sub>), and mobile sources generated approximately 20

percent of the inventory. The main PM<sub>2.5</sub>-generating areawide sources include residential fuel combustion and paved road dust.

### Local Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. The SMAQMD and the CARB operate monitoring stations throughout Sacramento County. Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the incorporation area. The SMAQMD operates the two air monitoring stations in the Arden Arcade incorporation area. The Del Paso Manor Site is on Avalon Drive in Sacramento, and the El Camino Site is on the corner of Watt Avenue and El Camino Avenue. The Del Paso Manor Site monitors ozone, CO, PM<sub>10</sub>, and PM<sub>2.5</sub>, as well as SO<sub>2</sub> and NO<sub>2</sub>. The El Camino Site monitors CO. Table 3.1-2 summarizes 2004 to 2006 published monitoring data. The data shows that the number of days over the 1-hour state ozone standard, the 8-hour federal ozone standard, and the number of days over the PM<sub>10</sub> and PM<sub>2.5</sub> state and federal standards were higher in 2005 and 2006.

CO standards have not been exceeded. In fact, the El Camino Site was set up as an intersection emulating CO hotspot analyses. The CO monitor is located only 10 feet from the intersection, which is the approximate receptor distance used in most modeling analyses. Real-time data has been collected, analyzed, and verified at this intersection since 1978. This intersection was chosen for a microscale CO monitor because it is a busy intersection in a large populated area.

**Table 3.1-2: Local Air Quality Monitoring (Del Paso Manor Station)**

Air Pollutant, Averaging Time (Units)	2006	2007	2008
<b>Ozone</b>			
Max 1 Hour (ppm)	0.125	0.138	0.113
Days > CAAQS (0.09 ppm)	18	6	17
Max State 8 Hour (ppm)	0.102	.116	0.097
Days > CAAQS (0.07 ppm)	35	16	23
Days > NAAQS (0.08 ppm)	24	10	18
<b>Particulate matter (PM<sub>10</sub>)</b>			
State Annual Average (µg/m <sup>3</sup> )	24.7	20.7	23.3
National Annual Average (µg/m <sup>3</sup> )	24.1	19.6	22.2
Max State 24 Hour (µg/m <sup>3</sup> )	67.0	75.0	72.0
Max National 24 Hour (µg/m <sup>3</sup> )	63.0	70.0	71.0
Estimated Days > CAAQS (50 µg/m <sup>3</sup> )	7	5	2
Estimated Days > NAAQS (150 µg/m <sup>3</sup> )	0	0	0
<b>Fine particulate matter (PM<sub>2.5</sub>)</b>			
State Annual Average (µg/m <sup>3</sup> )	15.2	12.3	18.9
National Annual Average (µg/m <sup>3</sup> )	13.1	12.3	13.2

**Table 3.1-2 (cont.): Local Air Quality Monitoring (Del Paso Manor Station)**

Air Pollutant, Averaging Time (Units)	2006	2007	2008
Max State 24 Hour ( $\mu\text{g}/\text{m}^3$ )	78.0	61.0	93.1
Max National 24 Hour ( $\mu\text{g}/\text{m}^3$ )	78.0	61.0	74.4
Estimated Days > NAAQS ( $65 \mu\text{g}/\text{m}^3$ )	19.3	26.1	24.1
<b>Carbon monoxide</b>			
Max 1 Hour (ppm)*	4.99	4.14	3.56
Max 8 Hour (ppm)	3.49	2.90	2.49
Days > CAAQS (9.0 ppm)	0	0	0
Days > NAAQS (9 ppm)	0	0	0
Abbreviations: > = exceed      ppm = parts per million $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard Mean = Annual Arithmetic Mean NA = Not applicable (standard not in effect) <sup>1</sup> From the California measurement. * The CARB does not report 1-hour average CO concentrations in its database, only 8-hour CO concentrations. Therefore, the 1-hour CO concentration was derived by dividing the 8-hour concentration by 0.7. Source: CARB 2009b.			

**Table 3.1-3: Local Air Quality Monitoring (El Camino Station)**

Air Pollutant, Averaging Time (Units)	2004	2005	2006
<b>Carbon monoxide</b>			
Max 1 Hour (ppm)*	5.99	4.57	4.06
Max 8 Hour (ppm)	4.19	3.20	2.84
Days > CAAQS (9.0 ppm)	0	0	0
Days > NAAQS (9 ppm)	0	0	0
Abbreviations: > = exceed      ppm = parts per million $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard Mean = Annual Arithmetic Mean NA = Not applicable (standard not in effect) <sup>1</sup> From the California measurement. * The CARB does not report 1-hour average CO concentrations in its database, only 8-hour CO concentrations. Therefore, the 1-hour CO concentration was derived by dividing the 8-hour concentration by 0.7. Source: CARB 2009b.			

**Local Sources of Air Pollution**

*Mobile Sources*

The latest 2006 traffic counts (SacDOT 2007) for the intersection show that Watt Avenue north of El Camino had 53,8410 vehicles per day (vpd) and south of El Camino had 55,841 vpd. Additionally, El Camino had 21,478 vpd east of Watt and 24,496 vpd west of Watt. In spite of the activity of this intersection, the maximum daily 8-hour CO averages have steadily declined over the years. The last exceedance of the federal 8-hour CO standard was in 1991 (12.25 ppm). Since that year, CO

concentrations have decreased steadily until, in 2008, Table 3.1-2 shows the measured CO 8-hour average concentration (2.84 ppm) was less than one-half the state and federal CO standards of 9 ppm.

There are no rail lines or rail yards in the project area. However, the heavy rail operators within the County consist of the Union Pacific Railroad (UPRR), Burlington Northern Santa Fe (BNSF), and Amtrak. The UPRR is located approximately 1,000 feet northwest of the proposed incorporation area.

#### *Odors*

The SMAQMD provides the following examples of sources of odor in its 2004 Guide to Air Quality Assessment: agriculture, wastewater treatment, food processing, chemical plants, composting, landfills, dairies, and rendering plants. The proposed incorporation area does not contain any dairies, landfills, rendering plants, or wastewater treatment plants. In addition, the proposed incorporation area does not contain substantial amounts of food processing, chemical plants, or composting facilities.

#### *Sensitive Receptors*

Certain populations, such as children, the elderly, and persons with preexisting respiratory or cardiovascular illness, are particularly sensitive to the health impacts of air pollution. Some individuals more severely impacted by air pollution than others, usually because of pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants.

Residential areas are considered sensitive to poor air quality because people are often at home for extended periods and their exposure can be high. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise places a high demand on cardio-vascular function. People in industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, with most workers spending the majority of their time indoors.

The project contains existing residences throughout the proposed incorporation area, as well as 11 elementary schools, two middle schools, three high schools, one special education high school, two special education school programs, and multiple parks. More information about schools and parks within the proposed incorporation area is provided in the Criteria Air Pollutants discussion in Section 3-8, Public Services.

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions).



## **Ozone**

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROG and NO<sub>x</sub>, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem, and often the effects of the emitted ROG and NO<sub>x</sub> are felt a distance downwind of the emission sources. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses such as pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated \$500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

## **Carbon Monoxide (CO)**

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart

failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

#### **Respirable Particulate Matter ( $PM_{10}$ and $PM_{2.5}$ )**

Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small; they can only be detected using an electron microscope.

Particle pollution includes inhalable coarse particles, with diameters smaller than 10 micrometers and fine particles, with diameters that are 2.5 micrometers and smaller. For reference,  $PM_{2.5}$  is approximately one-thirtieth the size of the average human hair.

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere between such chemicals as sulfur dioxides ( $SO_x$ ) and  $NO_x$ , which are emitted from power plants, industries, and automobiles. These particles, known as secondary particles, make up most of the fine particulate pollution in the country.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures to particles

(hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposure has been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

### **Other Criteria Air Pollutants**

The standards for NO<sub>2</sub>, SO<sub>2</sub>, and lead are being met within the region, and trends in historical data of ambient concentrations of these pollutants show no signs of violating state or federal standards in the future.

### **Toxic Air Contaminants**

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulate matter (DPM), benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

Toxic air contaminants are less pervasive in the urban atmosphere than criteria air pollutants, but they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

### **Greenhouse Gases**

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). The effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit GHGs. The presence of GHGs in the atmosphere affects the Earth's temperature. Without the natural heat-trapping effect of GHGs, the Earth's surface would be about 34°C cooler (CAT 2006). However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. Some greenhouse gases can remain in the atmosphere for hundreds of years.

The global warming potential (GWP) is the potential of a gas or aerosol to trap heat in the atmosphere. The GWP of a gas is essentially a measurement of the greenhouse gas compared with

the reference gas, carbon dioxide; carbon dioxide has a GWP of one. The GHGs of concern from the project are summarized in Table 3.1-4.

Individual GHG compounds have varying GWP and atmospheric lifetimes. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent metric. Methane's warming potential of 21 indicates that methane has a 21 times greater warming affect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual GHG multiplied by its GWP.

**Table 3.1-4: Greenhouse Gases**

Greenhouse Gas	Description and Physical Properties	Sources
Water vapor	Water vapor is the most abundant, important, and variable GHG. In the atmosphere, it maintains the climate necessary for life.	Sources include evaporation from the ocean and other water bodies, sublimation of ice and snow, and transpiration from plants.
Ozone (O <sub>3</sub> )	Ozone is a short-lived local GHG and photochemical pollutant. Tropospheric ozone changes contribute to radiative forcing on a global scale. GWPs for short-lived GHGs, such as ozone and aerosols, are not defined by the IPCC.	Ozone is formed from reactions of ozone precursors (nitrogen oxides [NO <sub>x</sub> ] and volatile organic compounds [VOC]) and sunlight in the atmosphere. VOC and NO <sub>x</sub> are emitted from automobiles, solvents, and fuel combustion.
Aerosols	Aerosols are particulate matter suspended in the air. They are short-lived and remain in the atmosphere for about a week. Aerosols warm the atmosphere by absorbing heat and cool the atmosphere by reflecting light, with radiative forcing (RF) cooling effects of $-1.2 \text{ Wm}^{-2}$ . There is a low scientific understanding of the RF of individual aerosols, such as black carbon. Black carbon can cause warming from deposition on snow ( $+0.1 \text{ Wm}^{-2}$ ) and from suspensions in air ( $+0.2 \text{ Wm}^{-2}$ ). A GWP of 761 for black carbon has been identified in a journal article. Global cooling potentials for other aerosols in a metric similar to the GWP are not available.	Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning and incomplete combustion of fossil fuels (such as diesel fuel).
Methane (CH <sub>4</sub> )	Methane is a flammable gas and is the main component of natural gas. GWP = 21.	A natural source of methane is from the anaerobic decay of organic matter. Methane is extracted from geological deposits (natural gas fields). Other sources are from landfills, fermentation of manure, and cattle.

**Table 3.1-4 (cont.): Greenhouse Gases**

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide (N <sub>2</sub> O)	Nitrous oxide is also known as laughing gas and is a colorless GHG. GWP = 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Carbon dioxide (CO <sub>2</sub> )	Carbon dioxide is an odorless, colorless, natural GHG. GWP = 1.	Carbon dioxide is emitted from natural and anthropogenic sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. The concentration in 2005 was 379 ppm, which is an increase of about 1.4 ppm per year since 1960.
Chlorofluorocarbons (CFCs)	CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the Earth's surface). GWPs range from 3,800 to 8,100.	CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, the Montreal Protocol on Substances that Deplete the Ozone Layer stopped their production in 1987.
Hydrofluorocarbons (HFCs)	The HFCs with the largest measured atmospheric concentrations are HFC-23 and HFC-134a (10 ppt) and HFC-152a (1 ppt). GWPs: HFC-23 = 11,700, HFC-134a = 1,300, HFC-152a = 140.	HFCs are synthetic manmade chemicals that are used as a substitute for CFCs in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons (PFCs)	PFCs have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. GWPs range from 6,500 to 9,200.	Two main sources of PFCs are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. Concentrations in the 1990s were about 4 ppt. It has the highest GWP of any gas evaluated, 23,900.	It is human-made and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
<p>Notes: ppm = parts per million; ppt = parts per trillion (measure of concentration in the atmosphere) GWP = global warming potential Source: IPCC 2007a.</p>		

**Emissions Inventories and Trends***International, National, and State*

In 2004, total worldwide greenhouse gas emissions were estimated to be 20,135 million MTCO<sub>2</sub>e, excluding emissions/removals from land use, land use change, and forestry. In 2004, greenhouse gas emissions in the U.S. were 7,074.4 million MTCO<sub>2</sub>e.

California is the second largest contributor in the U.S. of GHGs and the sixteenth largest in the world (CEC 2006). In 2004, California produced 500 MMTCO<sub>2</sub>e (CEC 2007), including imported electricity and excluding combustion of international fuels and carbon sinks or storage, which is approximately 7 percent of U.S. emissions. The major source of GHGs in California is transportation, contributing 41 percent of the State's total GHG emissions (CEC 2006). Electricity generation is the second largest source, contributing 22 percent of the State's GHG emissions (CEC 2006). The inventory for California's GHG emissions between 2000 and 2006 is presented in Table 3.1-5.

**Table 3.1-5: California GHG Inventory 2000-2006**

Main Sector*	Emissions MMTCO <sub>2</sub> e						
	2000	2001	2002	2003	2004	2005	2006
Agriculture & Forestry	20.91	21.12	24.34	24.48	24.78	25.20	26.25
Commercial	12.98	12.58	14.46	13.07	13.15	12.97	13.25
Electricity Generation (Imports)	42.97	52.38	50.61	56.29	58.59	54.92	49.92
Electricity Generation (In State)	60.76	64.66	51.56	49.77	58.08	52.45	56.99
Industrial	107.93	105.47	107.44	106.41	100.99	100.51	103.00
Not Specified	8.75	9.60	10.47	11.33	12.20	12.90	13.52
Residential	32.20	30.45	30.22	29.88	31.54	30.94	31.12
Transportation	171.94	174.62	181.32	178.90	183.03	185.82	185.77
Total	458.45	470.89	470.42	470.12	482.35	475.70	479.80
Notes: * Excludes Military Sector. Source: CARB 2009c.							

*Local Inventory*

The Sacramento County Department of Environmental Review and Assessment (DERA), with the assistance of Jones and Stokes, developed a 2005 greenhouse gas (GHG) inventory for the unincorporated areas of Sacramento County. The inventory defines a baseline emissions level from which Sacramento County can begin to quantify emissions reduction efforts in order to comply with Assembly Bill 32 (AB 32) goals. The inventory also identifies the largest contributing sectors to GHG emissions. The emissions inventory for the unincorporated area includes emissions from the Arden Arcade Community Plan area; however, the inventory does not detail emissions for the

proposed incorporation area or the Arden Arcade Community Plan area. Table 3.1-6 contains the community emissions inventory for all unincorporated areas of Sacramento County.

**Table 3.1-6: 2006 Sacramento County Emissions Inventory**

Emission Source	Greenhouse Gas Emissions	
	Tons CO <sub>2</sub> e	Percentage of Inventory
Residential	748,792	16.4
Commercial	1,005,060	22.1
Industrial	29,223	0.6
Transportation	1,942,412	42.7
Waste	364,904	8.0
Other	462,659	10.2
Total	4,553,051	100.0
Source: DERA, 2009.		

**Potential Environmental Effects**

Worldwide, average temperatures are likely to increase by 1.8 °C to 4°C, or approximately 3°F to 7°F by the end of the 21st century (IPCC 2007a). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependent on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the IPCC’s Working Group II Report, climate change impacts to North America may include diminishing snowpack, increasing evaporation, exacerbated shoreline erosion, exacerbated inundation from sea level rising, increased risk and frequency of wildfire, increased risk of insect outbreaks, increased experiences of heat waves, and rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations (IPCC 2007b).

For California, climate change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

- Reduced precipitation
- Changes to precipitation and runoff patterns
- Reduced snowfall (precipitation occurring as rain instead of snow)
- Earlier snowmelt
- Decreased snowpack
- Increased agricultural demand for water
- Intrusion of seawater into coastal aquifers
- Increased agricultural growing season
- Increased growth rates of weeds, insect pests and pathogens
- Inundation of low-lying coastal areas by sea level rise
- Increased incidents and severity of wildfire events
- Expansion of the range and increased frequency of pest outbreaks

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-lying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

### 3.1.3 - Regulatory Setting

Air pollutants are regulated at the national, state, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (CARB) regulates at the state level. The Sacramento Metropolitan Air Quality Management District (SMAQMD) regulates at the air basin level, maintaining ambient air monitoring sites, and regulating stationary sources and indirect sources.

#### Federal and State Regulatory Agencies

The EPA handles global, international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP), conducts research, and provides guidance in air pollution programs, and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act Amendments (CAAA) of 1970. The six criteria pollutants are:

- Ozone
- Particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>)
- Nitrogen dioxide (NO<sub>2</sub>)
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide (SO<sub>2</sub>)

The NAAQS were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

The SIP for the State of California is administered by CARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. An SIP is prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. The SIP incorporates individual federal attainment plans for regional air districts. Federal attainment plans prepared by each air district are sent to CARB to be approved and incorporated into the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring) control measures and strategies and enforcement mechanisms.

CARB also administers California Ambient Air Quality Standards (CAAQS) for the ten air pollutants designated in the California Clean Air Act (CCAA). The ten state air pollutants are the six criteria



pollutants listed above as well as visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The national and state ambient air quality standards are presented in Table 3.1-7.

**Table 3.1-7: Ambient Air Quality Standards**

Air Pollutant	Averaging Time	California Standard	National Standard
Ozone (O <sub>3</sub> )	1 hour	0.09 ppm	—
	8 hour	0.070 ppm	0.075 ppm
Particulate matter (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
	Mean	20 µg/m <sup>3</sup>	—
Particulate matter (PM <sub>2.5</sub> )	24 hour	—	35 µg/m <sup>3</sup>
	Mean	12 µg/m <sup>3</sup>	15.0 µg/m <sup>3</sup>
Carbon monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO <sub>2</sub> )	1 hour	0.18 ppm	—
	Mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO <sub>2</sub> )	1 hour	0.25 ppm	—
	3 hour	—	0.5 ppm
	24 hour	0.04 ppm	0.14 ppm
	Mean	—	0.030 ppm
Lead	30-day	1.5 µg/m <sup>3</sup>	—
	Quarter	—	1.5 µg/m <sup>3</sup>
Sulfates	24 hour	25 µg/m <sup>3</sup>	—
Hydrogen sulfide	1 hour	0.03 ppm	—
Vinyl chloride	24 hour	0.01 ppm	—
Visibility-reducing particles	8 hour	Extinction coefficient of 0.23 per kilometer, visibility of 10 miles or more due to particles when relative humidity is less than 70 percent	—
Abbreviations: ppm = parts per million                      µg/m <sup>3</sup> = micrograms per cubic meter Mean = Annual Arithmetic Mean            30-day = 30-day average                      Quarter = Calendar quarter Source: CARB 2009d.			

In July 1997, EPA promulgated a new 8-hour standard for ozone. As of June 15, 2005, the federal 1-hour standard has been revoked. In setting the 8-hour ozone standard, EPA concluded that replacing the existing 1-hour standard with an 8-hour standard was appropriate to provide adequate and more uniform protection of public health from both short-term (1 to 3 hours) and prolonged (6 to 8 hours) exposures to ozone. While the federal 1-hour ozone standard was officially revoked on

June 15, 2005, the new 8-hour rule also addresses anti-backsliding provisions in the FCAA; so 8-hour ozone nonattainment areas remain subject to control measure commitments that applied under the 1-hour ozone standard.

#### *CARB's Land Use Handbook*

The CARB adopted the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook) in 2005. The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of TACs. The sources of TACs identified in the Land Use Handbook are high traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gas dispensing facilities. If the project involves siting a sensitive receptor or source of TAC discussed in the Land Use Handbook, siting mitigation may be added to avoid potential land use conflicts, thereby reducing the potential for health impacts to the sensitive receptors.

#### **Local Regulatory Agencies**

The specific air pollution control agency for the County of Sacramento is the SMAQMD, but various local, regional, state, and federal government agencies share the responsibility for air quality management in Sacramento County. The SMAQMD operates at the local level, with primary responsibility for attaining and maintaining the national and state ambient air quality standards in Sacramento County. Other local agencies are responsible for the other counties in the larger nonattainment area. The air districts work jointly with the EPA, the CARB, Sacramento Area Council of Governments (SACOG), county transportation and planning departments, cities, and counties, and various non-governmental organizations to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

Sacramento County, as well as some of the counties surrounding it, has been designated “severe” nonattainment for ozone by the EPA. This area is labeled the Sacramento Federal Ozone Nonattainment Area (SFNA). The SMAQMD is not only responsible for achieving federal and state air quality standards to ensure healthy air in Sacramento County; it is also responsible for working with jurisdictions outside of Sacramento County to bring the entire SFNA into compliance.

In addition to state and federal powers to regulate criteria air pollutants, Sacramento County has acknowledged its responsibilities regarding air quality issues by preparing an Air Quality Element for the General Plan. Although the County has no direct regulatory authority over emission sources, it recognizes that land use decisions effect how and where motor vehicles are driven. Because motor vehicles are the largest pollution source in the area, the General Plan lists policy goals and plans that will improve land use and transportation decisions. Table 3.1-8 shows the current status of Sacramento County with the ambient air quality standards.

**Table 3.1-8: Sacramento County Air Quality Attainment Status**

Parameter	California Standard	Federal Standard
Ozone	Nonattainment Classification=Serious	Nonattainment <sup>1</sup> Classification=Serious
Respirable particulate matter (PM <sub>10</sub> )	Nonattainment	Nonattainment <sup>2</sup> Classification=Moderate
Fine particulate matter (PM <sub>2.5</sub> )	Nonattainment	Nonattainment <sup>3</sup>
Carbon monoxide	Attainment for 1-hour and 8-hour standards	Attainment for 1-hour and 8-hour standards
Nitrogen dioxide	Attainment for 1-hour standard	Attainment for annual standard
Sulfur dioxide	Attainment for 1-hour and 8-hour standards	Attainment for 3-hour, 24-hour, and annual standards
Lead	Attainment for 30-day standard	Attainment for calendar quarter standard
Visibility-reducing particles	Unclassified for 8-hour standard	No federal standard
Sulfates	Attainment for 24-hour standard	No federal standard
Hydrogen sulfide	Unclassified for 1-hour standard	No federal standard
<p>Notes:</p> <p><sup>1</sup> The SMAQMD submitted a voluntary request for reclassification from “serious” to “severe” for the 8-hour ozone nonattainment area. EPA action to approve the reclassification request is pending.</p> <p><sup>2</sup> Air quality meets the federal PM<sub>10</sub> standards. However, the SMAQMD must request redesignation and submit a maintenance plan to be formally designated as attainment.</p> <p><sup>3</sup> EPA promulgated a new 24-hour standard for PM<sub>2.5</sub>. The EPA Administrator signed the final PM<sub>2.5</sub> nonattainment designations for Sacramento on October 8, 2009. The designations become effective 30 days after publication in the Federal Register.</p> <p>Source: SMAQMD 2009.</p>		

**Voluntary Federal Reclassification Request**

On February 14, 2008, the five air districts that constitute the Sacramento Region requested CARB to submit a formal request to EPA to reclassify the area from “serious” to “severe” nonattainment for the federal 8-hour ozone standard, with an associated attainment deadline of June 15, 2019. The request is based on an evaluation of the emission reductions necessary to attain the federal standard, and the emission reductions associated with feasible rules. It was determined that the Sacramento Region would not be able to achieve the necessary emission reduction in the existing attainment timeframe through the existing suite of feasible rules.

**Air Quality Plans**

**Federal Plans**

The 1994 Sacramento Regional Clean Air Plan (also called the State Implementation Plan or SIP) was developed cooperatively with all the districts in the Sacramento Region: El Dorado Air Pollution Control District (APCD), Feather River Air Quality Management District (AQMD), Placer County

APCD, SMAQMD, and Yolo-Solano AQMD. The Clean Air Plan was adopted in 1994 in compliance with the 1990 Amendments to the Federal Clean Air Act. At that time, the Sacramento region could not show that it would meet the federal 1-hour ozone standard by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of “severe nonattainment” for the federal 1-hour ozone standard, with additional emission requirements on stationary sources.

As a “severe nonattainment” area, the Sacramento Region is required to submit a rate-of-progress milestone evaluations pursuant to Section 182(g) of the Federal Clean Air Act. The Sacramento Regional 1999 Milestone Report was also developed cooperatively with the above-named districts and included a compliance demonstration that the milestone requirements were met. The 2002 Milestone Report also includes a compliance demonstration that the 2002 milestone requirement has been met for the Sacramento nonattainment area.

The Sacramento region has been designated as a “serious” nonattainment area for the federal 8-hour ozone standard with an attainment deadline of June 2013. The Sacramento region air districts adopted the 8-Hour Ozone Attainment and Reasonable Further Progress Plan in early 2009. 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 standard for the Sacramento region. In addition, the plan establishes an updated emissions inventory, provides photochemical modeling results, proposes the implementation of reasonably available control measures, and sets new motor vehicle emission budgets for transportation conformity purposes.

On October 16, 2006, the EPA promulgated a new 24-hour standard for PM<sub>2.5</sub>. This change lowered the daily standard from 65µg/m<sup>3</sup> to 35µg/m<sup>3</sup> to protect the general public from short-term exposure of the fine particulate matter. As shown in Table 3.1-8, Sacramento County does not meet the new standards. If designated nonattainment, an attainment plan must be submitted not later than 3 years after the effective date of the designation (EPA estimates this to be April 2012). The plan must include transportation conformity budgets and control measures.

### **State Plans**

The CCAA 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 standards. In compliance with the CCAA, the SMAQMD prepared and submitted the 1991 Air Quality Attainment Plan mainly to address Sacramento County’s nonattainment status for ozone and CO. The CCAA also requires that by the end of 1994 and once every 3 years thereafter, the districts are to assess their progress toward attaining the air quality standards. 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 three-year period. The latest Triennial Report (2003 Triennial Report) was approved by the SMAQMD Board of Directors on April 28, 2005. In addition, the SMAQMD is required to submit an annual progress report to the CARB by December 31 of each year.

## Climate Change

Climate change is caused by greenhouse gases emitted all around the world from a variety of sources, including the combustion of fuel for transportation and heat, cement manufacturing, and refrigerant emissions. International and federal agreements have been enacted to deal with climate change issues. The State of California has enacted key legislation in an effort to reduce its contribution to climate change, as discussed below.

### ***International and Federal***

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

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

A particularly notable result of the United Nations Framework Convention on Climate Change efforts is a treaty known as the Kyoto Protocol, which went into effect on February 16, 2005. When countries sign the Protocol, they demonstrate their commitment to reduce their emissions of greenhouse gases or engage in emissions trading. More than 170 countries are currently participating in the Protocol. Industrialized countries are required to reduce their greenhouse gas emissions by an average of 5 percent below their 1990 levels by 2012. In 1998, United States Vice President Al Gore symbolically signed the Protocol; however, in order for the Protocol to be formally ratified, the United States Congress must approve it. Congress did not approve the Protocol during the Clinton Administration, and the past US President, George W. Bush, did not submit the treaty for ratification; it is unknown whether President Obama will submit the treaty for ratification.

In October 1993, President Clinton announced his Climate Change Action Plan, which had a goal to return greenhouse gas emissions to 1990 levels by the year 2000. This was to be accomplished through 50 initiatives that relied on innovative voluntary partnerships between the private sector and government aimed at producing cost-effective reductions in greenhouse gas emissions.

The EPA currently does not regulate greenhouse gas emissions from vehicles. *Massachusetts v. EPA* (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that EPA regulate four greenhouse gases, including carbon dioxide, under Section 202(a)(1) of the Clean Air Act. A decision was made on April 2, 2007, in which the

Supreme Court held that petitioners have standing to challenge the EPA and that the EPA has statutory authority to regulate greenhouse gases emissions from new motor vehicles.

In April 2009, EPA published a Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. EPA is proposing to find that the current and projected concentrations of the mix of six key greenhouse gases—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>)—in the atmosphere threaten the public health and welfare of current and future generations. EPA is further proposing to find that the combined emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and HFCs from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key greenhouse gases and hence to the threat of climate change. The proposed action does not itself impose any requirements on industry or other entities. However, the finding, if finalized by the EPA, is a key step in regulating GHGs under the CAA.

Federal regulation of GHGs can occur through other means, such as fuel efficiency standards. President Barack Obama put into motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. The new standards would cover model years 2012 through 2016 and would require an average fuel economy standard of 35.5 miles per gallon in 2016. A new Corporate Average Fuel Economy (CAFE) law was passed by Congress in 2007, which required an average fuel economy of 35 miles per gallon in 2020. EPA and the National Highway Traffic Safety Administration (NHTSA), on behalf of the Department of Transportation (DOT), released a notice of intent to conduct joint rulemaking to establish vehicle GHG emissions and CAFE standards in May 2009. It should be noted, however, that EPA's involvement in the joint rulemaking is dependent upon finalizing the endangerment finding discussed above, thereby providing regulatory authority over GHG emissions to the EPA.

### **State**

There has been significant legislative and regulatory activities that affect climate change and greenhouse in the State of California, as discussed below:

**Executive Order S-3-05.** On June 1, 2005, the Governor issued Executive Order S 3-05 which set the following greenhouse gas emission reduction targets:

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

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive, but achievable, mid-term target. To meet these targets, the Governor directed the Secretary of the California EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation, and

Housing Agency; the Department of Food and Agriculture; the Resources Agency; the CARB; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met (CAT 2006).

The Governor signed **Executive Order S-01-07** on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

**AB 32.** In 2006, the California State Legislature enacted the California Global Warming Solutions Act of 2006, also known as AB 32. AB 32 focuses on reducing greenhouse gas emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. The California Air Resources Board (CARB) is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases. AB 32 require CARB to determine what the statewide greenhouse gas emissions level was in 1990, and approve a statewide greenhouse gas emissions limit so it may be applied to the 2020 benchmark. CARB approved a 1990 greenhouse gas emissions level of 427 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>e), on December 6, 2007 in its Staff Report. Therefore, in 2020, emissions in California are required to be at or below 427 MMTCO<sub>2</sub>e.

Under the current "business as usual" scenario, statewide emissions are increasing at a rate of approximately 1 percent per year as noted below. Also shown are the average reductions needed from all statewide sources (including all existing sources) to reduce greenhouse gas emissions back to 1990 levels.

- 1990: 427 MMTCO<sub>2</sub>e
- 2004: 480 MMTCO<sub>2</sub>e (an average 11-percent reduction needed to achieve 1990 base)
- 2008: 495 MMTCO<sub>2</sub>e (an average 14-percent reduction needed to achieve 1990 base)
- 2020: 596 MMTCO<sub>2</sub>e "Business As Usual" (an average 28-percent reduction needed to achieve 1990 base)

Under AB 32, CARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California in October 2007. Discrete early action measures are currently underway or are enforceable by January 1, 2010. Early action measures are regulatory or non-regulatory and are currently underway or to be initiated by the CARB in the 2007 to 2012 timeframe. CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of those early action measures, nine are considered discrete early

action measures, as they are regulatory and enforceable by January 1, 2010. CARB estimates that the 44 recommendations are expected to result in reductions of at least 42 MMTCO<sub>2</sub>e by 2020, representing approximately 25 percent of the 2020 target.

The CARB Board approved a Climate Change Scoping Plan in December 2008. The Plan “proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health.” The measures in the Scoping Plan will be developed over the next two years through rule development at the CARB and other agencies, and are expected to be in place by 2012.

As noted in the Scoping Plan, the projected total business-as-usual emissions for year 2020 (estimated as 596 MMTCO<sub>2</sub>e) must be reduced approximately 30 percent to achieve the CARB’s approved 2020 emission target of 427 MMTCO<sub>2</sub>e. The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related 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; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State’s long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between “capped” and “uncapped” strategies. Capped strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the cap-and-trade program will help ensure that the year 2020 emission targets are met, despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped



strategies that will not be subject to the cap-and-trade emissions caps and requirements, and are provided as a margin of safety by accounting for additional GHG emission reductions.

**Title 24.** Although it was not originally intended to reduce greenhouse gases, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. The latest amendments were made in October 2005 and currently require new homes to use half the energy they used only a decade ago. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions.

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

**SB 375** passed the Senate on August 30, 2008 and was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of greenhouse gas emissions and contributes over 40 percent of the greenhouse gas emissions in California; automobiles and light trucks alone contribute almost 30 percent. SB 375 indicates that greenhouse gases from automobiles and light trucks can be reduced by new vehicle technology, but significant reductions from changed land use patterns and improved transportation are necessary. SB 375 states that "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) it requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing greenhouse gas emissions, (2) it aligns planning for transportation and housing, and (3) it creates specified incentives for the implementation of the strategies.

Pursuant to SB 375, the CARB appointed a Regional Targets Advisory Committee (RTAC) to provide recommendations on factors to be considered and methodologies to be used in CARB's target

setting process. The RTAC provided its recommendations in a report to CARB on September 29, 2009. CARB must propose draft targets by June 10, 2010 and must adopt final targets by September 30, 2010.

**SB 97** was passed in August 2007 and added Section 21083.05 to the Public Resources Code. The code states “(a) On or before July 1, 2009, the Office of Planning and Research (OPR) shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a).” Section 21097 was also added to the Public Resources Code. It indicates that the failure to adequately analyze the effects of greenhouse gases in a document related to the environmental review of a transportation project funded under the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 does not create a cause of action for a violation. However, SB 97 does not safeguard non-transportation funded projects from court challenges for omitting a climate change analysis.

**AB 1493.** California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light-duty trucks. Regulations adopted by the CARB would apply to 2009 and later-model-year vehicles. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030. However, the regulation has been stalled by automaker lawsuits and by the EPA’s refusal to grant California an implementation waiver. The CARB originally requested this waiver in December 2005. That request was denied by EPA on March 6, 2008. On January 26, 2009, President Obama signed a Presidential Memorandum directing EPA to assess whether denial of the waiver based on California’s application was appropriate in light of the Clean Air Act. On June 30, 2009, EPA granted a waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year.

**CEQA Guidelines Update.** On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the CEQA Guidelines for GHG emissions, as required by Senate Bill 97 (Chapter 185, 2007). These proposed CEQA Guidelines amendments would provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The Draft GHG Guidelines fit within the existing CEQA framework by amending existing Guidelines to reference climate change. The Natural Resources Agency (Resources Agency) will conduct formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by Senate Bill 97. On July 3, 2009, Resources Agency began the rulemaking process, publishing a Notice of Proposed Action to start the public comment period on the proposed Guidelines amendments. Public hearings are scheduled in Sacramento and Los Angeles on

August 18 and 20, respectively. The Resources Agency will accept written comments until August 20, 2009.

OPR proposes adding a new section, CEQA Guidelines Section 15064.4, to assist agencies in determining the significance of GHG emissions. As proposed, the new Guidelines section would allow agencies the discretion to determine whether a quantitative or qualitative analysis is best for a particular project. Importantly, however, little guidance is offered on the crucial next step in this assessment process – how to determine whether the project’s estimated GHG emissions are significant or cumulatively considerable.

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

OPR also proposes a Guidelines section that would encourage agencies to tier and streamline the GHG emissions analysis in certain cases. Section 15183.5 permits programmatic GHG analysis and later project-specific tiering, as well as the preparation of GHG Reduction Plans. Compliance with such plans can support a determination that a project’s cumulative effect is not cumulatively considerable, according to proposed Section 15183.5(b).

In addition, the amendments propose revisions to Appendix F of the CEQA Guidelines, which focuses on Energy Conservation, and Appendix G, which includes the sample Environmental Checklist Form. OPR would amend the Checklist to include the following questions:

*Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*

And,

*Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG?*

#### *Non Legislative/Non Adopted Legislation*

**Governor’s Office of Planning and Research.** The Governor’s Office of Planning and Research (OPR) published a technical advisory on CEQA and Climate Change, as required under SB 97, on June 19, 2008. The guidance did not include a suggested threshold, but it stated that the OPR has asked CARB to “recommend a method for setting thresholds which will encourage consistency and

uniformity in the CEQA analysis of GHG emissions throughout the state.” The OPR does recommend that CEQA analyses include the following components:

- Identify GHG emissions
- Determine significance
- Mitigate impacts

The OPR has also started tracking environmental documents that contain GHG analysis and mitigation measures. The website [www.ceqamap.com](http://www.ceqamap.com) contains the list of documents in electronic form and is maintained by CEQAdocs.com.

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

In addition, CAPCOA released the Model Policies for Greenhouse Gases in General Plans in June 2009, as a resource document for public agencies. Model policies are provided in nine major categories: GHG reduction planning (overall), land use and urban design, transportation, energy efficiency, alternative energy, municipal operations, waste reduction and diversion, conservation and open space, and education. The document provides a table to assist local agencies in evaluating the policies for local use, and examples of plans that have incorporated the model policy (or similar policy).

### **Sacramento County**

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

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

#### *Chicago Climate Exchange*

In February 2007, the County joined the Chicago Climate Exchange. The Chicago Climate Exchange is the world’s first—and North America’s only—voluntary, legally binding, rules-based greenhouse

gas emission reduction and trading system. Chicago Climate Exchange Phase I members committed to reduce GHG emissions 1 percent per year over the years 2003 through 2006 relative to a 1998 through 2001 average baseline. Members agreed to reduce GHG emissions by a total of 4 percent below the baseline by 2006. Chicago Climate Exchange Phase II members commit to reduce GHG emissions from 1.25 percent to 0.50 percent per year through the years 2007 through 2010, for a grand total of 6 percent below the baseline.

Those members that reduce their emissions annually beyond the committed level can sell surplus emission allowances on the Chicago Climate Exchange or bank them. A member that cannot achieve the annual reduction target within its organization can meet its commitment by purchasing emissions allowances through the Chicago Climate Exchange from other Chicago Climate Exchange members that reduce their emissions beyond the reduction target.

The goals of Chicago Climate Exchange are:

1. To facilitate the transaction of GHG emissions allowance trading with price transparency, design excellence and environmental transparency.
2. To build the skills and institutions needed to cost-effectively manage GHG emissions.
3. To facilitate capacity-building in both public and private sector to facilitate mitigation.
4. To strengthen the intellectual framework required for cost effective and valid reduction.
5. To help inform the public debate on managing the risk of global climate change.

Chicago Climate Exchange members make a commitment to:

1. Measure, report, and reduce GHG emissions.
2. Establish an emission reduction schedule.
3. Implement GHG emissions management.
4. Participate in annual emissions audits.

The County provided Chicago Climate Exchange current and historical energy and fuel purchase data for fiscal years 2000, 2001, 2002, 2003, 2004, and 2005. The data submitted is for County-owned facilities and vehicles. The County's commitment to join does not apply to businesses, other government agencies, or residents within the County boundary, it applies only to emissions generated by Sacramento County as an organization. Preliminary review by the Chicago Climate Exchange indicates the County could be in a position to sell surplus emission allowances for the period of 2003 through 2010. This data will be subject to an audit before a formal baseline is established and exact credits can be calculated.

It is expected, based on information available and preliminary review by the Chicago Climate Exchange, that the County will receive potential financial reward from participation in the Chicago

Climate Exchange. The County may be eligible to sell excess allowances for 2003, 2004, and 2005. Fiscal year 2006 is half-complete, and it would appear the County would again be in a sell position. Fiscal years 2007 through 2010 will be dependent on the County's continued commitment to energy conservation and fleet conversion. The preliminary baseline for direct and indirect emissions for the County is 226,700 metric tons of CO<sub>2</sub>.

#### *Energy Conservation/Energy Efficiency Program*

The County of Sacramento has implemented policies and programs to conserve energy in County facilities and reduce emissions from the County fleet of vehicles. The Board of Supervisors approved an Energy Conservation/Energy Efficiency Program in 2001. The program aims to reduce electrical energy usage during peak periods of the day. The program contains 10 measures, such as participating in Sacramento Municipal Utility Districts Voluntary Emergency Curtailment Program, setting building temperatures to 78° F to decrease cooling demand, and dual switching of lights. The County converted 108 of 150 trucks to liquid natural gas (LNG) in the Refuse Collection Fleet. The Heavy Rental Fleet now includes 18 propane-powered vehicles.

The Light Fleet includes 95 hybrid vehicles and 3 compressed natural gas vehicles. Replacement vehicles to the Light Fleet will be hybrid vehicles. The Sacramento International Airport operates LNG shuttle buses.

#### *Sustainability Cabinet*

The Sacramento County Sustainability Cabinet was formed in September of 2007. The Cabinet is tasked with developing a County sustainability plan for County energy management, developing a County green building policy, and exploring legislative priorities. The intent is to gather the various environmental initiatives that are currently underway to ensure a coordinated county effort. The Sustainability Cabinet will also facilitate the baseline reporting for the Chicago Climate Exchange, CCAR, ICLEI, and conformance with AB 32.

#### *California Climate Action Registry*

The County joined the California Climate Action Registry (Registry) in December 2006. The Registry is non-profit public/private partnership that serves as a voluntary GHG registry to protect, encourage, and promote early actions to reduce GHG emissions. Registry participants agree to calculate, certify, and publicly report GHG emissions. The Registry provides a reporting tool, standards, and protocol for reporting GHG emissions.

#### *Cities for Climate Protection/International Council for Local Environmental Initiatives (ICLEI)*

Sacramento County joined ICLEI in 2007. The Cities for Climate Protection is administered under the International Council for Local Environmental Initiatives (ICLEI). The following is a brief description of the program from ICLEI's website ([www.iclei.org](http://www.iclei.org)):

The Cities for Climate Protection™ (CCP) Campaign enlists cities to adopt policies and implement measures to achieve quantifiable reductions in local greenhouse gas

emissions, improve air quality, and enhance urban livability and sustainability. More than 650 local governments participate in the CCP, integrating climate change mitigation into their decision-making processes.

The campaign is based on an innovative performance framework structured around five milestones that local governments commit to undertake. The milestones allow local governments to understand how municipal decisions affect energy use and how these decisions can be used to mitigate global climate change while improving community quality of life. The CCP methodology provides a simple, standardized way of acting to reduce greenhouse gas emissions and of monitoring, measuring, and reporting performance.

#### *Green Fleets*

The City and County of Sacramento have adopted a heavy-duty, low-emission vehicle (LEV) acquisition policy. The policy goal is to reduce oxides of nitrogen (NO<sub>x</sub>) emissions from heavy-duty fleet vehicles to meet the year 2005 standard for ozone in the Sacramento Federal Ozone Nonattainment area. As of 2004, the County had committed to replace 50 percent off the fleet to low-emission vehicles.

#### **SMAQMD**

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

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

In addition, the SMAQMD joined the CCAR in 2006 and has completed its own emissions inventory for 2005, 2006, and 2007.

The SMAQMD is in the process of updating its CEQA Guide to Air Quality Assessment. The draft updated document includes a chapter for the Program-Level Analysis of General and Area Plans. However, as the project would not involve the a new general or area plan, this draft guidance is not applicable to the project.

**Sacramento Regional Council of Governments**

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

**Sacramento Area Green Partnership**

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

**3.1.4 - Project Impact Analysis****Methodology for Analysis**

Motor vehicles are the primary source of ozone precursors within the region, and the project area. Therefore, changes in traffic patterns, trip generation, or congestion were taken from the traffic section of this document to assess potential air quality changes. Additionally, additions or deletion of transit service or bike and pedestrian facilities might affect air quality, and were included in the air quality assessment.

**Thresholds of Significance**

For the purposes of this EIR, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

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

**Greenhouse Gas Emissions**

There are no adopted thresholds for measuring the significance of a project's impact on the creation of greenhouse gas (GHG) emissions or a project's contribution to global climate change. Therefore, the OPR's recommended thresholds will be used for the purposes of this EIR. The thresholds are as follows:

*Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*



And,

*Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG?*

### 3.1.5 - Impact Statements and Mitigation Discussions

#### Air Quality Plan

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**Impact 3.1-1:**           **The project would not conflict with or obstruct implementation of the applicable air quality plan:**

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#### ***Impact Analysis***

The proposed incorporation would involve the transfer of municipal authority and services from the County of Sacramento to a newly formed City of Arden Arcade. The policies and provisions of the County's General Plan, zoning ordinance, and other land use regulations would be formally adopted by the new city upon incorporation. As a result, the project would not have any direct physical impacts related to air quality because the project does not involve construction activities or creation of new emission sources. Similarly, the proposed transfer of municipal authority would not affect current air quality regulations as adopted by the SMAQMD, and would have no effect on the implementation of applicable attainment plans. The new City of Arden Arcade is located in Sacramento County and would continue to be subject to current regulations related to emissions within the purview of the SMAQMD. As such, the project will not conflict with or obstruct implementation of the applicable air quality plans. The mitigation identified in Section 3.5, Land Use and Planning further reduces this less than significant impact by ensuring that development conforms with the 1993 Sacramento County General Plan until the new city adopts its own general plan.

#### ***Significance Determination Before Mitigation***

Less than significant impact.

#### ***Mitigation Measures***

Refer to Mitigation Measure 3.5-2.

#### ***Significance Determination After Mitigation***

Less than significant impact.

#### **Air Quality Standards**

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**Impact 3.1-2:**           **The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation:**

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#### ***Impact Analysis***

The proposed incorporation would not have any direct physical impacts related to air emissions because the project does not involve the movement of earth or creation of new emission sources. In this context, the project would not create any new emission sources beyond existing conditions;

therefore, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

***Significance Determination Before Mitigation***

Less than significant impact.

***Mitigation Measures***

No mitigation is required.

***Significance Determination After Mitigation***

Less than significant impact.

**Criteria Pollutants in Nonattainment Area**

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**Impact 3.1-3:**        **The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors):**

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***Impact Analysis***

As previously indicated, the project would not result in the creation of any new emission sources when compared with existing conditions; therefore, it is reasonable to conclude that the project would not result in a cumulatively considerable net increase of any criteria pollutant.

***Significance Determination Before Mitigation***

Less than significant impact.

***Mitigation Measures***

No mitigation is required.

***Significance Determination After Mitigation***

Less than significant impact.

**Sensitive Receptors**

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**Impact 3.1-4:**        **The project would not expose sensitive receptors to substantial pollutant concentrations:**

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***Impact Analysis***

As previously indicated, the project would not involve the operation of any new temporary or permanent emission sources or create substantial air pollutant concentrations, which could adversely affect nearby sensitive receptors.

***Significance Determination Before Mitigation***

Less than significant impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

Less than significant impact.

**Odors**

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**Impact 3.1-5:           The project would not create objectionable odors affecting a substantial number of people:**

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**Impact Analysis**

As previously indicated, the project would not result in any changes to existing land use patterns or to the current baseline conditions with regard to existing sources of odors.

**Significance Determination Before Mitigation**

No impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

No impact.

**Greenhouse Gas Emissions**

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**Impact 3.1-6:           The project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment:**

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**Impact Analysis**

The proposed incorporation would not have any direct physical impacts related to greenhouse gas emissions, because the project does not involve construction activities or creation of new emission sources. In this context, the project would not result in a net increase in greenhouse gas emissions. Additionally, the proposed transfer of municipal authority and continuation of the policies and provisions contained within the existing County General Plan, zoning ordinance, and other existing land use regulatory measures would not contribute to global warming.

**Significance Determination Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

Less than significant impact.

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**Impact 3.1-7: The project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing emissions of greenhouse gases:**

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### ***Impact Analysis***

As previously stated, the project would not have any direct physical impacts related to greenhouse gas emissions because the proposal does not involve the movement of earth or creation of new emission sources. Additionally, the proposed transfer of municipal authority and continuation of the policies and provisions contained within the existing County General Plan, zoning ordinance, and other existing land use regulatory measures would not contribute to global warming.

Two plans for reducing greenhouse gas emissions that are applicable to the project are the Sacramento County Climate Action Plan (CAP) and the CARB's Scoping Plan. The Scoping Plan has been adopted, whereas the County's CAP has not yet been adopted. In addition, the Regional Targets Advisory Committee (RTAC) has submitted its recommendations for factors to consider and methodologies to be used for SB 375 compliance to the CARB.

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

As discussed in the regulatory section, the Draft CAP, also referred to as the Phase 1 CAP, has not been adopted. The Draft CAP contains descriptions of existing Sacramento County actions that reduce GHG, and potential actions the County could enact to further reduce GHG emissions. Actions range from build environment components—pedestrian infrastructure and systems and operational measures such as utilizing GPS to minimize travel for County-owned vehicles—to studying the cost, benefits, and feasibility for additional programs.

Many measures are not directly related to implementation of an ordinance or an adopted general plan goal or policy. Therefore, the new city may not be required to implement those measures within the Draft CAP that are not generated by ordinances, or adopted general plan goals or policies. However, this is not a significant impact, primarily because the Draft CAP is not an adopted document: it does not contain required future actions; rather, it identifies potential future actions for the County to enact. As stated in the Draft CAP executive summary:

This Phase 1 CAP summarizes actions the County has already taken within its jurisdictional control and identifies a menu of possible future actions to be considered. The Phase 1 CAP will be adopted concurrent with the adoption of the 2030 General Plan. Phase 2 of the CAP—to be adopted one year following the County's 2030 General Plan adoption—will present a prioritized list of the recommended actions, based on economic and other analyses, and provide a schedule and cost for implementation.

#### *SB 375 Regional Targets*

As described in the regulatory setting, the CARB is required to propose regional greenhouse gas emissions targets by June 2010 and adopt final targets by September 30, 2010. The targets are for the 18 Metropolitan Planning Organizations (MPOs) in California. The MPOs will be responsible for

preparing Sustainable Community Strategies (SCS) and, if needed, Alternative Planning Strategies (APS) that detail their region's strategy for meeting the emission reduction targets. As part of the target setting process, the largest MPOs will participate in additional analysis (scenario modeling) to find the upper limits for the amount of reductions that can be achieved.

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

Currently, the CARB has not adopted regional targets for emission reductions, and SACOG has not adopted a new MTP for achieving the GHG reduction targets as mandated in SB 375. When targets are adopted, the new city will have the opportunity to participate with SACOG in preparing the MTP.

#### *CARB's Scoping Plan*

The Scoping Plan's measures mainly target reductions in the transportation and electricity sectors. Implementation of Scoping Plan measures would directly and obliquely affect the generation of greenhouse gas emission from within the project area. As stated in the regulatory setting, the measures are anticipated to be implemented through rules/regulations. Compliance with applicable rules and regulations is required.

Because the new city would have land use authority and municipal activities, there is a potential for the city to affect the design and implementation of future development and municipal activities. Therefore, mitigation is proposed to reduce the potential for conflict with the CARB's Scoping Plan.

#### ***Significance Determination Before Mitigation***

Potentially significant impact.

#### ***Mitigation Measures***

**MM 3.1-7** LAFCo shall condition the incorporation approval to require the new city to develop a community-wide and municipal greenhouse gas emissions inventory and a Climate Action Plan concurrent with the development of the city's first General Plan. At a minimum, the Climate Action Plan shall include the following components:

- Baseline and future year emission inventories for the community and local government operations
- Emission reduction targets for 2020 and 2030
- Descriptions of strategies selected to achieve targets

- Emission reduction estimates from potential reduction measures and strategies
- Implementation plan with mechanisms for monitoring and course corrections

***Significance Determination After Mitigation***

Less than significant impact.