

SUMMARY

Implementation of the proposed project would generate both construction and operational air pollutant emissions. Construction-related emissions would be generated by on-site stationary sources, on- and off-road heavy-duty construction vehicles, and construction worker vehicles. Operation-related emissions would be generated by on-site area and stationary sources and by mobile sources. During project construction, emissions of oxides of nitrogen (NO_x) and respirable particulate matter (PM₁₀) would exceed the thresholds of significance for regional impacts recommended by the South Coast Air Quality Management District (SCAQMD). In addition, a localized air quality impact would occur as project construction would result in PM₁₀ and PM_{2.5} emissions that exceed the localized significance thresholds at nearby sensitive receptors. At project buildout, operational emissions of criteria pollutants would not exceed SCAQMD thresholds. Therefore, operational emissions are anticipated to be less than significant.

In addition, population growth attributed to the project is within the growth forecasts contained in the 2004 Regional Transportation Plan (2004 RTP) prepared by the Southern California Association of Governments (SCAG). The 2007 RTP forms the basis for the land use and transportation control portions of the 2007 Air Quality Management Plan (2007 AQMP). Because the project is within the growth forecasts for the region, it would, consequently, be consistent with the 2007 AQMP, indicating that it would not jeopardize attainment of state and federal ambient air quality standards in the Santa Clarita Valley or throughout the South Coast Air Basin (the basin).

Mitigation measures would be implemented that would reduce construction-related emissions to the maximum extent feasible. However, no feasible mitigation exists that would reduce the project's construction-related emissions of NO_x, PM₁₀, or PM_{2.5} to below the SCAQMD's recommended thresholds of significance or the localized significance thresholds.¹ Therefore, the project's construction-related emissions would be considered significant and unavoidable.

The relevant SCAQMD criteria were used to assess cumulative air quality impacts. Based on this analysis, cumulative air quality impacts would be less than significant given the cumulative project thresholds of significance found in the SCAQMD's California Environmental Quality Act (CEQA) Air Quality Handbook.²

¹ NO_x emissions would only exceed SCAQMD's threshold of significance for six weeks during the 54-month construction period, and PM₁₀ and PM_{2.5} emissions would only exceed the thresholds of significance during project on- and off-site grading operations.

² The CEQA Air Quality Handbook is in the process of being revised and replaced by an Air Quality Analysis Guidance Handbook (Air Quality Guidance Handbook). As of January 2007, the SCAQMD has revised Chapters 2, 3, and 4 (www.aqmd.gov/ceqa/hdbk.html), but the full revision has not yet been completed.

All citations to sources and source materials are incorporated by reference and copies can be found at the City of Santa Clarita, Department of Planning and Building Services, 23920 Valencia Boulevard, Suite 300, Santa Clarita, California 91355.

INTRODUCTION TO AIR QUALITY

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB). The project site is located within the South Coast Air Basin, which is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east (see **Figure 5.2-1, South Coast Air Basin**). The project site is not located within either the SSAB or the MDAB.

The basin consistently generates the highest levels of smog in the United States and is considered to have the worst air quality in the nation. The factors that influence this determination are discussed below.

Smog and Its Causes

Smog is a general term based on the words smoke and fog that is used to describe dense, visible air pollution. Although some air pollutants are colorless, smog is commonly used to describe the general concentrations of pollutants in the air. Smog is formed when combustion emissions and gaseous emissions, such as volatile organic compounds (VOC) and NO_x, undergo photochemical reactions in sunlight to form ozone (O₃). Ozone is a gas that, in the upper atmosphere, helps to shield the earth from harmful radiation. However, in the lower atmosphere where people live, ozone poses health risks and damages crops, rubber, and other materials. Particulates, such as soil and dust materials, and vehicle exhaust particulates often mix with ozone, nitrogen dioxide (NO₂), and other compounds and create a brownish haze in the air. "Smog episode" warnings are issued when an occurrence of high concentrations of ozone is predicted that could endanger or cause harm to the public.³

The topography and climate of the basin combine to make it an area of high smog potential. During the summer months, a warm air mass frequently descends over the lower, cool, moist marine air layer. The warm upper layer forms a cap over the marine layer and inhibits the air pollutants generated near the ground from dispersing upward. Light summer winds and the surrounding mountains further limit the horizontal disbursement of the pollutants. Concentrating volumes of pollutants in this manner allows the summer sunlight to generate high levels of smog. In the winter, cool ground temperatures and very

³ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, April 1993), G1s-7.

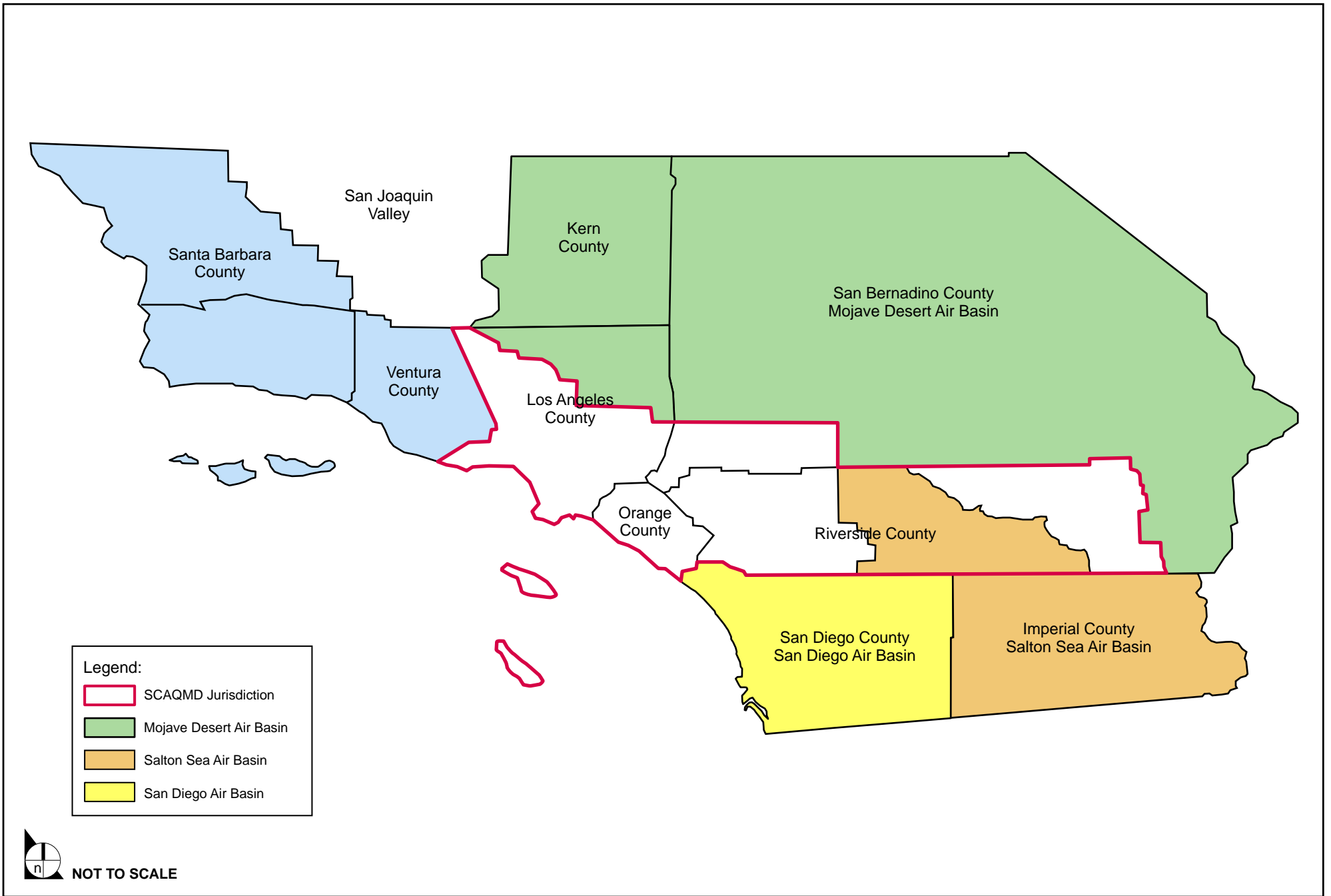


FIGURE 5.2-1

South Coast Air Basin

light winds cause extremely low inversions and air stagnation that trap CO and NO_x during the late night and early morning hours. On days when no inversions occur, or when winds average 25 miles per hour or more, there will be no important smog effects. A summary of local climatic conditions is provided later in this section.⁴

The air pollutants within the basin are generated by both stationary and mobile sources. One type of stationary source is known as a “point source,” which has one or more emission sources at a single facility. The other type of stationary source is the “area source,” which is widely distributed and produces many small emissions. Point sources are usually associated with manufacturing and industrial uses and include sources that produce electricity or process heat, such as refinery boilers or combustion equipment, but may also include commercial establishments, like gasoline stations, dry cleaners, or charbroilers in restaurants. Examples of area sources include residential water heaters, painting operations, lawn mowers, agricultural fields, landfills, and consumer products, such as barbecue lighter fluid or hair spray. In 2006, mobile sources account for over 95 percent of the CO emissions, approximately 60 percent of the sulfur oxides (SO_x) emissions, over 90 percent of the NO_x emissions, and over 60 percent of the VOC emissions that occur within the basin.⁵

Global Climate Change

Description of the Greenhouse Effect

Heat retention within our atmosphere is an essential process to sustain life on Earth. The natural process through which heat is retained in the troposphere⁶ is called the “greenhouse effect.” The greenhouse effect traps heat in the troposphere through a three-fold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and greenhouse gases (GHGs) in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and toward the Earth. This “trapping” of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. Without the greenhouse effect, the Earth’s average temperature would be approximately -18 degrees Celsius (°C) (0° Fahrenheit [°F]) instead of its present 14°C (57°F).⁷ The most abundant GHGs are water

⁴ South Coast Air Quality Management District, *Air Quality Analysis Guidance Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 2001), 3-17-3-18. <http://www.aqmd.gov/ceqa/hdbk.html>.

⁵ California Air Resources Board. “2006 Estimated Basin Data – South Coast Air Basin.” May 19, 2008. <http://www.arb.ca.gov/ei/maps/basins/abscmap.htm>.

⁶ The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth’s surface to 10 to 12 kilometers).

⁷ National Climatic Data Center. “Global Warming Frequently Asked Questions.” February 3, 2006. <http://www.ncdc.noaa.gov/oa/climate/globalwarming.html>.

vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long-wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long-wave radiation. The GWP of a gas is determined using carbon dioxide as the reference gas with a GWP of 1 and the ability to re-radiate long-wave radiation increases with the assigned GWP.

Greenhouse Gases

Primary Greenhouse Gases

Greenhouse gases include, but are not limited to, the following compounds.⁸

- Water vapor (H₂O). Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Water vapor and clouds contribute 66 to 85 percent of the greenhouse effect (water vapor alone contributes 36 to 66 percent).⁹ Natural processes, such as evaporation from oceans and rivers and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.¹⁰ The primary human-related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than 1 percent) to atmospheric concentrations of water vapor.¹¹ Therefore, the control and reduction of water vapor emissions is not within reach of human actions. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.
- Carbon dioxide (CO₂). Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of carbon dioxide in the atmosphere has increased 35 percent.¹² Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs. In 2004, 83.8 percent of California's GHG emissions were carbon dioxide.¹³

⁸ All Global Warming Potentials (GWPs) are given as 100-year GWP. Unless noted otherwise, all GWPs were obtained from the Intergovernmental Panel on Climate Change. *Climate Change 1995: The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*. Cambridge (UK): Cambridge University Press. 1996.

⁹ Real Climate. "Water Vapour: Feedback or Forcing?" April 6, 2005. <http://www.realclimate.org/index.php?p=142>.

¹⁰ United States Geological Survey. "The Water Cycle: Evaporation." August 28, 2006. <http://ga.water.usgs.gov/edu/watercycleevaporation.html>

¹¹ Energy Information Administration. "Alternatives to Traditional Transportation Fuels 1994." July 17, 2002. <http://www.eia.doe.gov/cneaf/alternate/page/environment/exec2.html>.

¹² United States Environmental Protection Agency. "Inventory of US Greenhouse Gas Emissions and Sinks, 1990-2004." April 2006. <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

¹³ California Energy Commission. "Inventory of California Greenhouse Gas Emissions and Sinks, 1990 to 2004." Figure 2. December 2006. <http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF>.

- Methane (CH₄). Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane come from landfills, natural gas systems, and enteric fermentation.¹⁴ Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.
- Nitrous oxide (N₂O). Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.
- Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing as the continued phase-out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 6,300 for HFC-236fa.
- Perfluorocarbons (PFCs). Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).¹⁵ The GWP of PFCs range from 5,700 to 11,900.
- Sulfur hexafluoride. Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm]).¹⁶

Other Greenhouse Gases

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone depleters; therefore, their gradual phase-out is currently in effect. A few of these compounds are discussed below:

- Hydrochlorofluorocarbons (HCFCs). HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the protocol are subject to a

¹⁴ United States Environmental Protection Agency. "Methane: Sources and Emissions." October 19, 2006. <http://www.epa.gov/methane/sources.html>.

¹⁵ Energy Information Administration. "Other Gases: Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride." October 29, 2001. http://www.eia.doe.gov/oiaf/1605/gg00rpt/other_gases.html.

¹⁶ United States Environmental Protection Agency. "High GWP Gases and Climate Change." October 19, 2006. <http://www.epa.gov/highgwp/scientific.html#sf6>.

consumption cap and gradual phase-out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.¹⁷

- 1,1,1-trichloroethane. 1,1,1-trichloroethane, or methyl chloroform, is a solvent and degreasing agent commonly used by manufacturers. In 1992, the United States Environmental Protection Agency (US EPA) issued Final Rule 57 FR 33754 scheduling the phase out of methyl chloroform by 2002.¹⁸ Therefore, the threat posed by methyl chloroform as a GHG will diminish. Nevertheless, the GWP of methyl chloroform is 110 times that of carbon dioxide.¹⁹
- Chlorofluorocarbons (CFCs). CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the US EPA's Final Rule 57 FR 3374 for the phase out of ozone depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC-11 to 14,000 for CFC-13.²⁰
- Ozone. Ozone occurs naturally in the stratosphere where it is largely responsible for filtering harmful ultraviolet (UV) radiation. In the troposphere, ozone acts as a GHG by absorbing and re-radiating the infrared energy emitted by the Earth. As a result of the industrial revolution and rising emissions of NO_x and volatile organic compounds (VOCs) (ozone precursors), the concentrations of ozone in the troposphere have increased.²¹ Due to the short life span of ozone in the troposphere, its concentration and contribution as a GHG is not well established. However, the greenhouse effect of tropospheric ozone is considered small, as the radiative forcing of ozone is 25 percent of that of carbon dioxide.^{22,23}

¹⁷ United States Environmental Protection Agency. Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone-Depleting Substances. November 7, 2006. <<http://www.epa.gov/fedrgstr/EPA-AIR/1996/January/Day-19/pr-372.html>>.

¹⁸ United States Environmental Protection Agency. The Accelerated Phase-Out of Class 1 Ozone-Depleting Substances. April 17, 2006. <<http://www.epa.gov/ozone/title6/phaseout/acfact.html>>.

¹⁹ United States Environmental Protection Agency. Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone-Depleting Substances. November 7, 2006, <<http://www.epa.gov/fedrgstr/EPA-AIR/1996/January/Day-19/pr-372.html>>.

²⁰ United States Environmental Protection Agency. Class I Ozone Depleting Substances. March 7, 2006. <<http://www.epa.gov/ozone/ods.html>>.

²¹ Intergovernmental Panel on Climate Change. Climate Change 2001: Tropospheric Ozone. March 24, 2006. <http://www.grida.no/climate/ipcc_tar/wg1/142.htm>.

²² Radiative forcing, measured in Watts/m², is an externally imposed perturbation (e.g., stimulated by greenhouse gases) in the radiative energy budget of the Earth's climate system (i.e., energy and heat retained in the troposphere minus energy passed to the stratosphere).

²³ Intergovernmental Panel on Climate Change. Climate Change 2007: The Physical Science Basis, Summary for Policymakers. February 2007. <http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf>.

Contribution to Greenhouse Gas Emissions

Global

Anthropogenic GHG emissions worldwide as of 2005 (the latest year for which data are available for Annex I countries) totaled approximately 30,800 CO₂ equivalent million metric tons (MMTCo₂E).²⁴ It should be noted that global emissions inventory data are not all from the same year and may vary depending on the source of the emissions inventory data.²⁵ Six countries and the European Community accounted for approximately 70 percent of the total global emissions (See **Table 5.2-1, Six Top GHG Producer Countries and the European Community**). The GHG emissions in more recent years may be substantially different than those shown in **Table 5.2-1**.

United States

As noted in **Table 5.2-1**, the United States was the top producer of greenhouse gas emissions as of 2005. Based on GHG emissions in 2004, six of the states—Texas, California, Pennsylvania, Ohio, Illinois, and Florida, in ranked order—would each rank among the top 30 GHG emitters internationally.²⁶ The primary greenhouse gas emitted by human activities in the United States was CO₂, representing approximately 84 percent of total greenhouse gas emissions.²⁷ Carbon dioxide from fossil fuel combustion, the largest source of US greenhouse gas emissions, accounted for approximately 80 percent of US GHG emissions.²⁸

²⁴ The CO₂ equivalent emissions are commonly expressed as “million metric tons of carbon dioxide equivalent (MMTCo₂E)” The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP, such that MMTCo₂E = (million metric tons of a GHG) × (GWP of the GHG). For example, the GWP for methane is 21. This means that emissions of one million metric tons of methane are equivalent to emissions of 21 million metric tons of CO₂.

²⁵ The global emissions are the sum of Annex I and non-Annex I countries without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries that 2004 data were unavailable, the UNFCCC data for the most recent year were used. United Nations Framework Convention on Climate Change, “Annex I Parties – GHG total without LULUCF,” http://unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/time_series_annex_i/items/3841.php and “Flexible GHG Data Queries” with selections for total GHG emissions excluding LULUCF/LUCF, all years, and non-Annex I countries, <http://unfccc.int/di/FlexibleQueries/Event.do?event=showProjection.n.d>.

²⁶ World Resources Institute, “How US State GHG Emissions Compare Internationally,” <http://earthtrends.wri.org/updates/node/106>. 2006.

²⁷ United States Environmental Protection Agency, “Inventory of US Greenhouse Gas Emissions.”

²⁸ Ibid.

Table 5.2-1
Six Top GHG Producer Countries and the European Community

Emitting Countries	GHG Emissions (MMTCO₂E)*
United States	7,241.51
China	4,882.72
European Community	4,192.61
Russian Federation	2,132.51
India	1,606.52
Japan	1,359.91
Germany ³	1,001.51
Total	21,415.7

Sources:

¹ United Nations Framework Convention on Climate Change http://unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/time_series_annex_i/items/3841.php

² GHG emissions for China and India (Calendar Year 2000) were obtained from the World Resources Institute's Climate Analysis Indicators Tool (CAIT) <http://www.cait.wri.org/cait.php>

³ Germany's GHG emissions are included in the European Community.

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

State of California

Based upon the 2004 GHG inventory data (the latest year available) compiled by the California Air Resources Board (CARB) for the California 1990 greenhouse gas emissions inventory, California emitted emissions of 484 MMTCO₂E, including emission resulting from out-of-state electrical generation.²⁹ CARB is a branch of the California Environmental Protection Agency (Cal/EPA), oversees air quality planning and control throughout California. Based on the CARB inventory and GHG inventories for countries contributing to the worldwide GHG emissions inventory compiled by the United Nations Framework Convention on Climate Change (UNFCCC) for 2005, California's GHG emissions rank second in the United States (Texas is number one) with emissions of 423 MMTCO₂E (excluding emissions related to imported power) and internationally between Ukraine (418.9 MMTCO₂E) and Spain (440.6 MMTCO₂E).³⁰

A California Energy Commission (CEC) emissions inventory report placed CO₂ produced by fossil fuel combustion in California as the largest source of GHG emissions in 2004, accounting for 81 percent of the

²⁹ California Air Resources Board. *California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*. November 16, 2007.

³⁰ United Nations Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF," http://unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/time_series_annex_i/items/3841.php.

total GHG emissions.³¹ CO₂ emissions from other sources contributed 2.8 percent of the total GHG emissions, methane emissions 5.7 percent, nitrous oxide emissions 6.8 percent, and the remaining 2.9 percent was composed of emissions of high-GWP gases.³² These high GWP gases are largely composed of refrigerants and a small contribution of sulfur hexafluoride (SF₆) used as insulating materials in electricity transmission and distribution.

The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources; industry; agriculture and forestry; and other sources, which include commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions are presented in **Table 5.2-2, GHG Sources in California**.

**Table 5.2-2
GHG Sources in California¹**

Source Category	Annual GHG Emissions (MMTCO₂E)^a	Percent of Total	Annual GHG Emissions (MMTCO₂E)^b	Percent of Total
Agriculture	27.9	5.8%	27.9	6.6%
Commercial Uses	12.8	2.6%	12.8	3.0%
Electricity Generation	119.8	24.7%	58.5	13.8%
Forestry (excluding sinks)	0.2	0.0%	0.2	0.0%
Industrial Uses	96.2	19.9%	96.2	22.7%
Residential Uses	29.1	6.0%	29.1	6.9%
Transportation	182.4	37.7%	182.4	43.1%
Other ^c	16.0	3.3%	16.0	3.8%
Totals	484.4	100.0%	423.1	100.0%

Sources:

¹ California Air Resources Board. *California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*. November 16, 2007.

^a Includes emissions associated with imported electricity, which account for 61.3 MMTCO₂E annually.

^b Excludes emissions associated with imported electricity.

^c Unspecified combustion and use of ozone-depleting substances.

It should be noted that emissions from each of these economic sectors are not confined to emissions from a single process, since there is crossover with other sectors. For example, the GHG emissions from cement production places clinker manufacturing (a specific process in cement production) in its own category and the fuel used to heat the cement production process within the industrial fuel category. In the case of

³¹ California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*.

³² California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*.

landfills, methane emissions and CO₂ emissions and sinks are reported in their respective portions of the inventory. Taken together, the CO₂ sinks approximately offset the landfill methane emissions. Additionally, fuel-related GHG emissions from transporting wastes to landfills are included in transportation fuels.

Global Climate Change

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer).³³ Climate change may result from

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

Indications of Anthropogenic Influences

The impact of anthropogenic activities on global climate change is readily apparent in the observational record. For example, surface temperature data shows that 11 of the 12 years from 1995 to 2006 rank among the 12 warmest since 1850, the beginning of the instrumental record for global surface temperature.³⁴ In addition, the atmospheric water vapor content has increased since at least the 1980s over land, sea, and in the upper atmosphere, consistent with the capacity of warmer air to hold more water vapor; ocean temperatures are warmer to depths of 3,000 feet; and a marked decline has occurred in mountain glaciers and snow pack in both hemispheres, polar ice and ice sheets in both the arctic and antarctic regions.³⁵

Influence of Industrialization

Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of carbon dioxide, methane, and nitrous oxide from before the start of the industrialization, around 1750, to over 650,000 years ago. For that period, it was found that carbon

³³ United States Environmental Protection Agency, Glossary of Climate Change Terms. <http://www.epa.gov/climatechange/glossary.html#Climate_change>.

³⁴ Intergovernmental Panel on Climate Change. Climate Change 2007: The Physical Science Basis, Summary for Policymakers. February 2007. <http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf>.

³⁵ Intergovernmental Panel on Climate Change, "Climate Change 2007."

dioxide concentrations ranged from 180 ppm to 300 ppm. For the period from around 1750 to the present, global carbon dioxide concentrations increased from a pre-industrialization period concentration of 280 ppm to 379 ppm in 2005, with the 2005 value far exceeding the upper end of the pre-industrial period range.³⁶ Global methane and nitrous oxide concentrations show similar increases for the same period (see **Table 5.2-3, Comparison of Global Pre-Industrial and Current GHG Concentrations**).

**Table 5.2-3
Comparison of Global Pre-Industrial and Current GHG Concentrations¹**

Greenhouse Gas	Early Industrial Period Concentrations (ppm)	Natural Range for Last 650,000 Years (ppm)	2005 Concentrations (ppm)
Carbon Monoxide	280	180 to 300	379
Methane	715	320 to 790	1774
Nitrous Oxide	270	NA	319

¹ Intergovernmental Panel on Climate Change. *Climate Change 2007: The Physical Science Basis, Summary for Policymakers*. February 2007.

Effects of Global Climate Change

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2° Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005.³⁷ Climate change modeling using 2000 emission rates shows that further warming would occur, which would induce further changes in the global climate system during the current century.³⁸ Changes to the global climate system and ecosystems and to California would include, but not be limited to

- the loss of sea ice and mountain snow pack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;³⁹
- rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps, the Greenland and Antarctic ice sheets;⁴⁰

³⁶ Intergovernmental Panel on Climate Change, "Climate Change 2007."

³⁷ Intergovernmental Panel on Climate Change, "Climate Change 2007."

³⁸ Intergovernmental Panel on Climate Change, "Climate Change 2007."

³⁹ Intergovernmental Panel on Climate Change, "Climate Change 2007."

⁴⁰ Intergovernmental Panel on Climate Change, "Climate Change 2007."

- changes in weather that include, widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic and aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;⁴¹
- decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;⁴²
- increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century;⁴³ and
- high potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level.⁴⁴

Regulatory Agencies and Responsibilities

Air quality within the basin is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy making, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the basin are discussed below along with their individual responsibilities.

US Environmental Protection Agency

The US EPA is responsible for enforcing the federal Clean Air Act (CAA) and the National Ambient Air Quality Standards (NAAQS) that it establishes. These standards identify levels of air quality for seven "criteria" pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The seven criteria pollutants include O₃, CO, NO₂, sulfur dioxide (SO₂), PM₁₀, PM_{2.5}, and lead. The NAAQS (other than O₃, PM₁₀, PM_{2.5}, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O₃, PM₁₀, and PM_{2.5} are based on statistical calculations over one to three year periods, depending on the pollutant. The US EPA also has regulatory and enforcement jurisdiction

⁴¹ Intergovernmental Panel on Climate Change, "Climate Change 2007."

⁴² California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature* (Executive Summary). March 2006.

⁴³ California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and Legislature*.

⁴⁴ California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and Legislature*.

over emission sources beyond state waters (outer continental shelf), and those that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.⁴⁵

In response to its enforcement responsibilities, the US EPA requires each state to prepare and submit a State Implementation Plan (SIP) that describes how the state will achieve the federal standards by specified dates. The extent of the SIP depends on the severity of the air quality within the state or air basin. The South Coast Air Basin is classified by the US EPA as a severe-17 nonattainment area for the 8-hour ozone standard,⁴⁶ a serious nonattainment area for PM₁₀,⁴⁷ and a nonattainment area for PM_{2.5}.⁴⁸ Severe-17 nonattainment areas have an attainment date of June 15, 2021, to comply with the 8-hour ozone standard. The South Coast Air Basin is required to meet attainment for the federal PM_{2.5} standard by 2010; however, the SCAQMD will be filing for a five-year extension to 2015. The South Coast is designated as attainment for the federal CO and NO₂ standards. The status of the basin with respect to NAAQS attainment is summarized in **Table 5.2-4, National Ambient Air Quality Standards and Status – South Coast Air Basin.**

Under the compliance timetables in the 1990 Amendments to the CAA that pertain to ozone, the basin was originally to achieve attainment status for ozone within 20 years (i.e., by November 15, 2010). To do so, the basin was to show a 15 percent reduction from its 1990 basin-wide emissions inventory within six years from the enactment date of the CAA, and a 3 percent annual reduction thereafter for the remainder of the 20 years. The SCAQMD's 2007 AQMP, which was adopted by the Governing Board in June 2007, focuses on attainment strategies for the new 8-hour ozone standard. For the other nonattainment pollutants, the basin must achieve attainment status by the most expeditious date that can be achieved, but no later than five years from the date the area was designated nonattainment. If the basin

⁴⁵ South Coast Air Quality Management District, *Air Quality Analysis Guidance Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 2001), p. 2-2. This document may be reviewed on-line at <http://www.aqmd.gov/ceqa/hdbk.html>.

⁴⁶ US Environmental Protection Agency. "8-Hour Ozone Areas Listed by Category/Classification as of September 27, 2004." [Online] 26 October 2004. <<http://www.epa.gov/air/oaqps/greenbk/gnc.html>>. On April 30, 2004, the EPA published designations of nonattainment areas with respect to the 8-hour ozone standard. The Basin was designated as "severe-17" nonattainment for the purposes of this standard. Severe-17 nonattainment areas have an attainment date of June 15, 2021 (17 years after the effective date of the designation) to comply with the 8-hour ozone standard. This designation commences a new round of planning to demonstrate compliance with the 8-hour standard.

US Environmental Protection Agency. "Green Book 8-Hour Ozone Non-Attainment Areas." [Online] 26 October 2004. <<http://www.epa.gov/air/oaqps/greenbk/ca8.html>>.

⁴⁷ US Environmental Protection Agency. "Carbon Monoxide Nonattainment Area Map." [Online] 26 October 2004. <<http://www.epa.gov/air/oaqps/greenbk/losangc.html>>.

US Environmental Protection Agency. "Particulate Matter Nonattainment Area Map." [Online] 26 October 2004. <<http://www.epa.gov/air/oaqps/greenbk/mappm10.html>>.

US Environmental Protection Agency. "Particulate Matter Nonattainment Areas as of September 27, 2004." [Online] 26 October 2004. <<http://www.epa.gov/air/oaqps/greenbk/pntc.html>>.

⁴⁸ US Environmental Protection Agency. "Air Quality Designations and Classifications for the Fine Particles (PM_{2.5}) National Ambient Air Quality Standards." *Federal Register*, January 5, 2004, pg. 943-1019.

experiences difficulty doing so, the US EPA may extend the period for attainment for an additional 10 years. The basin has met the federal standards for both NO_x and CO.⁴⁹ A more detailed discussion of the SCAQMD 2007 AQMP is provided below.

Table 5.2-4
National Ambient Air Quality Standards and Status
South Coast Air Basin (Los Angeles County)

Pollutant	Averaging Time	Designation/Classification
Ozone (O ₃)	8 Hour	Nonattainment/Severe 17
Carbon Monoxide (CO)	1 Hour, 8 Hour	Attainment
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	Attainment/Unclassifiable
Sulfur Dioxide (SO ₂)	24 Hour, Annual Arithmetic Mean	Attainment
Respirable Particulate Matter (PM ₁₀)	24 Hour	Nonattainment/Serious
Fine Particulate Matter (PM _{2.5})	24 Hour, Annual Arithmetic Mean	Nonattainment
Lead (Pb)	Calendar Quarter	Attainment

Source: Environmental Protection Agency. "Region 9: Air Programs, Air Quality Maps." http://www.epa.gov/region9/air/maps/maps_top.html.

On September 21, 2006, the US EPA announced revisions to the PM₁₀ and PM_{2.5} NAAQS. The US EPA announced a more stringent 24-hour PM_{2.5} standard of 35 µg/m³ in place of the previous 65 µg/m³ standard. As well, the annual average PM₁₀ standard was revoked based on the findings that "the available evidence does not suggest an association between long-term exposure to coarse particles at current ambient levels and health effects." The 24-hour PM₁₀ standard was retained at 150 µg/m³. These revisions became effective December 18, 2006. The US EPA will assign area designations for the new PM_{2.5} standard by November 2009, and they will become effect in April 2010. Air basins must meet the new 24-hour PM_{2.5} standard by April 2015 with a possible five-year extension to 2020. The SCAQMD's 2007 AQMP addresses attainment strategies for the new PM_{2.5} standard.

California Air Resources Board

The California Air Resources Board (CARB), a branch of the Cal/EPA, oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the California Clean Air Act (CCAA), responding to the federal CAA requirements to establish state ambient air quality standards, and for regulating emissions from motor vehicles and consumer products within the state. CARB has established emission standards for vehicles sold in California and for other emission sources,

⁴⁹ South Coast Air Quality Management District. 2003 *Air Quality Management Plan*. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, p. ES-9.

such as consumer products and certain off-road equipment. It also sets passenger vehicle fuel specifications to further reduce vehicular emissions.⁵⁰

The CCAA established a legal mandate to achieve California Ambient Air Quality Standards (CAAQS) by the earliest practicable date. These standards apply to the same criteria pollutants as the NAAQS, and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride. The California ambient air quality standards are more stringent than the federal standards and, in the case of PM₁₀ and SO₂, far more stringent. Air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for O₃, CO, SO₂, NO₂, PM₁₀, PM_{2.5}, and visibility reducing particles are not exceeded and all other standards are not equaled or exceeded at any time in any consecutive three-year period.

In 1997, after receiving the new US EPA standards, CARB and Office of Environmental Health Hazard Assessment staff reviewed the scientific literature on the health effects of exposure to particulate matter, and recommended lowering the existing state standard for PM₁₀ and adopting a lower standard for PM_{2.5}.⁵¹ Staff specifically recommended that the annual average standard for PM₁₀ be lowered from 30 µg/m³ to 20 µg/m³ (the 24-hour average standard of 50 µg/m³ for PM₁₀ would be retained), and that the new annual average standard for PM_{2.5} in California be established at 12 µg/m³, which is less than the federal standard of 15 µg/m³ (see 17 Cal. Code Regs. Section 70200). These standards were adopted by CARB in June 2002, approved by the Office of Administrative Law (OAL) on June 5, 2003, and became effective on July 5, 2003. CARB will also consider establishing a 24-hour PM_{2.5} state standard in the future; however, the timing of the adoption of this latter standard is currently unknown. The state PM₁₀ and PM_{2.5} standards have been retained and were not affected by the change in the NAAQS for PM₁₀ and PM_{2.5}. The South Coast Air Basin is currently designated as nonattainment for the state PM₁₀ and PM_{2.5} standards.

Health and Safety Code Section 39607(e) requires CARB to establish and periodically review area designation criteria. These designation criteria provide the basis for CARB to designate areas of the state as "attainment," "nonattainment," "nonattainment-transitional," or "unclassified" for the state standards. In addition, Health and Safety Code Section 39608 requires CARB to use the designation criteria to designate areas of California and to annually review those area designations. CARB makes area designations for 10 criteria pollutants: O₃, CO, NO₂, SO₂, PM_{2.5}, PM₁₀, sulfates, lead, hydrogen sulfide, and

⁵⁰ South Coast Air Quality Management District, *Air Quality Analysis Guidance Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 2001), p. 2-2. This document may be reviewed on-line at <<http://www.aqmd.gov/ceqa/hdbk.html>>.

⁵¹ California Air Resources Board. "Review of the Ambient Air Quality Standards for Particulate Matter and Sulfates; Standards Review Schedule." [Online] 16 June 2003. <<http://www.arb.ca.gov/research/aaqs/std-rs/std-rs.htm>>.

visibility-reducing particles.⁵² Currently, CARB has not established area designations for vinyl chloride,⁵³ however, CARB has identified vinyl chloride as a toxic air contaminant (TAC) with an undetermined threshold level of exposure for adverse health effects. Therefore, vinyl chloride is addressed on a project-by-project basis. As will be discussed below, this project is not expected to directly emit vinyl chloride or other California-specific criteria pollutants such as sulfates, lead, hydrogen sulfide, and visibility-reducing particles.

Currently, CARB has designated the basin as an extreme nonattainment area for ozone with respect to the 1-hour and 8-hour standards,⁵⁴ a nonattainment area for PM₁₀,⁵⁵ a nonattainment area for PM_{2.5},⁵⁶ attainment for CO and sulfates,⁵⁷ unclassified for visibility reducing particles and hydrogen sulfide,⁵⁸ and attainment for NO₂, SO₂, and lead.⁵⁹ CARB does not make area designations for vinyl chloride.⁶⁰ For areas classified as nonattainment, the CCAA requires that the SCAQMD prepare an air quality management plan with specific emission reduction strategies, and to meet specified milestones for implementing emission controls to achieve more healthful air. New control strategies are to include an indirect and area source control program, best available retrofit control technology for existing sources, a program to mitigate all emissions from new and modified permitted stationary sources (no net increase), transportation control measures, and substantial use of low-emission vehicles (e.g., natural gas-powered

⁵² California Air Resources Board. "Area Designations (Activities and Maps)." [Online] 29 September 2006. <<http://www.arb.ca.gov/desig/desig.htm>>. Written communication with Marcy Nystrom, California Air Resources Board, December 24, 2003, stating that state law requires CARB to make area designations for pollutants with state standards listed in Title 17 of the California Code of Regulations, Section 70200. However, vinyl chloride is not included in this section of the California Code of Regulations; therefore, CARB does not make area designations for vinyl chloride.

⁵³ California Air Resources Board. "Area Designations (Activities and Maps)." [Online] 29 September 2006. <<http://www.arb.ca.gov/desig/desig.htm>>.

⁵⁴ California Air Resources Board. "State Area Designation Map: Ozone." [Online] 28 December 2006. <<http://www.arb.ca.gov/desig/adm/adm.htm>>. At the time of this writing, CARB has not yet made area designations for the state 8-hour standard. Designations are expected to be equal to or worse than the existing 1-hour ozone standard designation.

⁵⁵ California Air Resources Board. "State Area Designation Map: PM₁₀." [Online] 28 December 2006. <<http://www.arb.ca.gov/desig/adm/adm.htm>>.

⁵⁶ California Air Resources Board. "State Area Designation Map: PM_{2.5}." [Online] 28 December 2006. <<http://www.arb.ca.gov/desig/adm/adm.htm>>.

⁵⁷ California Air Resources Board. "State Area Designation Map: Sulfates." [Online] 28 December 2006. <<http://www.arb.ca.gov/desig/adm/adm.htm>>.

⁵⁸ California Air Resources Board. "State Area Designation Map: Hydrogen Sulfide." [Online] 28 December 2006. <<http://www.arb.ca.gov/desig/adm/adm.htm>>.

⁵⁹ California Air Resources Board. "Area Designation Maps/State and Federal." [Online] 28 December 2006. <<http://www.arb.ca.gov/desig/adm/adm.htm>>.

⁶⁰ The Health and Safety Code Section 39607 (e) specifies CARB to make designations for those pollutants set forth in CCR, Title 17, Section 70200. The vinyl chloride standard is set forth in Section 70200.5. CARB abides with the strict interpretation and makes area designations only for those pollutants in Section 70200.

or hybrid vehicles). The CCAA also requires control measures to be ranked by priority and cost effectiveness. The air quality management plans must achieve a reduction in emissions of 5 percent or more per year, or 15 percent or more in a three-year period for pollutants causing severe nonattainment. The status of the basin with respect to the CAAQS is summarized in **Table 5.2-5, California Ambient Air Quality Standards and Status – South Coast Air Basin.**

**Table 5.2-5
California Ambient Air Quality Standards and Status
South Coast Air Basin**

Pollutant	Averaging Time	Designation/Classification
Ozone (O ₃)	1 Hour, 8 Hour	Nonattainment ¹
Carbon Monoxide (CO)	1 Hour, 8 Hour	Attainment
Nitrogen Dioxide (NO ₂)	1 Hour	Attainment
Sulfur Dioxide (SO ₂)	1 Hour, 24 Hour	Attainment
Respirable Particulate Matter (PM ₁₀)	24 Hour, Annual Arithmetic Mean	Nonattainment
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	Nonattainment
Lead (Pb) ²	30 Day Average	Attainment
Sulfates (SO ₄)	24 Hour	Attainment
Hydrogen Sulfide (H ₂ S)	1 Hour	Unclassified
Vinyl Chloride ²	24 Hour	Unclassified
Visibility Reducing Particles	8 Hour (10 AM–6 PM)	Unclassified

Source: California Air Resources Board. "Area Designations Maps/State and National." <http://www.arb.ca.gov/design/adm/adm.htm>

¹ CARB has not issued area classifications based on the new state 8-hour standard. The previous classification for the 1-hour ozone standard was Extreme.

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

In the early 1980s, CARB established one of the nation's first comprehensive state air toxics programs. The Toxic Air Contaminant Identification and Control Act (AB 1807-1983), Health and Safety Code Section 36950, et seq. created California's program to reduce the health risks from air toxics. This law expanded CARB's authority to evaluate and control air toxics.

An additional state law, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588-1987) Health and Safety Code Section 44300, et seq.), supplements the original legislation by requiring a statewide air toxics inventory and notification of local residents of significant risk from nearby sources of air toxics. A 1992 amendment to the law (SB 1731; Health and Safety Code Section 44390, et seq.) requires that the risk be reduced from these significant sources.

The goal of CARB's air toxics program is to protect the public health. It does this by reducing TACs that pose the highest risk to Californians. CARB's program involves two separate steps. During the first step, risk assessment, CARB identifies the highest risk substances (i.e., TACs). In the second, or risk management step, CARB and local air pollution control districts (APCDs), such as the SCAQMD, investigate and adopt measures requiring air sources of TACs to minimize risk to public health. CARB maintains summaries and historical trends of TACs throughout the state, including the basin.⁶¹

Southern California Association of Governments

SCAG is a council of governments for the Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. As a regional planning agency, SCAG serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG also serves as the regional clearinghouse for projects requiring environmental documentation under federal and state law. In this role, SCAG reviews projects to analyze their impacts on SCAG's regional planning efforts.

Although SCAG is not an air quality management agency, it is responsible for several air quality planning issues. Specifically, as the designated Metropolitan Planning Organization (MPO) for the Southern California region, it is responsible, pursuant to Section 176(c) of the 1990 amendments to the CAA, for providing current population, employment, travel, and congestion projections for regional air quality planning efforts. It is required to quantify and document the demographic and employment factors influencing expected transportation demand, including land use forecasts. Pursuant to California Health and Safety Code Section 40460(b), SCAG is also responsible for preparing and approving the portions of the basin's air quality management plans relating to demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. SCAG's method of accomplishing these requirements is through the preparation of demographic projections published in its 2004 RTP,⁶² which was used by the SCAQMD in the preparation of its 2007 AQMP,⁶³ discussed below.

⁶¹ California Air Resources Board. "Air Quality Data Statistics." [Online] 15 February 2007. <http://www.arb.ca.gov/adam/welcome.html>.

⁶² The (modified) 2004 RTP, which was used as the basis for the 2007 AQMP, is incorporated by reference.

⁶³ South Coast Air Quality Management District. 2007 Air Quality Management Plan. [Online] May 19, 2008. <http://www.aqmd.gov/aqmp/07aqmp/aqmp/Chapter_3.pdf >, p. 3-11. The 2007 AQMP specifically states, "Demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industries), developed by SCAG for their interim 2007 RTP, were used in the modified 2004 RTP to estimate future emissions."

South Coast Air Quality Management District

The management of air quality in the basin is the responsibility of the SCAQMD. This responsibility was given to SCAQMD by the California Legislature's adoption of the 1977 Lewis-Presley Air Quality Management Act (Health and Safety Code Section 40400, et seq.), which merged four county air pollution control bodies into one regional district. Under the act, SCAQMD is responsible for bringing air quality in the areas under its jurisdiction into conformity with federal and state air quality standards. Specifically, SCAQMD is responsible for monitoring ambient air pollutant levels throughout the basin and for developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards.

SCAQMD 2007 AQMP

The SCAQMD has published the Draft Final 2007 AQMP, which was adopted by the SCAQMD Governing Board on June 1, 2007. The purpose of the 2007 AQMP for the basin (and those portions of the Salton Sea Air Basin under the SCAQMD's jurisdiction) is to set forth a comprehensive program that will lead these areas into compliance with federal and state air quality planning requirements for ozone and PM_{2.5}. In addition, as part of the 2007 AQMP, the SCAQMD is requesting US EPA's approval of a "bump-up" to the "extreme" nonattainment classification for the basin, which would extend the attainment date to 2024 and allow for the attainment demonstration to rely on emission reductions from measures that anticipate the development of new technologies or improvement of existing control technologies. Although PM_{2.5} plans for nonattainment areas were due in April 2008, the 2007 AQMP also focuses on attainment strategies for the PM_{2.5} standard through stricter control of sulfur oxides, directly emitted PM_{2.5}, NO_x, and VOCs. The need to commence PM_{2.5}-control strategies before April 2008 was due to the initial attainment date for PM_{2.5} (2010) being much earlier than that for ozone (2021 for the current designation of severe-17 or 2024 for the extreme designation). However, the 2007 AQMP determined that the basin will not be able to meet the 2010 deadline and the SCAQMD plans to request a five-year extension from US EPA. The new attainment date for PM_{2.5} would be April 2015. Control measures and strategies for PM_{2.5} will also help control ozone generation in the region because PM_{2.5} and ozone share similar precursors (e.g., NO_x). The District has integrated PM_{2.5} and ozone reduction control measures and strategies in the 2007 AQMP. In addition, the AQMP focuses on reducing VOC emissions, which have not been reduced at the same rate as NO_x emissions in the past. Hence, the basin has not achieved the reductions in ozone as were expected in previous plans. The AQMP was based on assumptions provided by both CARB and SCAG in the new EMFAC2007 motor vehicle model and the most recent demographics information, respectively.

SCAQMD Rules and Regulations

The SCAQMD is responsible for limiting the amount of emissions that can be generated throughout the basin by various stationary, area, and mobile sources. Specific rules and regulations have been adopted by the SCAQMD Governing Board that limit the emissions that can be generated by various uses and/or activities, and that identify specific pollution reduction measures which must be implemented in association with various uses and activities. These rules not only regulate the emissions of the federal and state criteria pollutants, but also TACs and acutely hazardous materials.⁶⁴ The rules are subject to ongoing refinement by SCAQMD.

In particular, stationary emissions sources subject to these rules are regulated through SCAQMD's permitting process. Through this permitting process, SCAQMD also monitors the amount of stationary emissions being generated and uses this information in developing the AQMP. The proposed project would be subject to SCAQMD rules and regulations to reduce specific emissions and to mitigate potential air quality impacts.

- **Rule 403 (Fugitive Dust)** – This rule requires fugitive dust sources to implement Best Available Control Measures for all sources and all forms of visible particulate matter are prohibited from crossing any property line. SCAQMD Rule 403 is intended to reduce PM₁₀ emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust (see also Rule 1186).
- **Rule 1113 (Architectural Coatings)** – This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.
- **Rule 1121 (Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters)** – This rule prescribes NO_x emission limits for natural gas-fired water heaters with heat input rates less than 75,000 Btu per hour. It applies to manufacturers, distributors, retailers, and installers of natural gas-fired water heaters. In lieu of meeting these NO_x limits, this rule allows emission mitigation fees to be collected from water heater manufacturers to fund stationary and mobile source emission reduction projects targeted at offsetting NO_x emissions from water heaters that do not meet Rule 1121 emission standards.
- **Rule 1146.2 (Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters)** – This rule requires manufacturers, distributors, retailers, refurbishers, installers

⁶⁴ Assembly Bill 1807 (AB 1807) (Stats. 1983, Ch. 1047; Health and Safety Code Section 39650, et seq., Food and Agriculture Code Section 14021, et seq.), enacted in September 1983, sets forth a procedure for the identification and control of TAC in California. According to those statutes, CARB is responsible for the identification and control of TACs, as discussed above. AB 1807 defines a TAC as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health (Health and Safety Code Section 39655a). California Air Resources Board. "Toxic Air Contaminant Staff Report/Executive Summaries." 2 February 2004. <<http://www.arb.ca.gov/toxics/summary/summary.htm>>.

and operators of new and existing units to reduce NO_x emissions from natural gas-fired water heaters, boilers, and process heaters as defined in this rule.

- **Rule 1186 (PM₁₀ Emissions from Paved and Unpaved Roads, and Livestock Operations)** – This rule applies to owners and operators of paved and unpaved roads and livestock operations. The rule is intended to reduce PM₁₀ emissions by requiring the cleanup of material deposited onto paved roads, use of certified street sweeping equipment, and treatment of high-use unpaved roads (see also Rule 403).

SCAQMD's CEQA Air Quality Handbook

In April 1993, the SCAQMD prepared its *CEQA Air Quality Handbook* to assist local government agencies and consultants in preparing air quality impact analyses for projects subject to CEQA. It was later updated in November 1993 and is presently being updated by the district. The *CEQA Air Quality Handbook* is an advisory document and local jurisdictions are not required to utilize the methodology outlined therein, but it does describe the criteria that SCAQMD uses when reviewing and commenting on the adequacy of environmental documents, such as this EIR. It recommends thresholds for determining whether or not projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies mitigation measures to avoid or reduce air quality impacts. Although the *CEQA Air Quality Handbook* has been adopted by the Governing Board of the SCAQMD, it does not, nor does it intend to, supersede a local jurisdiction's CEQA procedures.

As of June 2007, the *CEQA Air Quality Handbook* was still undergoing revision. However, the air quality significance thresholds have been revised, and a new procedure referred to as localized significance thresholds has been added. The *CEQA Air Quality Handbook* and these revised methodologies were used in preparing the air quality analysis in this EIR section.

Santa Clarita Subregional Analysis

In November 2004, the SCAQMD prepared a subregional analysis for the Santa Clarita Valley. The purpose of a subregional analysis is to identify disproportionate air quality impacts in a specific geographic area, and if found, to address and mitigate these impacts. With regard to future development, the analysis concluded that

- when simultaneous 25-year buildout of all recorded, pending and approved land parcels in the City and County portions of the valley is assumed, the simulated annual PM₁₀ impact is projected to increase up to 5 µg/m³;
- the maximum regional annual average PM₁₀ impact is projected to occur near the Newhall Ranch area; and

- future development would not cause violations of the federal annual average PM₁₀ standard, but could cause possible violations of the state standard.

The overwhelming contribution of pollution transported to the Santa Clarita Valley comes from the San Fernando Valley and metropolitan Los Angeles. The major daytime wind vectors are from the south and upwind emission source areas. Additionally, field studies have confirmed the prevalent transport route through the Newhall Pass by tracing the northward movement of inert tracer gases released in the Metropolitan Los Angeles areas. As an example, Santa Clarita is a relatively small contributor to the total emissions of the key pollutants in both Los Angeles County and the basin as a whole. The report indicates that across the board, the emissions are typically less than 3 percent of the County total and 2 percent of the basin total.

Local Governments

Local governments, such as the City of Santa Clarita, have the authority and responsibility to reduce air pollution through their police power and land use decision-making authority. Specifically, local governments are responsible for the mitigation of emissions resulting from land use decisions and for the implementation of transportation control measures as outlined in the 2007 AQMP. The 2007 AQMP assigns local governments certain responsibilities to assist the basin in meeting air quality goals and policies. In general, a first step toward implementing a local government's responsibility is accomplished by identifying air quality goals, policies, and implementation measures in its general plan. Through capital improvement programs, local governments can fund infrastructure that contributes to improved air quality, by requiring such improvements as bus turnouts, energy-efficient street lights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, local governments assess the air quality impacts of projects they undertake or that occur within their jurisdictions, require mitigation of potential air quality impacts by conditioning discretionary permits, and monitor and enforce implementation of such mitigation.⁶⁵

⁶⁵ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, April 1993), p. 2-2; *Guidance Handbook* (July 1999) pp. 2-8-2-10. The *Guidance Handbook* may be reviewed on-line at <http://www.aqmd.gov/ceqa/hdbk.html>.

Greenhouse Gas Regulatory Programs

International Activities

Kyoto Protocol

The original Kyoto Protocol was negotiated in December 1997 and came into force on February 16, 2005. As of April 2008, 180 countries have ratified the agreement.⁶⁶ Notably, however, the US has not ratified the protocol. Participating nations are separated into Annex 1 (i.e., industrialized countries) and Non-Annex 1 (i.e., developing countries) countries that have different requirements for GHG reductions. The goal of the protocol is to achieve overall emissions reduction targets for six GHGs by the period 2008 to 2012. The six GHGs regulated under the protocol are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, HFCs, and PFCs. Each nation has an emissions reduction target for which they must reduce GHG emissions a certain percentage below 1990 levels (e.g., 8 percent reduction for the European Union, 6 percent reduction for Japan). The average reduction target for nations participating in the Kyoto Protocol is approximately 5 percent below 1990 levels.⁶⁷ Although the United States has not ratified the protocol, it has established an 18 percent reduction in GHG emissions intensity by 2012.⁶⁸ Greenhouse gas intensity is the ratio of GHG emissions to economic output (i.e., gross domestic product).

Intergovernmental Panel on Climate Change

The World Meteorological Organization (WMO) and United Nations Environmental Program (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988. The goal of the IPCC is to evaluate the risk of climate change caused by human activities. Rather than performing research or monitoring climate, the IPCC relies on peer-reviewed and published scientific literature to make its assessment. The IPCC assesses information (i.e., scientific literature) regarding human-induced climate change, impacts of human-induced climate change, and options for adaptation and mitigation of climate change. The IPCC reports its evaluation through special reports called “assessment reports.” The latest assessment report (i.e., Fourth Assessment Report, consisting of three working group reports and a synthesis report based on the first three reports) was published in 2007.⁶⁹

⁶⁶ United Nations Framework Convention on Climate Change. Status of Ratification. <http://unfccc.int/kyoto_protocol/background/status_of_ratification/items/2613.php>

⁶⁷ Pew Center on Global Climate Change. Bush Policy vs. Kyoto. <http://www.pewclimate.org/what_s_being_done/in_the_world/bush_intensity_targe_2.cfm>

⁶⁸ The White House. Addressing Global Climate Change. March 9, 2007. <<http://www.whitehouse.gov/ceq/global-change.html>>.

⁶⁹ The IPCC's Fourth Assessment Report is available online at <http://www.ipcc.ch/>.

Federal Activities

In *Massachusetts vs. EPA*, the Supreme Court held that US EPA has the statutory authority under Section 202 of the CAA to regulate GHGs from new motor vehicles. The court did not hold that the USEPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs from motor vehicles cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Upon the final decision, President Bush signed Executive Order 13432 on May 14, 2007, directing the US EPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision. The order requires the US EPA to coordinate closely with other federal agencies and to consider the president's Twenty-in-Ten plan in this process. The Twenty-in-Ten plan would establish a new alternative fuel standard that would require the use of 35 billion gallons of alternative and renewable fuels by 2017. The US EPA will be working closely with the Department of Transportation in developing new automotive efficiency standards.

California Activities

Assembly Bill 1493

In a response to the transportation sector accounting for more than half of California's CO₂ emissions, Assembly Bill 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set the GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. In setting these standards, CARB must consider cost-effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. CARB adopted the standards in September 2004. These standards are intended to reduce emissions of carbon dioxide and other greenhouse gases (e.g., nitrous oxide, methane). The new standards would phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22 percent in greenhouse gas emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30 percent. Some currently used technologies that achieve GHG reductions include small engines with superchargers, continuously variable transmissions, and hybrid electric drive.

In December 2004, these regulations were challenged in federal court by the Alliance of Automobile Manufacturers, who claimed that the law regulated vehicle fuel economy, a duty assigned to the federal government. The case had been put on hold by a federal judge in Fresno pending the US Supreme Court's

decision in *Massachusetts vs. EPA*. The US Supreme Court's ruling in favor of the state of Massachusetts has been discussed as a likely vindication of state efforts to control GHG emissions. In December 2007, Judge Ishii of the US District Court for the Eastern District dismissed the case by the Alliance of Automobile Manufacturers. However, before these regulations may go into effect, the US EPA must grant California a waiver under the federal CAA, which ordinarily preempts state regulation of motor vehicle emission standards. Following the issuance of the *Massachusetts vs. EPA* decision, the US EPA announced that it would decide whether to grant California a waiver by December 2007. On December 19, 2007, Stephen Johnson, the US EPA Administrator, denied the waiver citing the need for a national approach to reducing greenhouse gas emissions, the lack of a "need to meet compelling and extraordinary conditions," and the benefits to be achieved through the Energy Independence and Security Act of 2007.⁷⁰ The California Attorney General subsequently filed suit in January 2008 to overturn the administrator's decision.

Executive Order S-3-05

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The Secretary of the CalEPA is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agencies involved in the GHG reduction plan include Secretary of Business, Transportation and Housing Agency, Secretary of Department of Food and Agriculture, Secretary of Resources Agency, Chairperson of CARB, Chairperson of the Energy Commission, and the President of the Public Utilities Commission. Representatives from each of the aforementioned agencies comprise the Climate Action Team. The Climate Action Team is responsible for implementing global warming emissions reduction programs. In order to achieve these goals, the Climate Action Team is organized into two subgroups: the market-based options subgroup and the scenario analysis subgroup. The Cal/EPA secretary is required to submit a biannual progress report from the Climate Action Team to the governor and state legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and reporting possible mitigation and adaptation plans to combat these impacts. The Climate Action Team has fulfilled both of these report requirements through its March 2006 Climate Action Team Report to Governor Schwarzenegger and the legislature.⁷¹ Some strategies currently being implemented by state agencies include CARB introducing vehicle climate

⁷⁰ Letter to Governor Arnold Schwarzenegger from Stephen L. Johnson, December 19, 2007.

⁷¹ Climate Action Team, *Climate Action Team Report*.

change standards and diesel anti-idling measures, the Energy Commission implementing building and appliance efficiency standards, and the Cal/EPA implementing their green building initiative. The Climate Action Team also recommends future emission reduction strategies, such as using only low-GWP refrigerants in new vehicles, developing ethanol as an alternative fuel, reforestation, solar power initiatives for homes and businesses, and investor-owned utility energy efficiency programs. According to the report, implementation of current and future emission reduction strategies have the potential to achieve the goals set forth in Executive Order S-3-05.

Assembly Bill 32

In furtherance of the goals established in Executive Order S-3-05, the legislature enacted Assembly Bill 32 (AB 32, Nunez), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries with penalties for noncompliance.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. The foremost objective of CARB is to adopt regulations that require the reporting and verification of statewide GHG emissions. This program will be used to monitor and enforce compliance with the established standards. The first GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted. In order to advise CARB, it must convene an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee. In January 2008, the first deadline for AB 32, a statewide cap for 2020 emissions based on 1990 levels and mandatory reporting rules for significant sources of GHGs was required to be adopted. The following year (January 2009), CARB must adopt a scoping plan indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions.

The first action under AB 32 resulted in the adoption of a report listing early action greenhouse gas emission reduction measures on June 21, 2007. The early actions include three specific GHG control rules. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. These early action GHG reduction measures are to be adopted and enforced before January 1, 2010, along with 32 other climate-protecting measures CARB is developing between now and 2011. The report divides early actions into three categories:

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

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

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

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

- reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
- reduction of auxiliary engine emissions of docked ships by requiring port electrification;
- reduction of perfluorocarbons from the semiconductor industry;
- reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products);
- require that all tune-up, smog check and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency; and
- restriction on the use of sulfur hexafluoride (SF₆) from non-electricity sectors if viable alternatives are available.

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT

CO₂. The inventory revealed that in 1990 transportation, with 35 percent of the state's total emissions, was the largest single sector, followed by industrial emissions, 24 percent; imported electricity, 14 percent; in-state electricity generation, 11 percent; residential use, 7 percent; agriculture, 5 percent; and commercial uses, 3 percent.

In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of greenhouse gases for large facilities on December 6, 2007. The mandatory reporting regulations require annual reporting from the largest facilities in the state, which account for 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California. About 800 separate sources that fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 tons of carbon dioxide each year from on-site stationary combustion sources. Transportation sources, which account for 35 percent of California's total greenhouse gas emissions, are not covered by these regulations but will continue to be tracked through existing means. Affected facilities will begin tracking their emissions in 2008, to be reported beginning in 2009 with a phase-in process to allow facilities to develop reporting systems and train personnel in data collection. Emissions for 2008 may be based on best available emission data. Beginning in 2010, however, emissions reports will be more rigorous and will be subject to third-party verification. Verification will take place annually or every three years, depending on the type of facility.

SB 1368

Governor Schwarzenegger, just two days after signing AB 32, reiterated California's commitment to reducing GHGs by signing SB 1368. SB 1368 requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly-owned utilities. The CEC must adopt the standards on or before June 30, 2007. These standards must be consistent with the standards adopted by the Public Utilities Commission. This effort will help to protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low or lower than new combined-cycle natural gas plants, by requiring imported electricity to meet GHG performance standards in California and requiring that the standards be developed and adopted in a public process.

Executive Order S-1-07

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

California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The LCFS will apply to refiners, blenders, producers, and importers of transportation fuels and will use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods. The Executive Order requires the Secretary of the Cal/EPA to coordinate with actions of the CEC, CARB, the University of California, and other agencies to develop a protocol to measure the "life-cycle carbon intensity" of transportation fuels. CARB is anticipated to complete its review of the LCFS protocols no later than June 2007 and implement the regulatory process for the new standard by December 2008.

SB 97

In August 2007, as part of the legislation accompanying the state budget negotiations, the legislature enacted SB 97 (Dutton), which directs the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of greenhouse gas emissions. OPR is to develop proposed guidelines by July 1, 2009, and the Resources Agency is directed to adopt guidelines by January 1, 2010. Until such guidelines are promulgated, there is no guidance from OPR or other agencies regarding the analysis of greenhouse gas emissions in EIRs.

EXISTING CONDITIONS

Regional Climate⁷²

The regional climate significantly influences the air quality in the basin. Temperature, wind, humidity, precipitation, and even the amount of sunshine can influence the quality of the air within a particulate region. In addition, the basin is frequently subjected to an inversion layer that traps air pollutants. Temperature has an important influence on basin wind flow, pollutant dispersion, vertical mixing, and photochemistry.

Annual average temperatures throughout the basin vary from the low to middle 60 °F. However, due to decreased marine influence, the eastern portion of the basin shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the basin, with average minimum temperatures of 47°F in downtown Los Angeles and 36°F in San Bernardino. All portions of the basin have recorded maximum temperatures above 100°F.

Although the climate of the basin can be characterized as semi-arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. This shallow layer of sea air is an important

⁷² The information contained in this section, unless otherwise noted, primarily is derived from Appendix 8 to the *CEQA Air Quality Handbook*.

modifier of basin climate. Humidity restricts visibility in the basin, and the conversion of SO₂ to SO₄ is heightened in air with high relative humidity. The marine layer is an excellent environment for that conversion process, especially during the spring and summer months. The annual average relative humidity is 71 percent along the coast and 59 percent inland. Because the ocean effect is dominant, periods of heavy early morning fog are frequent and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast.

More than 90 percent of the basin's rainfall occurs from November through April (see **Table 5.2-6, Average Monthly Temperatures and Precipitation for Los Angeles International Airport, CA, 1961-1990**). Annual average rainfall varies from approximately 9 inches in Riverside to 14 inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thundershowers near the coast and slightly heavier shower activity in the eastern portion of the region and near the mountains. Rainy days comprise 5 to 10 percent of all days in the basin with the frequency being higher near the coast. The influence of rainfall on the contaminant levels in the basin is minimal. Although some wash-out of pollution would be expected with winter rains, air masses that bring precipitation of consequence are very unstable and provide excellent dispersion that masks wash-out effects. Summer thunderstorm activity affects pollution only to a limited degree. However, heavy clouds associated with summer storms minimize ozone production because of reduced sunshine and cooler temperatures.

Due to the generally clear weather, about three-quarters of available sunshine is received in the basin. Clouds absorb the remaining one-quarter. The ultraviolet portion of this abundant radiation is a key factor in photochemical reactions. On the shortest day of the year there are approximately 10 hours of possible sunshine, and approximately 14 hours on the longest day of the year. The percentage of cloud cover during daylight hours varies from 47 percent at Los Angeles International Airport (LAX) to 35 percent at Sanberg, a mountain location. The number of clear days also increases with distance from the coast: 145 days at LAX and 186 days at Burbank.⁷³ The basin typically receives much less sunshine during the first six months of the year than the last six months. This difference is attributed to the greater frequency of deep marine layers and the subsequent increase in stratus clouds during the spring and to the fact that the rainy season begins late in the year (November) and continues through early spring.

⁷³ 1999 Local Climatological Data, Annual Summary with Comparative Data, Los Angeles, California, International Airport. National Oceanic and Atmospheric Administration.

**Table 5.2-6
Average Monthly Temperatures and Precipitation for
Los Angeles International Airport, CA, 1961–1990**

Month	Mean Daily Temperatures (°F)		Mean Monthly Precipitation
	Maximum	Minimum	
January	65	47	2.40
February	66	49	2.51
March	65	50	1.98
April	68	53	0.72
May	69	56	0.14
June	72	60	0.03
July	75	63	0.01
August	76	64	0.15
September	76	63	0.31
October	74	59	0.34
November	71	52	1.76
December	66	48	1.66
	110 (high)	23 (low)	12.01 (total)

Source: 1999 Local Climatological Data, Annual Summary with Comparative Data, Los Angeles, California, International Airport.

The importance of wind to air pollution is considerable. The direction and speed of the wind determines the horizontal dispersion and transport of air pollutants. During the late autumn to early spring rainy season, the basin is subjected to wind flows associated with traveling storms moving through the region from the northwest. This period also brings 5 to 10 periods of strong, dry offshore winds (locally termed “Santa Anas”) each year. During the dry season, which coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, typified by a daytime onshore sea breeze and a nighttime offshore drainage wind. Summer wind flows are created by the pressure differences between the relatively cold ocean and the unevenly heated and cooled land surfaces that modify the general northwesterly wind circulation over Southern California. Nighttime drainage begins with the radiational cooling of the mountain slopes. Heavy, cool air descends the slopes and flows through the mountain passes and canyons as it follows the lowering terrain toward the ocean. Another characteristic wind regime in the basin is the “Catalina Eddy,” a low level cyclonic (counterclockwise) flow centered over Santa Catalina Island, which results in an offshore flow to the southwest. On most spring and summer days, some indication of an eddy is apparent in coastal sections.

The vertical dispersion of air pollutants in the basin is frequently restricted by the presence of a persistent temperature inversion in the atmospheric layers near the earth's surface. Normally, the temperature of the atmosphere decreases with altitude. However, when the temperature of the atmosphere increases with altitude, the phenomenon is termed an inversion. An inversion condition can exist at the surface or at any height above the ground. The bottom of the inversion, known as the mixing height, is the height of the base of the inversion.

In the basin, there are two distinct temperature inversion structures that control vertical mixing of air pollution. During the summer, warm, high-pressure descending (subsiding) air is undercut by a shallow layer of cool marine air. The boundary between these two layers of air is a persistent marine subsidence/inversion. This boundary prevents vertical mixing that effectively acts as an impervious lid to pollutants over the entire basin. The mixing height for this inversion structure is normally situated 1,000 to 1,500 feet above mean sea level.

A second inversion-type forms in conjunction with the drainage of cool air off the surrounding mountains at night followed by the seaward drift of this pool of cool air. The top of this layer forms a sharp boundary with the warmer air aloft and creates nocturnal radiation inversions. These inversions occur primarily in the winter when nights are longer and onshore flow is weakest. They are typically only a few hundred feet above mean sea level. These inversions effectively trap pollutants, such as NO_x and CO from vehicles, as the pool of cool air drifts seaward. Winter is, therefore, a period of high levels of primary pollutants along the coastline.

In general, inversions in the basin are lower before sunrise than during the daylight hours. As the day progresses, the mixing height normally increases as the warming of the ground heats the surface air layer. As this heating continues, the temperature of the surface layer approaches the temperature of the base of the inversion layer. When these temperatures become equal, the inversion layer's lower edge begins to erode and, if enough warming occurs, the layer breaks up. The surface layers are gradually mixed upward, diluting the previously trapped pollutants. The breakup of inversion layers frequently occurs during mid to late afternoon on hot summer days. Winter inversions usually break up by mid morning.

Other conditions possibly affecting regional climate include stratospheric ozone depletion and global warming. As is discussed in Chapter 3 of the *CEQA Air Quality Handbook*:

Stratospheric ozone depletion" refers to the slow destruction of naturally occurring ozone, which lies in the upper atmosphere (called the stratosphere) and which protects Earth from the damaging effects of solar ultraviolet radiation. Figure 3-4 illustrates these reactions.

Certain compounds, including chlorofluorocarbons (CFCs,) halons, carbon tetrachloride, methyl chloroform, and other halogenated compounds, accumulate in the lower atmosphere and then

gradually migrate into the stratosphere. In the stratosphere, these compounds participate in complex chemical reactions to destroy the upper ozone layer. Destruction of the ozone layer increases the penetration of ultraviolet radiation to the Earth's surface, a known risk factor that can increase the incidence of skin cancers and cataracts, contribute to crop and fish damage, and further degrade air quality.

Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. This layer of gases in the atmosphere functions much the same as glass in a greenhouse (i.e., both prevent the escape of heat). This is why global warming is also known as the "greenhouse effect." Gases responsible for global warming and their relative contribution to the overall warming effect are carbon dioxide (55 percent), CFCs (24 percent), methane (15 percent), and nitrous oxide (6 percent). It is widely accepted that continued increases in greenhouse gases will contribute to global warming although there is uncertainty concerning the magnitude and timing of the warming trend.

Global warming gases and ozone-depleting gases include, but are not limited to, the following:

- *Carbon dioxide. Carbon dioxide is caused by fossil fuel combustion in stationary and mobile sources. It contributes to the greenhouse effect, but not to stratospheric ozone depletion. In the basin, approximately 48 percent of carbon dioxide emissions come from transportation, residential and utility sources contribute approximately 13 percent each, 20 percent come from industry, and the remainder come from a variety of other sources.*
- *CFCs (chlorofluorocarbons). CFCs are emitted from blowing agents used in producing foam insulation. They are also used in air conditioners and refrigerators and as solvents to clean electronic microcircuits. CFCs are primary contributors to stratospheric ozone depletion and to global warming. Sixty-three percent of CFC emissions in the basin come from the industrial sector (SCAQMD 1991).*
- *Halons. Halons are used in fire extinguishers and behave as both ozone-depleting and greenhouse gases.*
- *HCFCs (Hydro-chlorofluorocarbons). HCFCs are solvents, similar in use and chemical composition to CFCs. The hydrogen component makes HCFCs more chemically reactive than CFCs, allowing them to break down more quickly in the atmosphere.*
- *Methane. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, and leaks in natural gas pipelines. It is a greenhouse gas and traps heat 40–70 times more effectively than carbon dioxide. In the basin, more than 50 percent of human-induced methane emissions come from natural gas pipelines, while landfills contribute 24 percent.*
- *1,1,1-trichloroethane. 1,1,1-trichloroethane or methyl chloroform is a solvent and cleaning agent commonly used by manufacturers. It is less destructive of the environment than CFCs or HCFCs, but its continued use will contribute to global warming and ozone depletion.⁷⁴*

⁷⁴ South Coast Air Quality Management District, *CEQA Air Quality Handbook (Revised)*, (Diamond Bar, California: South Coast Air Quality Management District, November 2001), p. 3–14.

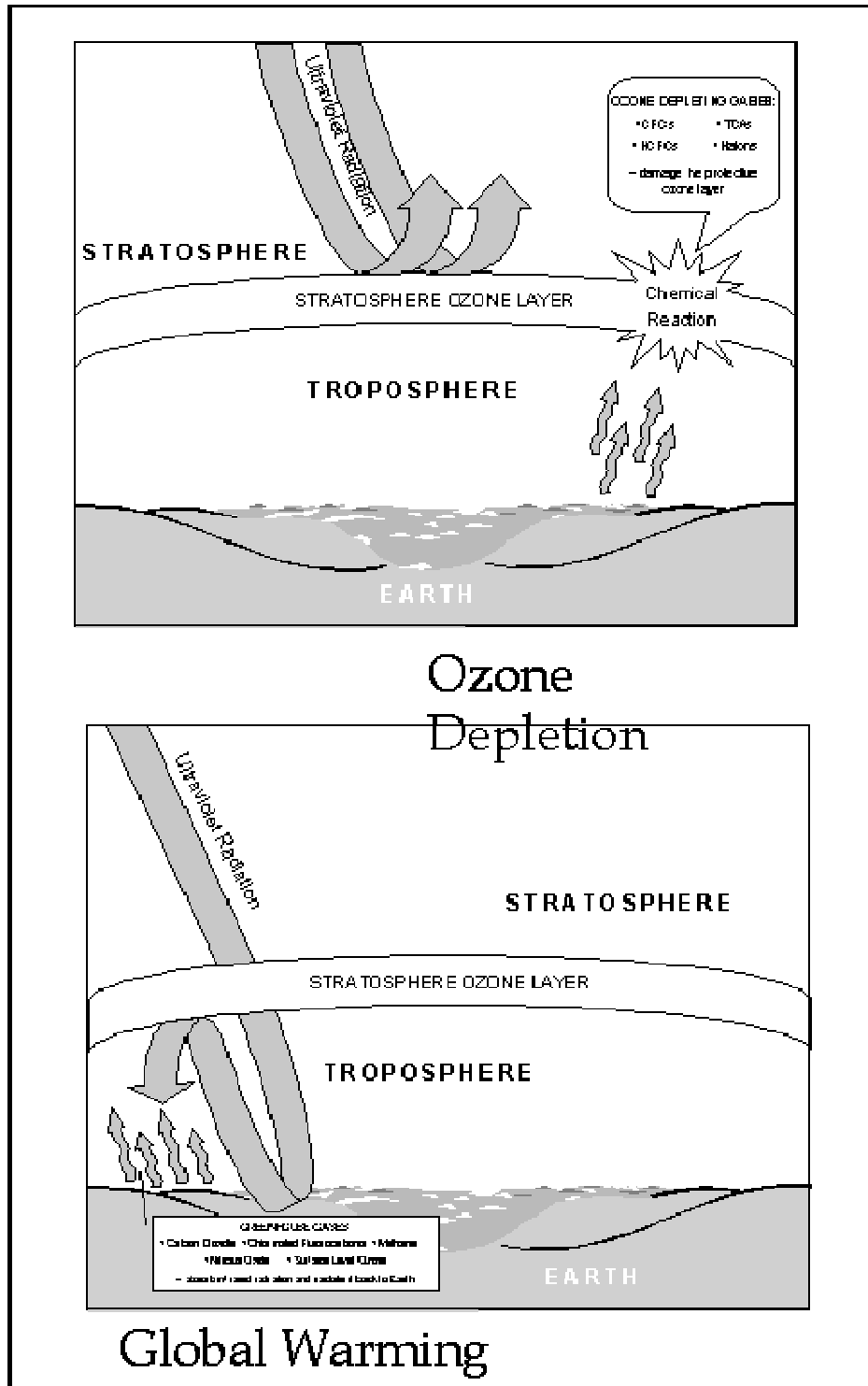


Figure 3-4
Stratospheric Ozone Depletion and Global Warming

Regional Air Quality

In this subsection, year 2006 regional air quality in the basin is compared to state and federal ambient air quality standards. The following information, unless otherwise noted, is primarily derived from the SCAQMD's Historical Data by Year which can be found on their website.⁷⁵

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the air basin, and the meteorological conditions. The basin has low mixing heights and light winds, which are conducive to the accumulation of air pollutants. Pollutants that impact air quality are generally divided into two categories: criteria pollutants (those for which health standards have been set) and TACs (those that cause cancer or have adverse human health effects).

Criteria Pollutants

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to national and state standards. It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are met and maintained in the basin. Health-based air quality standards established by California and the federal government apply to ozone, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead. These standards were established to protect exposed sensitive receptors from adverse health effect with a margin of safety. The California standards are more stringent than the federal standards, and in the case of PM₁₀ and SO₂, the California standards are much more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of the air pollutants and their effects on health are summarized in **Table 5.2-7, Ambient Air Quality Standards**.

Air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for O₃, CO, SO₂, NO₂, PM₁₀, PM_{2.5}, and visibility reducing particles are not exceeded and all other standards are not equaled or exceeded at any time in any consecutive three-year period. The NAAQS (other than O₃, PM₁₀, PM_{2.5}, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O₃, PM₁₀, and PM_{2.5} are based on statistical calculations over one to three year periods, depending on the pollutant.

⁷⁵ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

**Table 5.2-7
Ambient Air Quality Standards**

Air Pollutant	Concentration/Averaging Time		Most Relevant Health Effects
	State Standard	Federal Primary Standard	
Ozone	0.070 ppm, 8-hr. avg. 0.09 ppm, 1-hr. avg.	0.075 ppm, 8-hr avg. (3-year average of annual 4 th -highest daily maximum)	(1) Short-term exposures: (a) Pulmonary function decrements and localized lung edema in humans and animals; and (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (2) Long-term exposures: (a) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (b) Vegetation damage; and (c) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. 20 ppm, 1-hr avg.	9 ppm, 8-hr avg. 35 ppm, 1-hr avg.	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.18 ppm, 1-hr avg. 0.030 ppm, annual arithmetic mean	0.053 ppm, annual arithmetic mean	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg. 0.25 ppm, 1-hr. avg.	0.030 ppm, annual arithmetic mean 0.14 ppm, 24-hr avg.	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in person with asthma
Suspended Particulate Matter (PM ₁₀)	20 µg/m ³ , annual arithmetic mean 50 µg/m ³ , 24-hr avg.	150 µg/m ³ , 24-hr avg.	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and (b) Excess seasonal declines in pulmonary function, especially in children

Air Pollutant	Concentration/Averaging Time		
	State Standard	Federal Primary Standard	Most Relevant Health Effects
Fine Particulate Matter (PM _{2.5})	12 µg/m ³ , annual arithmetic mean	15 µg/m ³ , annual arithmetic mean (3-year average) 35 µg/m ³ , 24-hr avg. (3-year average of 98 th percentile)	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and (c) Decrease lung functions and premature death
Sulfates	25 µg/m ³ , 24-hr avg.	None	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage
Lead*	1.5 µg/m ³ , 30-day avg.	1.5 µg/m ³ , calendar quarterly average	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to produce extinction of 0.23 per kilometer due to particles when relative humidity is less than 70%, 8-hour average (10 AM–6 PM)	None	Visibility impairment on days when relative humidity is less than 70 percent
Hydrogen Sulfide	0.03 ppm, 1-hr avg.	None	Odor annoyance
Vinyl Chloride*	0.01 ppm, 24-hr avg.	None	Known carcinogen

Source:

¹ California Air Resources Board. "Air Quality Standards." [Online] [February 22, 2007]. <<http://www.arb.ca.gov/research/aaqs/aaqs.htm>>.

² South Coast Air Quality Management District. Final Program Environmental Impact Report to the 2003 Draft AQMP (Diamond Bar, California: South Coast Air Quality Management District, August 2003), Table 3.1-1, p. 3.1-2. This report may be reviewed on the SCAQMD website at http://www.aqmd.gov/ceqa/documents/2003/aqmd/finalEA/aqmp/AQMP_FEIR.html.

µg/m³ = microgram per cubic meter.

ppm = parts per million by volume.

* CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

In 2006, the basin exceeded the federal standards for 8-hour ozone, PM₁₀, and PM_{2.5} on a total of 86, 0, and 32 days respectively.⁷⁶ Despite the substantial improvement over historical air quality in the past few

⁷⁶ Statistics for PM_{2.5} are based on the 35 µg/m³ standard.

decades, some areas in the basin still exceed the 8-hour federal standard for ozone more frequently than most other areas of the US.

Current Air Quality Summary

The following information is derived primarily from the SCAQMD's 2006 Air Quality Data Tables and presents a regional overview of the basin's air quality status. The project is located in Source Receptor Area 13 (SRA 13), Santa Clarita Valley, in northwest Los Angeles County. Ambient Air Monitoring Station No. 090 monitors pollutant concentrations for SRA 13.⁷⁷ As will be demonstrated later on in this EIR section, the Santa Clarita Valley area did not register any of the maximum pollutant concentrations measured for the basin in 2006.

In 2006, the maximum ozone, PM₁₀, and PM_{2.5} concentrations exceeded federal standards by wide margins. The maximum 8-hour average ozone concentration recorded (0.142 ppm in Central San Bernardino Mountains [SRA 37]) was 189 percent of the federal standard. Maximum 24-hour average and annual average PM₁₀ concentrations (142 µg/m³ recorded in Central San Bernardino Valley 1 area [SRA 34] and 64 µg/m³ recorded in the Mira Loma area [SRA 23]) were below the federal 24-hour standard and 320 percent of the state annual average standard, respectively. Maximum 24-hour average and annual average PM_{2.5} concentrations (72.2 µg/m³ recorded in South San Gabriel Valley area [SRA 11] and 20.6 µg/m³ recorded in Mira Loma area (SRA 23)) were 206 and 137 percent, respectively, of the federal 24-hour and annual average standards.⁷⁸ CO concentrations did not exceed the federal or state standards in 2006. The highest 8-hour average CO concentration recorded (6.4 ppm in the South Central Los Angeles County area (SRA 12)) was 71 percent of the federal 8-hour CO standard.

Concentrations of other pollutants remained below the standards. The maximum annual average NO₂ concentration (0.0310 ppm recorded in the Northwest San Bernardino Valley area [SRA 32]) was 58 percent of the federal standard and 103 percent of the state standard. The maximum 24-hour average sulfur dioxide (SO₂) concentration (0.010 ppm recorded in South Coastal Los Angeles County area [SRA 4]) was 7 percent of the federal standard. The maximum sulfate concentration recorded (28.7 µg/m³ in West San Gabriel Valley area [SRA 8]) was 115 percent of the state sulfate standard. The maximum quarterly average lead concentration recorded at any SCAQMD air monitoring station was 1 percent of the federal standard.

⁷⁷ South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix III, Table A-3, Figure A-1.

⁷⁸ Monitored values are compared to the revised to 35 µg/m³, which became effective December 18, 2006.

The federal ozone standard was exceeded within the air basin on a maximum of 86 days. No exceedances of the federal 24-hour PM₁₀ standard were recorded, and the federal 24-hour PM_{2.5} standard was exceeded on a maximum of 32 days (with respect to the revised 35 µg/m³ 24-hour standard).⁷⁹

The following sections present summary information on health effects and how frequently, and by how much of a margin, different areas of the basin exceeded the federal and state ambient air quality standards in 2006.

Ozone Specific Information

O₃ is a highly reactive and unstable gas capable of damaging the respiratory tract. The pollutant forms in the atmosphere through complex reactions between chemicals directly emitted from vehicles, industrial plants, and many other sources. Key pollutants involved in ozone formation are hydrocarbon and nitrogen oxide gases.⁸⁰ Please see the discussion of O₃, above in **Smog and Its Causes**, for more information and **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

Regularly monitored ozone concentrations at 29 locations in the basin exceeded the health advisory level (0.15 ppm) 10 times in 2006; however, maximum concentrations were below the stage 1 episode level (0.20 ppm).⁸¹

Table 5.2-8, 2006 Maximum 8-Hour Ozone Concentrations by County, shows maximum 8-hour ozone concentrations by county. The maximum concentrations are compared to the state 8-hour ozone standard, which is currently the most stringent ozone standard.

The number of days exceeding the state standard varied widely by source receptor area. Areas along or nearby the coast did not exceed the state standard, due in large part to the prevailing sea breeze which transports polluted air inland before high ozone concentrations can be reached. The standard was exceeded most frequently in the inland valleys extending from East San Gabriel Valley through the Riverside-San Bernardino area, and in the adjacent mountains. The Central San Bernardino Mountains area recorded the greatest number of exceedances of the state standard (96 days) and federal standard (59

⁷⁹ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

⁸⁰ California Air Resources Board. "Ozone." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/ozone-1/ozone-1.htm>>.

⁸¹ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

days). The East San Bernardino Mountains area recorded the greatest number of exceedances of the health advisory level (5 days).

Table 5.2-8
2006 Maximum 8-Hour Ozone Concentrations by County

County	Maximum 8-Hr Avg. (ppm)	Percent of State Standard	Source Receptor Area
Los Angeles	0.128	183	East San Fernando Valley, East San Gabriel Valley 2, and Pomona/Walnut Valley
Orange	0.114	163	North Orange County
Riverside	0.122	174	Perris Valley
San Bernardino	0.142	203	Central San Bernardino Mountains

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aaq06card.pdf>

The state 8-hour ozone standard is 0.070 ppm.

The number of exceedances of the 8-hour federal ozone standard was also lowest at the coastal areas, increasing to a peak in the Riverside-San Bernardino Valley and adjacent mountain areas.⁸²

Carbon Monoxide Specific Information

CO is a colorless, odorless gas. It results from the incomplete combustion of carbon-containing fuels such as gasoline or wood, and is emitted by a wide variety of combustion sources.⁸³ Please see **Table 5.2-5** for a discussion of the most relevant health effects.

Air Quality

Carbon monoxide concentrations were measured at 25 locations in the basin in 2006. **Table 5.2-9, 2006 Maximum Carbon Monoxide Concentrations by County**, shows the 2006 maximum 8-hour average concentrations of carbon monoxide by county. The state 8-hour carbon monoxide concentrations are compared the state 8-hour standard, which is currently the most stringent CO standard.

⁸² South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

⁸³ California Air Resources Board. "Carbon Monoxide." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/co/co.htm>>.

**Table 5.2-9
2006 Maximum Carbon Monoxide Concentrations by County**

County	Maximum 8-Hr Avg. (ppm)	Percent of State Standard	Source Receptor Area
Los Angeles	6.4	71	South Central L.A. County
Orange	3.0	33	North Orange County, Central Orange County, and North Coastal Orange County
Riverside	2.7	30	Mira Loma
San Bernardino	2.3	26	Central San Bernardino Valley 2

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>

The state 8-hour carbon monoxide standard is 9.0 ppm.

Regarding the maximum 8-hour average CO concentrations in the basin in 2006, higher concentrations were limited to the areas of Los Angeles County where vehicular traffic is most dense, with the maximum concentration (6.4 ppm) recorded in the South Central Los Angeles County area.

Particulate Matter Specific Information

Suspended particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Inhalable PM consists of particles less than 10 microns in diameter, and is defined as suspended particulate matter or PM₁₀. Fine particles are less than 2.5 microns in diameter (PM_{2.5}) and can significantly contribute to regional haze and reduction of visibility in California.⁸⁴

Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality, PM₁₀

In 2006, the SCAQMD monitored PM₁₀ concentrations at 21 locations in the basin. Maximum 24-hour and annual average concentrations are shown in **Table 5.2-10, 2006 Maximum 24-hour Average PM₁₀ Concentrations by County**, and **Table 5.2-11, 2006 Maximum Annual Average PM₁₀ Concentrations by County**, respectively.

⁸⁴ California Air Resources Board. "Particulate Matter." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm>>.

**Table 5.2-10
2006 Maximum 24-Hour Average PM₁₀ Concentrations by County**

County	Maximum 24-Hr Avg. (µg/m ³)	Percent of State Standard	Source Receptor Area
Los Angeles	117	234	South Coastal Los Angeles County 2
Orange	104	208	Central Orange County
Riverside	125	250	Perris Valley
San Bernardino	142	284	Central San Bernardino Valley 1

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>

The state 24-hour PM₁₀ standard is 50 µg/m³.

**Table 5.2-11
2006 Maximum Annual Average PM₁₀ Concentrations by County**

County	Annual Average (µg/m ³)	Percent of State Standard	Source Receptor Area
Los Angeles	45.0	225	South Coastal Los Angeles County 2
Orange	33.4	167	Central Orange County
Riverside	64.0	320	Mira Loma
San Bernardino	53.5	268	Central San Bernardino Valley 1

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>

The state PM₁₀ annual average standard is 20 µg/m³.

The state annual PM₁₀ standard was exceeded at areas all monitoring stations that monitor for PM₁₀. The federal 24-hour PM₁₀ standard was not exceeded at any monitoring stations in the South Coast Air Basin during 2006. The much more stringent state 24-hour PM₁₀ standard was exceeded in most areas of the basin in 2006 except for the Southwest Coastal Los Angeles County area.⁸⁵ **Table 5.2-10** shows the maximum 24-hour PM₁₀ average concentrations recorded in each county within the basin and gives the percentage of the state standard, which is currently the most stringent standard.

⁸⁵ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

Table 5.2-11 shows the maximum annual average PM₁₀ concentration recorded in each county within the basin and gives the percentage of the state standard, which is the most stringent standard. The federal PM₁₀ annual average standard was revoked in September 2006.

Air Quality, PM_{2.5}

The SCAQMD began regular monitoring of PM_{2.5} in 1999 following the US EPA's adoption of the national PM_{2.5} standards in 1997. In 2006, PM_{2.5} concentrations were monitored at 20 locations throughout the SCAQMD. Maximum 24-hour and annual average concentrations are shown in **Table 5.2-12, 2006 Maximum 24-hour Average PM_{2.5} Concentrations by County**, and **Table 5.2-13, 2006 Maximum Annual Average PM_{2.5} Concentrations by County**, respectively. The annual average PM_{2.5} standard was exceeded at 11 locations in the basin; however the federal 24-hour standard was exceeded at all locations in the basin.⁸⁶ **Table 5.2-12** shows the maximum 24-hour PM_{2.5} concentration recorded in each county within the basin and gives the percentage of the federal standard. It should be noted that the federal 24-hour PM_{2.5} standard has been revised to 35 µg/m³. The 2006 statistics are based on the revised standard, which was the most stringent standard at the time of the monitoring.

Table 5.2-12
2006 Maximum 24-Hour Average PM_{2.5} Concentrations by County

County	Maximum 24-Hr Avg. (µg/m ³)	Percent of Federal Standard	Source Receptor Area
Los Angeles	72.2	206	South San Gabriel Valley
Orange	56.2	161	Central Orange County
Riverside	68.5	196	Metropolitan Riverside County 1
San Bernardino	55.0	157	Central San Bernardino Valley 2

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/eq06card.pdf>

Percent of federal standard numbers are based on the revised 35 µg/m³ standard.

Table 5.2-13 shows the maximum annual average PM_{2.5} concentrations recorded in each county within the basin for 2006. As well, the percentage of the state annual average standard is shown, which is the most stringent standard.

⁸⁶ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

**Table 5.2-13
2006 Maximum Annual Average PM_{2.5} Concentrations by County**

County	Annual Average ($\mu\text{g}/\text{m}^3$)	Percent of State Standard	Source Receptor Area
Los Angeles	16.7	139	South San Gabriel Valley and South Central Los Angeles County
Orange	14.1	118	Central Orange County
Riverside	20.6	172	Mira Loma
San Bernardino	18.5	154	Southwest San Bernardino Valley

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>.

The state PM_{2.5} annual average standard is 12 $\mu\text{g}/\text{m}^3$.

PM_{2.5} concentrations were higher in the inland valley areas of San Bernardino and Metropolitan Riverside Counties, but were also high in Los Angeles County and central Orange County. The high PM_{2.5} concentrations in Los Angeles and Orange Counties were due to the secondary formation of smaller particulates generated by mobile and stationary source activities.

Nitrogen Dioxide Specific Information

Nitrogen dioxide (NO₂) is a reactive oxidizing gas capable of damaging cells lining the respiratory tract. This pollutant is also an essential ingredient in the formation of ground-level O₃ pollution. NO₂ is one of the nitrogen oxides emitted from high-temperature combustion processes, such as those occurring in trucks, cars and power plants (NO_x is emitted from such sources primarily as nitric oxide [NO]). Home heaters and gas stoves also produce substantial amounts of NO₂ in indoor settings.⁸⁷

Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

In 2006, NO₂ concentrations were monitored at 24 locations in the basin. No area of the basin exceeded the federal or state standards for NO₂.⁸⁸ Maximum annual average concentrations for 2006 are shown in **Table 5.2-14, 2006 Maximum 1-Hour Nitrogen Dioxide Concentrations by County**. The basin has not

⁸⁷ California Air Resources Board. "Nitrogen Dioxide." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/no2-1/no2-1.htm>>.

⁸⁸ Based on the previous 0.25 ppm 1-hour state standard and 0.053 ppm federal annual arithmetic mean standard, which were the effective standards during the time of the monitoring. The revised and new NO₂ standards became effective March 20, 2008.

exceeded the federal standard for NO₂ since 1991, when the Los Angeles County portion of the basin recorded the last exceedance of the standard in any US county.

Table 5.2-14
2006 Maximum 1-Hour Nitrogen Dioxide Concentrations by County

County	Maximum 1-Hr Avg. (ppm)	Percent of State Standard	Source Receptor Area
Los Angeles	0.14	56	South Central Los Angeles County
Orange	0.11	44	Central Orange County
Riverside	0.11	44	Banning Airport
San Bernardino	0.10	40	Northwest San Bernardino Valley

Source: South Coast Air Quality Management District, 2005 Air Quality Data Tables. December 10, 2006. <http://www.aqmd.gov/smog/AQSCR2005/aaq05card.pdf>.

Statistics are based on the previous state 1-hour nitrogen dioxide standard (i.e., 0.25 ppm).

The state 1-hour standard was not exceeded at any South Coast Air Basin monitoring location in 2006. The highest 1-hour average concentration recorded (0.14 ppm in South Central Los Angeles County) was 56 percent of the state standard.⁸⁹

Sulfur Dioxide Specific Information

A gaseous compound of sulfur and oxygen, SO₂ is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO₂ is also emitted during some industrial processes, such as petroleum refining and metal processing.⁹⁰ Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

Monitored SO₂ concentrations in the basin remained below the federal and state standards in 2006. Although SO₂ concentrations remained well below the standards, SO₂ is a precursor to sulfate, which is a component of PM₁₀ and PM_{2.5}. Standards for both PM₁₀ and PM_{2.5} were both exceeded in 2006.⁹¹

⁸⁹ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>. Based on the previous 0.25 ppm 1-hour state standard.

⁹⁰ California Air Resources Board. "Sulfur Dioxide." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/so2-1/so2-1.htm>>.

⁹¹ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

Maximum concentrations of SO₂ for 2006 are shown in **Table 5.2-15, 2006 Maximum 24-Hour Sulfur Dioxide Concentrations by County.**

Table 5.2-15
2006 Maximum 24-Hour Sulfur Dioxide Concentrations by County

County	Maximum 24-hr Avg. (ppm)	Percent of State Standard	Source Receptor Area
Los Angeles	0.010	25	South Coastal Los Angeles County
Orange	0.004	10	North Coastal Orange County
Riverside	0.004	10	Metropolitan Riverside County 1
San Bernardino	0.003	8	Central San Bernardino Valley 1

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>.

The state 24-hour sulfur dioxide standard is 0.04 ppm.

Sulfates Specific Information

Sulfates (SO₄) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO₂) during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO₂ to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.⁹²

Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

Sulfate was monitored at 14 locations in the basin in 2006. The state SO₄ standard was exceeded in two locations (West San Gabriel Valley and South San Gabriel Valley) in the basin in 2006 as shown in **Table 5.2-16, 2006 Maximum 24-Hour Sulfate Concentrations by County.**

⁹² California Air Resources Board. "Sulfates." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/sulf-1/sulf-1.htm>>.

Table 5.2-16
2006 Maximum 24-Hour Sulfate Concentrations by County

County	Maximum 24-hr Avg. ($\mu\text{g}/\text{m}^3$)	Percent of State Standard	Source Receptor Area
Los Angeles	28.7	115	West San Gabriel Valley
Orange	N.D.	—	—
Riverside	10.8	43	Metropolitan Riverside County 1
San Bernardino	11.0	44	Central San Bernardino Valley 2

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>.

N.D. = No Data. Historical measurements indicate concentrations are well below standards and monitoring has been discontinued.

The state 24-hour sulfate standard is 25 $\mu\text{g}/\text{m}^3$.

Lead Specific Information

Lead is a relatively soft and chemically resistant metal, and forms compounds with both organic and inorganic substances. As an air pollutant, lead is present in small particles. Sources of lead emissions in California include a variety of industrial activities. Because it was emitted in large amounts from vehicles when leaded gasoline was used, lead is present in many soils (especially urban soils) and can get re-suspended into the air.⁹³ Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

The federal and state standards for lead were not exceeded in any area of the basin in 2006. As a result of removal of lead from gasoline, there have been no violations of the standards at the air monitoring stations in the basin since 1982. However, special monitoring stations immediately adjacent to stationary sources of lead (such as lead smelters and plating operations) have recorded exceedances of the standards in very localized areas of the basin as recently as 1991 for the federal standard and 1994 for the state standard. **Table 5.2-17, 2006 Maximum Monthly Lead Concentrations by County**, shows the maximum concentrations recorded in 2006. The highest quarterly average lead concentration (0.24 $\mu\text{g}/\text{m}^3$ in Central Los Angeles), measured at special monitoring sites immediately adjacent to stationary sources of lead, was 15 percent of the federal standard.

⁹³ California Air Resources Board. "Lead." [Online] 8 January 2004. <<http://www.arb.ca.gov/research/aaqs/caaqs/pb-1/pb-1.htm>>.

Table 5.2-17
2006 Maximum Monthly Lead Concentrations by County

County	Maximum Monthly Average ($\mu\text{g}/\text{m}^3$)	Percent of State Standard	Source Receptor Area
Los Angeles	0.03	2	South San Gabriel Valley
Orange	N.D.	—	—
Riverside	0.01	0.7	Metropolitan Riverside County
San Bernardino	0.02	1.3	Central San Bernardino Valley

Source: South Coast Air Quality Management District, 2006 Air Quality Data Tables. <http://www.aqmd.gov/smog/AQSCR2006/aq06card.pdf>

N.D. = No Data. Historical measurements indicate concentrations are well below standards. The state 30-day lead standard is $1.5 \mu\text{g}/\text{m}^3$.

The maximum monthly average lead concentration at the regular monitoring stations ($0.03 \mu\text{g}/\text{m}^3$ in South San Gabriel Valley) was 2 percent of the state standard. The maximum at the special monitoring sites immediately adjacent to sources ($0.24 \mu\text{g}/\text{m}^3$ in Central Los Angeles) was 16 percent of the standard.⁹⁴

Hydrogen Sulfide (H₂S) Specific Information

Formed during bacterial decomposition of sulfur-containing organic substances, H₂S is a colorless gas with the odor of rotten eggs. It also can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.⁹⁵ Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

The SCAQMD's monitoring stations throughout the basin do not currently monitor this pollutant.⁹⁶

⁹⁴ South Coast Air Quality Management District. Historical Data by Year. SCAQMD. [Online] May 19, 2008. <<http://www.aqmd.gov/smog/historicaldata.htm>>.

⁹⁵ California Air Resources Board. "Hydrogen Sulfide." [Online] 22 December 2003. <<http://www.arb.ca.gov/research/aaqs/caaqs/h2s/h2s.htm>>.

⁹⁶ South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix II, Tables A-4 – A-22.

Vinyl Chloride Specific Information

Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.⁹⁷

Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

The SCAQMD's monitoring stations throughout the basin do not currently monitor this pollutant.⁹⁸

Visibility-Reducing Particles Specific Information

Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.⁹⁹

Please see **Table 5.2-7** for a discussion of the most relevant health effects.

Air Quality

Although the SCAQMD's monitoring stations throughout the basin do not directly monitor visibility-reducing particles, this pollutant is indirectly measured as PM₁₀ and PM_{2.5}.¹⁰⁰

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the State of California has adopted a standard for visibility or visual range. Until 1989, the standard was based on visibility estimates made by human observers, but the standard was changed that year to require measurement of visual range using

⁹⁷ California Air Resources Board. "Vinyl Chloride." [Online] 22 December 2003. <<http://www.arb.ca.gov/research/aaqs/caaqs/vc/vc.htm>>.

⁹⁸ South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix II, Tables A-4 – A-22.

⁹⁹ California Air Resources Board. "Visibility Reducing Particles." [Online] 22 December 2003. <<http://www.arb.ca.gov/research/aaqs/caaqs/vrp-1/vrp-1.htm>>.

¹⁰⁰ South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix II, Tables A-4 – A-22.

instruments that measure light scattering and absorption by suspended particles. However, as noted above, the SCAQMD does not directly monitor visibility-reducing particles.¹⁰¹

Criteria Pollutant Emissions Inventory

SCAQMD's emissions inventory for the basin in 2006 is summarized in **Table 5.2-18, Annual Average Emissions by Major Source Type for Baseline Year 2006**. The emissions inventory for the anthropogenic (of human genesis) inventory is made up of stationary sources and mobile sources.

**Table 5.2-18
Annual Average Emissions by Major Source Type for Baseline Year 2006**

Source Category	(tons/day)					
	VOC	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Total Stationary and Area Sources	250.2	165.7	83.	20.	231.2	64.
Total On-Road Vehicles	261.1	2,613.6	549.5	4.	27.	20.
Total Other Mobile	164.7	966.4	317.0	23.	20.	18.
Total	676.0	3,745.7	950.4	48.	279.7	103.9

Source: Air Resources Board, 2006 Estimated Annual Average Emissions South Coast Air Basin. Sacramento, California: Air Resources Board. http://www.arb.ca.gov/app/emsmv/emseic1_query.php.

Stationary sources are grouped under the following categories: fuel combustion; waste disposal; cleaning and surface coatings; petroleum production and marketing; industrial processes; solvent evaporation and other miscellaneous processes. Mobile sources are divided into two source categories: on-road and other mobile sources. On-road mobile sources include light-duty passenger vehicles; light-, medium-, and heavy-duty trucks; motorcycles; urban buses; school buses; and motor homes. Other mobile sources include off-road recreational vehicles, off-road equipment, trains, ships, commercial boats, aircraft, and farm equipment.¹⁰²

The SCAQMD emissions inventory includes emissions in the basin of VOC, CO, NO_x, SO_x, PM₁₀, and PM_{2.5}. Since ozone is formed by photochemical reactions involving the precursors VOC and NO_x, it is not inventoried. **Table 5.2-16** lists the 2006 (most recent) inventory for the criteria pollutants (including PM_{2.5}) in the basin.

¹⁰¹ California Air Resources Board. "Visibility Reducing Particles." [Online] 22 December 2003. <<http://www.arb.ca.gov/research/aaqs/caaqs/vrp-1/vrp-1.htm>>.

¹⁰² South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix III, p. III-2-1.

As shown in **Table 5.2-18**, mobile sources are the major contributors to CO (96 percent), NO_x (91 percent), SO_x (58 percent), and VOC (63 percent) emissions in the basin. Stationary and area sources are the major contributors to PM₁₀ and PM_{2.5} emissions (83 and 63 percent, respectively).

Lead and vinyl chloride inventories for the basin are shown in **Table 5.2-19, 1998 Annual Average Day Toxic Emissions for the South Coast Air Basin**, below. Hydrogen sulfide, as discussed above, is primarily related to odors and would be inventoried as a nuisance. Visibility-reducing particles are indirectly discussed above in the context of PM₁₀ and PM_{2.5}. Sulfate is indirectly discussed above in the context of SO_x.

Table 5.2-19
1998 Annual Average Day Toxic Emissions for the South Coast Air Basin (lbs/day)

TAC	On-Road	Off-Road	Point	AB2588	Area	Total
Acetaldehyde ^a	5,485.8	5,770.3	33.9	57.1	189.1	11,536.2
Acetone ^b	4,945.8	4,824.7	3,543.5	531.4	23,447.4	37,292.8
Benzene	21,945.5	6,533.4	217.7	266.8	2,495.4	31,458.8
Butadiene [1,3]	4,033.8	1,566.1	6.7	2.0	151.3	5,759.9
Carbon tetrachloride	0.	0.0	8.8	1.8	0.0	10.6
Chloroform	0.	0.0	0.0	35.5	0.0	35.5
Dichloroethane [1,1]	0.	0.0	0.0	0.0	0.0	0.0
Dioxane [1,4]	0.	0.0	0.0	105.0	0.0	105.0
Ethylene dibromide	0.	0.0	0.0	0.0	0.0	0.0
Ethylene dichloride	0.	0.0	4.9	17.6	0.0	22.5
Ethylene oxide	0.	0.0	58.1	12.3	454.1	524.4
Formaldehyde ^a	16,664.9	16,499.3	521.6	674.7	1,107.5	35,468.0
Methyl ethyl ketone ^a	905.1	906.9	3,240.2	385.9	14,535.4	19,973.5
Methylene chloride	0.	0.0	1,378.6	1,673.6	94,21.7	12,473.9
Methyl tertiary butyl ether (MTBE)	58,428.9	2,679.2	40.5	434.4	54,73.7	67,056.7
p-Dichlorobenzene	0.	0.0	0.0	4.8	3,735.6	3,740.1
Perchloroethylene	0.	0.0	4,622.0	2,249.1	22,813.1	29,684.2
Propylene oxide	0.	0.0	0.0	22.3	0.0	22.3
Styrene	1,114.8	287.1	447.0	3,836.7	21.4	5,707.0
Toluene	63,187.6	11,085.9	5,689.6	3,682.4	52,246.7	135,892.2
Trichloroethylene	0.	0.0	1.0	58.0	2,550.3	2,609.3
Vinyl chloride	0.	0.0	0.0	4.0	0.0	4.0
Arsenic	0.	0.0	2.0	0.0	21.4	25.2
Cadmium	1.	1.0	0.0	0.0	27.5	31.8
Chromium	2.	2.0	3.0	2.0	302.2	313.0

TAC	On-Road	Off-Road	Point	AB2588	Area	Total
Diesel particulate	23,906.3	22,386.3	0.0	5.4	815.3	47,113.4
Elemental carbon ^c	27,572.1	6,690.3	702.8	0.0	16,770.5	51,735.7
Hexavalent chromium	0.0	0.4	0.0	1.0	0.0	2.0
Lead	0.0	0.9	1.9	24.5	1,016.3	1,044.3
Nickel	2.0	2.0	2.9	21.6	85.6	114.9
Organic carbon ^c	16,426.2	153,81.8	0.0	0.0	108,612.1	140,420.2
Selenium	0.0	0.0	3.0	5.0	2.0	11.6
Silicon ^b	68.6	67.6	167.2	0.0	248,614.0	248,917.4

Source: South Coast Air Quality Management District, "Multiple Air Toxics Exposure Study II," (2000), Table 5.2.

^a = Primarily emitted emissions. These materials are also formed in the atmosphere as a result of photochemical reactions.

^b = Acetone and silicon silica are not toxic compounds. Their emissions are included in this table because they were measured in the sampling program and were subsequently modeled for the purpose of model evaluation.

^c = Includes elemental carbon from all sources (including diesel particulate).

Toxic Air Contaminants

The following information has been obtained primarily from the SCAQMD's Multiple Air Toxics Exposure Study II (MATES II), described below. TACs typically emitted in the basin include the contaminants listed in **Table 5.2-19**.

Cancer Risk

One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. In other words, any exposure to a carcinogen poses some risk of causing cancer. Health statistics show that one in three people will contract cancer over their lifetime, or about 333,000 in 1 million, from all causes, including diet, genetic factors, and lifestyle choices. Approximately 2 percent of cancer deaths in the United States may be due to TACs.¹⁰³

The MATES II, which is the most comprehensive study of urban toxic air pollution ever undertaken, shows that motor vehicles and other mobile sources of air pollution are the predominant source of cancer-causing air pollutants in the basin.¹⁰⁴ The SCAQMD's Governing Board directed staff to

¹⁰³ Doll and Peto. "The Causes of Cancer: Qualitative Estimates of Avoidance of Risks of Cancer in the United States Today," *Journal of the National Cancer Institute* (June 1981).

¹⁰⁴ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study II (MATES II) (Diamond Bar, California: South Coast Air Quality Management District, March 2000), p. ES-3. <<http://www.aqmd.gov/matesiidf/matestoc.htm>>.

undertake the MATES II as part of the agency's environmental justice initiatives adopted in late 1997. A panel of scientists from universities, an environmental group, businesses, and other government agencies helped design and guide the study. One goal of the study was to determine the cancer risk from toxic air pollution throughout the area by monitoring toxics continually for one year at 10 monitoring sites. Another goal was to determine if there were any sites where TAC concentrations emitted by local industrial facilities were causing a disproportionate cancer burden on surrounding communities. To address this second goal, the SCAQMD monitored toxic pollutants at 14 sites for one month each with three mobile monitors. Monitoring platforms were placed in or near residential areas adjacent to clusters of facilities.¹⁰⁵ Although no TAC hotspots were identified, models show that elevated levels of toxic air pollutants can occur very close to facilities emitting TACs.¹⁰⁶

In the MATES II study, SCAQMD monitored more than 30 TACs at 24 sites over a one-year period in 1999. The SCAQMD collected more than 4,500 air samples and, together with the CARB, performed more than 45,000 separate laboratory analyses of these samples. In the study, SCAQMD calculated cancer risk assuming 70 years of continuous exposure to monitored levels of pollutants.¹⁰⁷

The MATES II found that the average carcinogenic risk throughout the basin is approximately 1,400 in 1 million ($1,400 \times 10^{-6}$). Diesel-fueled mobile sources represent the greatest contributors to TAC emissions in the basin.¹⁰⁸

A MATES III study has been conducted, and the draft report was released in January 2008 for public comment.¹⁰⁹ The SCAQMD has not released a final report. The draft report indicates, "The carcinogenic risk from air toxics in the Basin based on the average concentrations at the fixed monitoring sites is about

¹⁰⁵ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study II (MATES II) (Diamond Bar, California: South Coast Air Quality Management District, March 2000), p. ES-1. <<http://www.aqmd.gov/matesiidf/matestoc.htm>>.

¹⁰⁶ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study II (MATES II) (Diamond Bar, California: South Coast Air Quality Management District, March 2000), p. ES-6. <<http://www.aqmd.gov/matesiidf/matestoc.htm>>.

¹⁰⁷ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study II (MATES II) (Diamond Bar, California: South Coast Air Quality Management District, March 2000), pp. ES-1–ES-2. <<http://www.aqmd.gov/matesiidf/matestoc.htm>>.

¹⁰⁸ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study II (MATES II) (Diamond Bar, California: South Coast Air Quality Management District, March 2000), p. ES-3, Fig. ES-2, p. ES-9. <<http://www.aqmd.gov/matesiidf/matestoc.htm>>.

¹⁰⁹ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III) (Diamond Bar, California: South Coast Air Quality Management District, January 2008). <<http://www.aqmd.gov/prdas/matesIII/matesIII.html>>.

1,200 per million.¹¹⁰ However, the MATES III cancer risk is not directly comparable with that found in MATES II.¹¹¹

Noncancer Health Risks

For exposures to compounds that do pose a health risk, but not a cancer risk, it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) developed reference exposure levels (REL) for noncarcinogenic TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. Comparing the estimated level of exposure to the REL assesses the noncancer health risk due to exposure to a TAC. The comparison is expressed as the ratio of the estimated exposure level to the REL, referred to as the hazard index.¹¹²

Toxic Air Contaminants Inventory

The data available for TAC emissions inventories are not nearly as complete as the data for criteria pollutants. Starting in 1989, industrial and other facilities have been required to compile toxic emissions inventories under the AB 2588 program. Companies subject to the program are required to report their TAC emissions to the SCAQMD.¹¹³

The SCAQMD's first emissions inventory was compiled for 30 TACs for the year 1982 for stationary sources only. This inventory was updated during the preparation of the 1999 MATES II study, which consisted of an evaluation and a characterization of ambient air toxics data in the basin. The MATES II inventory is the most up-to-date inventory prepared by the SCAQMD. It also estimated the cancer risk of several TACs. For the study, 20 of the original 30 pollutants were updated for the year 1998. Additionally,

¹¹⁰ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III) (Diamond Bar, California: South Coast Air Quality Management District, January 2008). p. ES-2. <<http://www.aqmd.gov/prdas/matesIII/matesIII.html>>.

¹¹¹ South Coast Air Quality Management District, Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III) (Diamond Bar, California: South Coast Air Quality Management District, January 2008). p. ES-3. <<http://www.aqmd.gov/prdas/matesIII/matesIII.html>>.

¹¹² Air Toxic Hot Spots Program Risk Assessment Guidelines, Part III, Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels, OEHHA (February 2000), p. 9.

¹¹³ In September 1987, the California Legislature established the AB 2588 Air Toxics "Hot Spots" program. (Health and Safety Code Section 44300, *et seq.*). It requires facilities to report their air toxics emissions, ascertain health risks, and to notify nearby residents of significant risks. The emissions inventory and risk assessment information from this program has been incorporated into this report. In September 1992, the "Hot Spots" Act was amended by Senate Bill 1731 to require facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

mobile source emissions for 12 of the 20 toxic pollutants were compiled. The stationary source data included 1,244 point sources and the mobile source inventory included only on-road motor vehicles. A summary of the 1998 emissions inventory is presented in **Table 5.2-19**, which provides the estimated toxic emissions for selected compounds, by source category.

Local Climate

The coastal area of the basin is dominated by a semi-permanent, subtropical, Pacific high-pressure system. Generally mild, the climate is tempered by cool sea breezes, but may be infrequently interrupted by periods of extremely hot weather, passing winter storms, or Santa Ana winds. The project site is located further inland where the temperature is generally higher and the relative humidity lower than along the coast.

The project site is located in the transitional microclimatic zone of the basin, which is located between two climatic types, termed valley marginal and high desert. Situated far enough from the ocean to usually escape coastal damp air and fog, the summers are hot and the winters are sunny and warm. Summer nights are cool and the surrounding slopes drain off cold air near the ground on clear winter nights.

The South Coast Air Basin both transports and receives air pollutants from the coastal portions of Ventura and Santa Barbara counties that are located in the South Central Coast Air Basin, which also receives air pollutants from oil and gas development operations on the outer continental shelf.

Climate in the Santa Clarita Valley is relatively mild and annual average daytime temperatures range from 89.7 °F in summer to 63.6 °F in winter. Low temperatures average 58.9 °F in summer and 41.3 °F in winter. In wintertime during calm, clear nights, the localized mountain/valley wind patterns are enhanced and cool air blows down from the mountains towards the Valley floor. Annual precipitation in the Santa Clarita Valley is approximately 13 inches, which occurs almost exclusively from late October to early April. As elsewhere in the basin, precipitation is higher in the mountains than in the Valley. Portions of the Santa Susana and San Gabriel Mountains, which form the outer limits of the Valley, receive between 22 and 24 inches of rainfall per year.

Predominant wind patterns for the greater Santa Clarita Valley area are typical for areas in which valleys and mountains are located in proximity to one another. During the day, onshore winds reach the Valley and are enhanced by local topographical features. During the night, surface radiation cools the air in the mountains and hills, which flows down the Valley, producing a gentle wind pattern (**Figure 5.2-2, Dominant Wind Patterns in the Basin**). The predominant daytime wind flows from the south/southeast as the effects of the regional onshore flow are modified by the up-valley flow from the San Fernando Valley through the Newhall Pass. This pattern is most dominant during summer, the peak smog season. At night, local winds flow down the Santa Clara River Valley as winds flowing from the east.

Local Ambient Air Quality

Source Receptor Area 13

To monitor the concentrations of the criteria pollutants, the SCAQMD has divided the air district (South Coast and Riverside County portion of the Salton Sea Air Basins) into source receptor areas (SRAs) in which its 34 air quality monitoring stations are operated. The project site is located within SRA 13, which encompasses the Santa Clarita Valley west to the Ventura County line. The station that monitors this SRA (No. 090) is located approximately 5 miles southeast of the project site at 12th Street and Placerita Canyon Road.¹¹⁴ The Santa Clarita station presently only monitors pollutant concentrations of ozone, CO, NO₂, and PM₁₀. The monitoring station also monitored for SO₂ up to 1991 when the pollutant was no longer a problem in the region.¹¹⁵ No other SCAQMD monitoring stations operate in the Santa Clarita Valley.

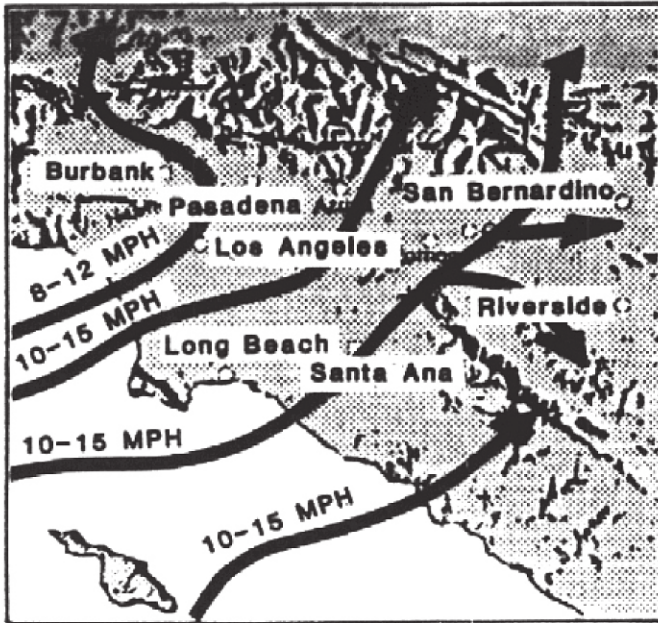
Table 5.2-20, Ambient Pollutant Concentrations Registered in SRA 13, lists the ambient pollutant concentrations registered and the exceedances of state and federal standards that have occurred at the Santa Clarita monitoring station from 2002 through 2006 (most recent data available at the time of this writing).

As shown, the Santa Clarita monitoring station has recently registered values above the state and federal standards for ozone and the state standard for PM₁₀. Concentrations of CO and NO₂ have not been exceeded within the Santa Clarita Valley and concentrations of the other two criteria pollutants, sulfur dioxide and lead, have not been exceeded anywhere within the basin since 1990 and 1982, respectively.¹¹⁶

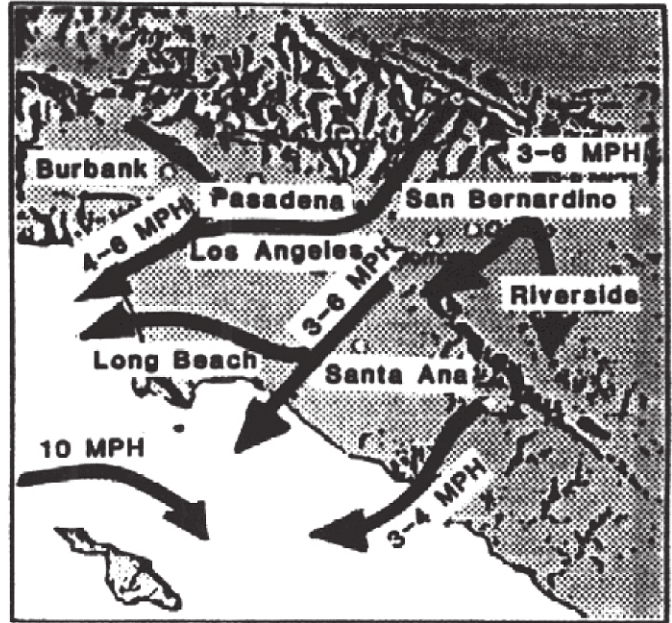
¹¹⁴ South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003 <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix III, Attachment A, Table A-3 and Figure A-1.

¹¹⁵ South Coast Air Quality Management District. 2003 AQMP. [Online] December 22, 2003. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix III, Tables A-4 – A-22.

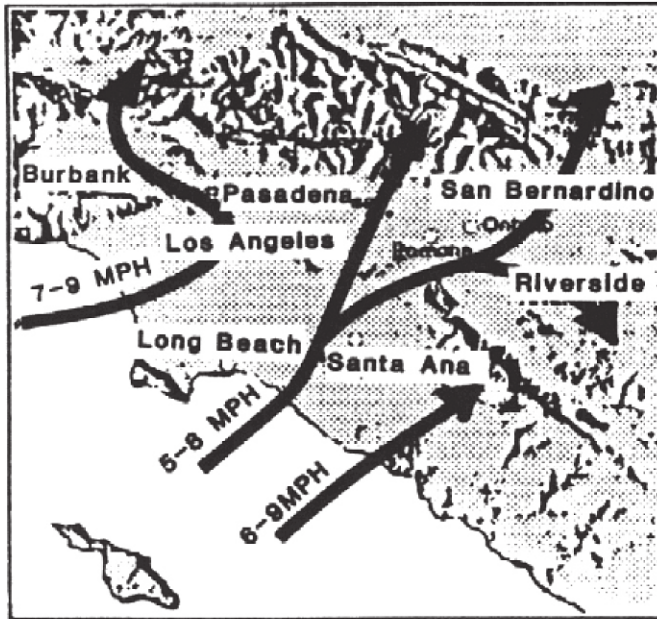
¹¹⁶ South Coast Air Quality Management District. "2003 AQMP." [Online] March 31, 2004. <<http://www.aqmd.gov/aqmp/AQMD03AQMP.htm>>, Appendix II, Attachment A, Tables A-17, A-18, A-21 and A-22.



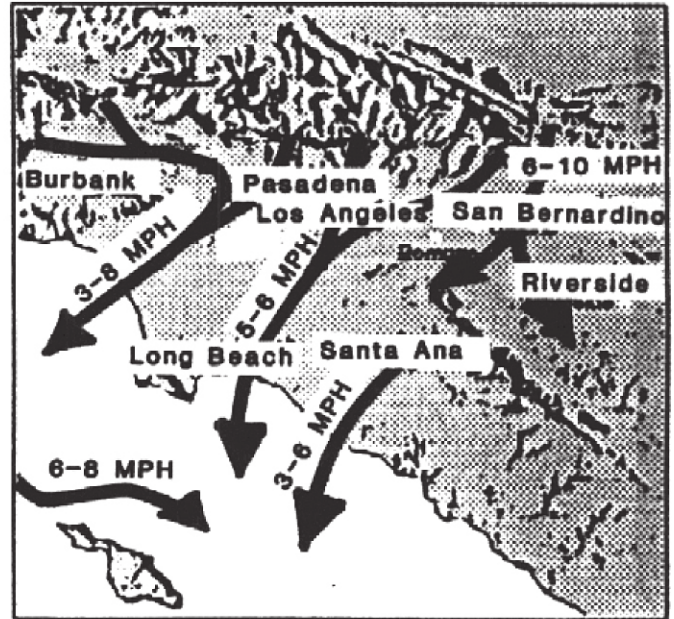
Typical Summer Daytime Ocean Winds
(noon to 7:00 pm)



Typical Summer Night Drainage Winds
(midnight to 5:00 am)



Typical Winter Daytime Ocean Winds
(noon to 7:00 pm)



Typical Winter Night Drainage Winds
(midnight to 5:00 am)



NOT TO SCALE

SOURCE: South Coast Air Quality Management District, CEQA Air Quality Handbook

FIGURE 5.2-2

Dominant Wind Patterns in the Basin

**Table 5.2-20
Ambient Pollutant Concentrations Registered in SRA 13**

Pollutant	Standards ^{1,2}	Year				
		2002	2003	2004	2005	2006
SANTA CLARITA MONITORING STATION						
OZONE (O₃)						
Maximum 8-hour concentration monitored (ppm)		0.145	0.152	0.133	0.141	0.120
Number of days exceeding federal standard ³	0.075 ppm	56	69	52	47	40
Number of days exceeding Health Advisory	0.15 ppm	8	15	1	5	1
CARBON MONOXIDE (CO)						
Maximum 1-hour concentration monitored (ppm)		3	3	5	2	2
Maximum 8-hour concentration monitored (ppm)		1.9	1.7	3.7	1.3	1.3
Number of days exceeding federal 8-hour standard	9.5 ppm	0	0	0	0	0
Number of days exceeding state 8-hour standard	9.0 ppm	0	0	0	0	0
NITROGEN DIOXIDE (NO₂)						
Maximum 1-hour concentration monitored (ppm)		0.10	0.12	0.09	0.087	0.08
Number of days exceeding state standard ⁴	0.18 ppm	0	0	0	0	0
PARTICULATE MATTER (PM₁₀)						
Maximum 24-hour concentration (µg/m ³)		61	72	54	55	53
Number of samples		60	61	60	60	58
Number of samples exceeding federal standard	150 µg/m ³	0	0	0	0	0
Number of samples exceeding state standard	50 µg/m ³	7	10	2	1	1
PARTICULATE MATTER (PM_{2.5})⁵						
Maximum 24-hour concentration (µg/m ³)		63.0	120.6	60.1	63.2	50.7
Annual arithmetic mean (µg/m ³)	15 µg/m ³	24.0	22.1	19.2	17.9	16.6
Number of samples exceeding federal standard ⁶	35 µg/m ³	0	1	0	0	0
SULFUR DIOXIDE (SO₂)⁵						
Maximum 1-hour concentration (ppm)		0.013	0.013	0.024	0.013	0.01
Maximum 24-hour concentration (ppm)		0.007	0.005	0.010	0.006	0.004
Annual arithmetic mean concentration (ppm)		0.001	0.002	0.003	0.002	0.0006

Pollutant	Standards ^{1,2}	Year				
		2002	2003	2004	2005	2006
Number of days exceeding state 1-hour standard	0.25 ppm	0	0	0	0	0
Number of days exceeding state 24-hour standard	0.04 ppm	0	0	0	0	0
Number of days exceeding federal 24-hour standard	0.14 ppm	0	0	0	0	0

Sources: South Coast Air Quality Management District, *Air Quality Data (for 2002, 2003, 2004, 2005, and 2006)*, (Diamond Bar, California: South Coast Air Quality Management District, 2002, 2003, 2004, 2005, and 2006). www.aqmd.gov/smog/historicaldata.htm.

¹ Parts by volume per million of air (ppm), micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$), or annual arithmetic mean (aam).

² Federal and state standards are for the same time period as the maximum concentration measurement unless otherwise indicated.

³ The 8-hour standard was revised on March 27, 2008, and became effective on May 27, 2008. The statistics shown are based on the previous standard of 0.08 ppm.

⁴ The state NO_2 standard was revised from 0.25 ppm to 0.18 ppm in February 2008. The new standard became effective March 20, 2008; however, statistics shown are based on the 0.25 ppm standard.

⁵ This pollutant (i.e., $\text{PM}_{2.5}$ and SO_2) is not monitored in SRA 13. Values shown are from the monitoring station in SRA 7 (Burbank – West Palm Ave).

⁶ The federal $\text{PM}_{2.5}$ standard was revised from 65 to 35 $\mu\text{g}/\text{m}^3$ in September 2006. Statistics shown are based on the 65 $\mu\text{g}/\text{m}^3$ standard. The monitoring station at SRA 7 recorded six exceedances of the revised 35 $\mu\text{g}/\text{m}^3$ standard in 2006.

Local Vicinity Emissions

The project site is located in the community of Placerita Canyon in the City of Santa Clarita northeast of downtown Newhall. Equestrian-oriented residential areas, single family homes and small ranches typify most of the development in the surrounding area. Interstate 5 (I-5) lies approximately 2.5 miles to the west and California State Route 14 (SR-14) lies approximately 1.2 miles to the east. Oil fields are located in the eastern portion of the Canyon west of SR-14. The western portion of the canyon includes the College, the Golden Oak Ranch, Gene Autry's Melody Ranch, and the Placerita Canyon Nature Center. Emission sources include stationary activities, such as space heating, cooking, and water heating; and mobile activities—primarily automobile and truck traffic along surrounding roadways. No stationary sources of toxic air contaminants occur within 0.25 mile of the project site.¹¹⁷

Motor vehicles are the primary sources of pollutants within the project vicinity. In general, traffic-congested roadways and intersections that operate at a level of service (LOS) D, E, or F have the potential to generate localized high levels of CO within approximately 1,000 feet of a roadway. Localized areas where ambient concentrations exceed state and/or federal standards are termed CO "hotspots." Section 9.4 of the *CEQA Air Quality Handbook* identifies CO as a localized problem requiring additional

¹¹⁷ According to the *CEQA Air Quality Handbook*, 1/4-mile is the distance which the SCAQMD uses in evaluating impacts on sensitive receptors, which include long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities. South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, April 1993), p. 5-1, Fig. 5-1; p. 5-7.

analysis when a project is likely to subject sensitive receptors to CO hotspots.¹¹⁸ Sensitive receptors are populations that are more susceptible to the effects of air pollution than the population at large. The SCAQMD identifies the following as sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities.¹¹⁹ As indicated in **Table 5.2-20** above, CO concentrations have not been an issue in SRA 13 and are not expected to be an issue in the project study area,¹²⁰ because the existing background concentrations for SRA 13 are well below the CO standards. Nevertheless, all intersections significantly impacted by the proposed project's traffic contribution were analyzed for the potential presence of CO hotspots.

Site Specific Emissions

The project site consists of existing academic and student housing buildings, undeveloped land, two water tanks, and the improved Creekview Park. Site specific emissions include combustion exhaust emissions from on-site vehicles traveling on campus roads and parking lots, point source emissions from buildings such as boilers and emergency generators, and from portable equipment such as landscaping equipment.

PROJECT IMPACTS

The analysis of potential local and regional air quality impacts associated with construction and operation of the proposed project, including the significance criteria applicable to assessing such impacts, is presented below.

Significant Threshold Criteria

According to the City of Santa Clarita Environmental Guidelines, a project would have a significant effect on the environment if it would

- (a) conflict with or obstruct implementation of the applicable air quality plan;
- (b) violate any air quality standard or contribute substantially to an existing or projected air quality violation;

¹¹⁸ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, April 1993), p. 9-9.

¹¹⁹ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, April 1993), p. 5-1, Figure 5-1; p. 5-7.

¹²⁰ The project study area includes all intersections and roadways that could potentially be significantly impacted by project traffic.

- (c) 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 which exceed quantitative thresholds for ozone precursors);
- (d) expose sensitive receptors to substantial pollutant concentrations; and/or
- (e) create objectionable odors affecting a substantial number of people.

The City of Santa Clarita typically refers to the thresholds recommended by the SCAQMD in its *CEQA Air Quality Handbook*. The following discusses the thresholds utilized in this analysis for both construction and operational emissions generated by the proposed project, as well as the threshold for cumulative impacts.

Construction Emission Thresholds

The SCAQMD recommends that projects with construction-related emissions that exceed any of the following emissions thresholds should be considered significant:¹²¹

- 75 pounds per day of VOC
- 100 pounds per day of NO_x
- 550 pounds per day of CO
- 150 pounds per day of SO_x
- 150 pounds per day of PM₁₀
- 55 pounds per day of PM_{2.5}

In addition to the above listed emission-based thresholds, the SCAQMD also recommends that the potential impacts on ambient air concentrations due to construction emissions from project-level proposed projects be evaluated. For project-level proposed projects, anticipated ambient air concentrations from projects larger than 5 acres in size is determined using a computer-based air quality dispersion model are compared to LSTs for PM₁₀, PM_{2.5}, NO₂, and CO.¹²² The SCAQMD's concentration-based PM₁₀ threshold from its Localized Significance Threshold Methodology (LST Methodology)¹²³ is a 24-hour average concentration of 10.4 micrograms per cubic meter (µg/m³) based on compliance with Rule 403 (Fugitive Dust). The threshold for PM_{2.5}, which is also 10.4 µg/m³, is intended

¹²¹ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), p. 6-4.

¹²² South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology* (Diamond Bar, California: South Coast Air Quality Management District, June 2003).

¹²³ South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, June 2003.

to constrain emissions so as to aid in progress toward attainment of the ambient air quality standards.¹²⁴ The thresholds for NO₂ and CO are based on the maximum concentrations that occurred during the last three years (i.e., 2004–2006) and represent the allowable increase in NO₂ and CO concentrations above background levels in the vicinity of the project that would not cause or contribute to an exceedance of the CAAQS.

An LST analysis was conducted for development of the proposed project. A more detailed description of the activities and methodology of the LST are described below. As discussed above, the concentration-based localized significance threshold for PM₁₀ and PM_{2.5} is a 24-hour average concentration of 10.4 µg/m³. The thresholds for NO₂ and CO are based on the maximum concentrations that occurred during the last three years (2004–2006). **Table 5.2-21, Localized Significance Threshold for SRA 13**, show the maximum allowable increase of pollutant concentrations above background levels in the vicinity of the project that would not cause or contribute to an exceedance of the relevant ambient air quality standards. The localized significance thresholds for SRA 13 (Santa Clarita Valley) along with the relevant CAAQS and NAAQS are shown in **Table 5.2-21**.

Table 5.2-21
Localized Significance Criteria for SRA 13

Pollutant	Averaging Period	CAAQS/NAAQS ¹		Peak Conc. in ppm	LST Criteria ²	
		µg/m ³	ppm		µg/m ³	ppm
Respirable Particulate Matter (PM ₁₀)	24 hours	50	NA	NA	10.4	NA
Fine Particulate Matter (PM _{2.5})	24 hours	35	NA	NA	10.4	NA
Nitrogen Dioxide (NO ₂)	1 hour	338	0.18	0.09	169	0.09
Carbon Monoxide (CO)	1 hour	23,000	20	5	17,164	15
Carbon Monoxide (CO)	8 hours	10,000	9.0	3.7	6,065	5.3

Source: South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003.

¹ California has not adopted a 24-hour AAQS for PM_{2.5}; the 24-hour PM_{2.5} AAQS shown is the national standard. All other standards are the California standards.

² LST Criteria for NO₂ and CO are the difference between CAAQS and the Peak Concentrations during the last three years (see **Table 5.2-20**).

¹²⁴ South Coast Air Quality Management District, *Final Methodology to Calculate Particulate Matter (PM)_{2.5} and PM₁₀ Significance Thresholds* (Diamond Bar, California: South Coast Air Quality Management District, October 2006).

Operational Emissions

The SCAQMD has recommended two types of air pollution thresholds to assist lead agencies in determining whether or not the operational phase of a project's development would be significant. These are identified in the following discussion under Emission Significance Thresholds and Additional Indicators of Potential Air Quality Impacts. The SCAQMD recommends that a project's impacts be considered significant if any of these operational thresholds are exceeded.

Emission Significance Thresholds

The SCAQMD has established these thresholds, in part, based on Section 182(e) of the federal CAA, which identifies 10 tons per year of VOC as the significance level for stationary sources of emissions in extreme nonattainment areas for ozone.¹²⁵ As discussed earlier, VOC and NO_x undergo photochemical reactions in sunlight to form ozone and the basin is the only extreme nonattainment area for ozone in the United States.¹²⁶ This emission threshold has been converted to a pound per day threshold for the operational phase of a project. Thresholds for other emissions have been identified based on other regulatory limits. Because they are converted from a CAA threshold, the SCAQMD believes that these thresholds are based on scientific and factual data.¹²⁷ Therefore, the district recommends that the following thresholds be used by lead agencies in making a determination of operation-related project significance¹²⁸

- 55 pounds per day of VOC
- 55 pounds per day of NO_x
- 550 pounds per day of CO
- 150 pounds per day of SO_x
- 150 pounds per day of PM₁₀
- 55 pounds per day of PM_{2.5}

¹²⁵ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), p. 6-1.

¹²⁶ The basin was designated as an extreme nonattainment area under the previous 1-hour ozone standard, which has been revoked for the more stringent 8-hour standard.

¹²⁷ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), p. 6-1.

¹²⁸ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), p. 6-2.

Additional Indicators of Potential Air Quality Impacts

The SCAQMD recommends that projects meeting any of the following criteria also be considered to have significant air quality impacts.¹²⁹

- Project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation.
- Project could result in population increases within an area which would be in excess of that projected by SCAG in the AQMP, or increase the population in an area where SCAG has not projected that growth for the project's buildout year.
- Project could generate vehicle trips that cause a CO hotspot or project could be occupied by sensitive receptors that are exposed to a CO hotspot.
- Project will have the potential to create, or be subjected to, an objectionable odor that could impact sensitive receptors.
- Project will have hazardous materials on site and could result in an accidental release of toxic air emissions or acutely hazardous materials posing a threat to public health and safety.
- Project could emit a TAC regulated by SCAQMD rules or that is on a federal or state air toxic list.
- Project could be occupied by sensitive receptors within 0.25 mile of an existing facility that emits air toxics identified in SCAQMD Rule 1401.
- Project could emit carcinogenic or TACs that individually or cumulatively exceed the maximum individual cancer risk of 10 in 1 million.

The following discussion reviews the project's potential impacts relative to each of the recommended significance criteria identified above.

Cumulative Significance Thresholds

The SCAQMD's *CEQA Air Quality Handbook* identifies three possible methods to determine the cumulative significance of land use projects. If the analysis shows that an individual project is consistent with the AQMP performance standards, the project's cumulative impact could be considered less than significant. If the analysis shows that the project does not comply with the standards, then cumulative impacts are considered to be significant unless there is other pertinent information to the contrary.

¹²⁹ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), pp. 6-2-6-3.

The performance standards recommended in the *CEQA Air Quality Handbook* include:

- Reduce the Rate of Growth in Vehicle Miles Traveled compared to Rate of Population Growth
- 1 Percent Per Year Reduction in Project Emissions of VOC, NO_x, CO, SO_x, and PM₁₀
- 1.5 Average Vehicle Ridership, or Average Vehicle Occupancy, if a Transportation Project

Construction-Related Impacts

Construction Emissions

As mentioned above, construction-related emissions can be designated as either on site or off site. On-site emissions generated during construction primarily consist of exhaust emissions (VOC, NO_x, CO, SO_x, PM₁₀, PM_{2.5}) from heavy-duty diesel powered construction equipment operation, fugitive dust (PM₁₀ and PM_{2.5}) from disturbed soil, and evaporative VOC emissions from asphalt paving and architectural coatings (i.e., painting). Off-site emissions during the construction phase normally consist of exhaust emissions from worker commute trips. Other potential off-site emissions during the construction phase can result from truck trips made for equipment and materials delivery, and to remove wastes and unused materials from the construction site.

Development of the Master Plan, Dockweiler and Deputy Jake extensions, 54 condominiums, and water tank removal and replacement would require site preparation and grading; pavement and asphalt installation (including infrastructure improvements); and construction. The proposed parkland dedication would not require any form of construction. During project buildout, emissions would be generated by on-site stationary (portable) sources, heavy-duty construction vehicles, on-road trucks, and construction worker vehicles. In addition, fugitive dust would be generated during grading operations.

Because of the construction time frame and the normal day-to-day variability in construction activities, it is difficult, if not impossible, to precisely quantify the daily emissions associated with each construction subphase. **Table 5.2-22, Estimated Unmitigated Construction Emissions**, nonetheless, conservatively identifies anticipated maximum daily emissions associated with each phase of construction based on information provided by the project applicant and on other information provided in the *Software Users' Guide [for] URBEMIS2007 for Windows* (November 2007).¹³⁰ Emission factors from the SCAQMD were

¹³⁰ Jones and Stokes Associates. *Software User's Guide: URBEMIS2007 for Windows Version 9.2*. [Online] May 19, 2008. <<http://www.urbemis.com>>.

used to generate emissions from construction worker vehicles,¹³¹ heavy-duty haul trucks,¹³² and heavy-duty off-road construction equipment.¹³³ Estimates of PM_{2.5} emissions from heavy-duty off-road construction equipment and fugitive dust were based on the PM_{2.5} fractions of PM₁₀ from the SCAQMD's *Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds*.¹³⁴ The PM_{2.5} emission factors for construction worker vehicle and heavy-duty were provided by the SCAQMD. The emissions are also estimated based on information and estimated activity levels provided by the applicant. Because all of the construction activities within each phase would not occur simultaneously, assumptions were made with respect to the anticipated type of activities that could occur at the same time and also produce the greatest combined impacts to air quality. The key emission estimation assumptions that are expected to result in the greatest impacts to air quality during each phase are as follows:

Phase 1

- Anticipated starting month and year: June 2009
- Anticipated development duration: 24 months
- Anticipated length of grading activities: 6 months
- Total number of acres of land to be graded: 48.9 acres
- Maximum acres graded per day: 5 acres
- Dust control measures: As required by SCAQMD Rule 403

Phase 2

- Anticipated starting month and year: June 2011
- Anticipated development duration: 48 months
- Maximum simultaneous emissions-generating activities: Utilities, Pedestrian Bridge, and Security Booth
- Dust control measures: As required by SCAQMD Rule 403

¹³¹ South Coast Air Quality Management District. Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Passenger Vehicles and Delivery Trucks [for] Projects in the SCAQMD (Scenario Years 2007-2026). <http://www.aqmd.gov/ceqa/handbook/onroad/onroadEF07_26.xls>.

¹³² South Coast Air Quality Management District. Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy Heavy-Duty Diesel Trucks [for] Projects in the SCAQMD (Scenario Years 2007-2026). <http://www.aqmd.gov/ceqa/handbook/onroad/onroadEFHHDT07_26.xls>.

¹³³ South Coast Air Quality Management District. SCAB Fleet Average Emission Factors (Diesel). <http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls>.

¹³⁴ South Coast Air Quality Management District, *Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (Diamond Bar, California: South Coast Air Quality Management District, October 2006).

Phase 3

- Anticipated starting month and year: June 2015
- Anticipated development duration: 48 months
- Anticipated asphalt paving schedule: 0.5 month
- Maximum simultaneous emissions-generating activities: 2 Classroom Buildings, Dormitory, and Asphalt Paving
- Maximum acres paved per day: 0.25 acre
- Asphalt material required per day: 99 cubic yards
- Dust control measures: As required by SCAQMD Rule 403

These assumptions have been entered into the spreadsheets that are available for review in **Appendix 5.2** of the EIR. These results are also based on the assumption that all of the construction equipment pertaining to the activities listed above in each subphase would operate continuously over an 8-hour period. In reality, this would not occur as most equipment would operate for only a fraction of each workday. Another assumption is that all construction equipment would be properly maintained, grading activities would conform to Rule 403 to control fugitive dust emissions, and that low VOC emission asphalt and architectural coating would be used. As shown in **Table 5.2-22**, the project's construction-related emissions are anticipated to exceed the NO_x and PM₁₀ SCAQMD construction threshold of significance during Phase 1 of the proposed project.

Table 5.2-22
Estimated Unmitigated Construction Emissions

Proposed Project Phase	Maximum Daily Emissions (lbs/day)					
	VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Phase 1	12.93	114.40	50.46	0.11	172.71	39.56
Phase 2	10.28	82.06	38.09	0.10	4.11	3.77
Phase 3	14.72	92.65	71.90	0.15	4.18	3.78
Maximum Emissions in Any Period	14.72	114.40	71.90	0.15	172.71	39.56
SCAQMD Thresholds	75	100	550	150	150	55
Exceeds Thresholds?	NO	YES	NO	NO	YES	NO

Source: Impact Sciences, Inc. Calculations can be found in **Appendix 5.2**.

It is expected that the project's construction-related activities will either emit the other criteria pollutants (i.e., sulfates, hydrogen sulfide, lead, vinyl chloride, and visibility reducing particles) in nominal quantities (i.e., sulfates), not at all (i.e., hydrogen sulfide, lead, and vinyl chloride), or will be accounted

for by the pollutants actually estimated in this analysis (i.e., visibility reducing particles). Note that NO_x and VOC are ozone precursors.

Localized Significance Threshold Analysis

An analysis of the construction-related impacts resulting from development of the proposed project on ambient air concentrations of PM₁₀, PM_{2.5}, NO₂, and CO was conducted. As required by the SCAQMD, this evaluation used a computer-based air quality dispersion model to determine potential ambient air concentrations of PM₁₀, PM_{2.5}, NO₂, and CO during construction activities. The emissions used in the air quality dispersion model represent the highest estimated daily mass emission rates of each pollutant that could occur on site at anytime during the construction period. Therefore, the maximum daily mass emissions for all pollutants were assumed to occur on the same day. In reality, it is unlikely that the maximum daily emissions for all pollutants would occur on the same day. Nevertheless, the LST analysis represents a conservative analysis. A more detailed description of the modeling parameters such as the emission sources and local receptors among others are discussed in **Appendix 5.2**. The results of the air quality dispersion modeling are compared with the LSTs in **Table 5.2-23, Localized Significance Thresholds Analysis – Residential Receptors**. **Table 5.2-23**, presents the maximum pollutant concentrations anticipated at residential receptors near the project site. The maximally impacted residential receptors are located on Deputy Jake Drive. As shown, the construction of the Dockweiler Drive and Deputy Jake Drive extensions and the Tentative Tract Map (condominium units) would cause localized significant impacts for PM₁₀ and PM_{2.5}.

Table 5.2-23
Localized Significance Thresholds Analysis – Residential Receptors

Pollutant	Averaging Period	Modeling Results		LST Criteria		Exceeds Threshold?
		µg/m ³	ppm	µg/m ³	ppm	
Respirable Particulate Matter (PM ₁₀)	24 hours	234	NA	10.4	NA	YES
Fine Particulate Matter (PM _{2.5})	24 hours	57.0	NA	10.4	NA	YES
Nitrogen Dioxide (NO ₂)	1 hour	115	0.06	169	0.09	NO
Carbon Monoxide (CO)	1 hour	657	0.57	17,164	15	NO
Carbon Monoxide (CO)	8 hours	534	0.47	6,065	5.3	NO

Source: South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003.

¹ LST Criteria for NO₂ and CO are the difference between CAAQS and the Peak Concentrations during the last three years (see **Table 5.2-21**).

Table 5.2-24, Localized Significance Thresholds Analysis – School Receptors, presents the maximum anticipated pollutant concentrations anticipated at schools near the project site. The maximally impacted school receptor would be the J. Michael McGrath Elementary School. As shown below in **Table 5.2-24**,

construction of the Dockweiler Drive and Deputy Jake Drive extensions and the Tentative Tract Map (condominium units) would cause localized significant impacts for PM₁₀.

Table 5.2-24
Localized Significance Thresholds Analysis – School Receptors

Pollutant	Averaging Period	Modeling Results		LST Criteria		Exceeds Threshold?
		µg/m ³	ppm	µg/m ³	ppm	
Respirable Particulate Matter (PM ₁₀)	24 hours	18.8	NA	10.4	NA	YES
Fine Particulate Matter (PM _{2.5})	24 hours	5.0	NA	10.4	NA	NO
Nitrogen Dioxide (NO ₂)	1 hour	67.9	0.04	169	0.09	NO
Carbon Monoxide (CO)	1 hour	133	0.12	17,164	15	NO
Carbon Monoxide (CO)	8 hours	91.5	0.08	6,065	5.3	NO

Source: South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, June 2003.

¹ LST Criteria for NO₂ and CO are the difference between CAAQS and the Peak Concentrations during the last three years (see Table 5.2-21).

Construction-Related Health Impacts of Toxic Air Contaminants

Equipment used during project construction would emit diesel particulate matter. CARB has identified diesel particulate matter as a TAC and the Office of Environmental Health Hazard Assessment (OEHHA) has established a non-cancer chronic (long-term) reference exposure level (REL) and a cancer risk factor assuming continuous exposure over a 70-year time frame. OEHHA has not developed a non-cancer acute (short-term) REL for diesel particulate matter. It is assumed that construction activity for individual project components and Master Plan phases would last for approximately two years at maximum. Additionally, construction activity for the individual projects within the master plan would occur at various sites throughout The Master's College campus; many of the sites are centrally located and not directly adjacent to existing off-site receptors. For these reasons, it is anticipated that an off-site receptor would not be exposed to long-term construction diesel particulate matter emissions. Therefore, no significant impacts are anticipated.

Construction Emissions Conclusions

Because project construction emissions are anticipated to exceed the SCAQMD's thresholds of significance for NO_x and PM₁₀ during Phase 1 of the proposed project, the emission levels are considered potentially significant and feasible mitigation is required. In addition, the LST analysis determined that construction of the proposed project would result in localized significant impacts for PM₁₀ and PM_{2.5}. The effectiveness of the proposed mitigation in reducing these potentially significant adverse air quality impacts is discussed below under the **Mitigation Measures** subheading.

Operational Impacts

Daily Emissions

Operational emissions would be generated by area, and mobile sources as a result of normal day-to-day activities on the project site after buildout.

Area and Mobile Source Emissions

Area source emissions would be generated during the consumption of natural gas for space and water heating devices, by natural gas fireplaces, and during the operation of gasoline-powered landscape maintenance equipment and use of consumer products (e.g., hair spray, deodorants, lighter fluid, air fresheners, automotive products, and household cleaners). Mobile source emissions would be generated by the motor vehicles traveling to and from and within the project site.

This analysis considers the net change in area and mobile source emissions. Inputting project land use characteristics and trip generation information from The Master's College Traffic Impact Analysis and the above project assumptions, URBEMIS2007 was used to calculate area and mobile source emissions from the proposed project for both summertime and wintertime emissions. The primary difference between the summertime and the wintertime emissions is that natural gas fireplaces would only generate emissions during wintertime and landscape maintenance would only generate emissions during the summertime. In addition, URBEMIS2007 can generate mobile and area source emission factors specific to the operational year and location of the proposed project. For the purpose of this analysis, the buildout year (i.e., 2019) and Los Angeles County were used to estimate area and mobile source emissions. The project's area and mobile source emissions, as estimated using URBEMIS2007, are shown in **Table 5.2-25, Estimated Operational Emissions Without Mitigation**. The table does not reflect any mitigation measures.

Additional Indicators of Potential Air Quality Impacts

As previously discussed, the SCAQMD lists additional criteria indicating when a project may create potential air quality impacts.¹³⁵ These criteria are listed below along with an analysis of whether or not the project meets any of them. If a project meets any one of the criteria, project air quality impacts would be significant relative to that criterion.

- Project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation.

¹³⁵ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), pp. 6-2–6-3.

**Table 5.2-25
Estimated Operational Emissions Without Mitigation**

Emissions Source	Emissions in Pounds per Day					
	VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Summertime Emissions¹						
Mobile Sources	9.50	8.93	86.12	0.17	28.19	5.46
Area Sources						
Natural Gas	0.08	1.01	0.63	0.00	0.00	0.00
Landscape Maintenance	0.25	0.04	3.09	0.00	0.01	0.01
Consumer Products	2.77	—	—	—	—	—
Architectural Coatings	0.38	—	—	—	—	—
Area Source Subtotal	3.48	1.05	3.72	0.00	0.01	0.01
Summertime Emission Totals:	12.98	9.98	89.84	0.017	28.20	5.47
Recommended Threshold:	55	55	550	150	150	55
Exceeds Threshold?	NO	NO	NO	NO	NO	NO
Wintertime Emissions²						
Mobile Sources	8.76	10.77	80.57	0.14	28.19	5.46
Area Sources						
Natural Gas	0.08	1.01	0.63	0.00	0.00	0.00
Hearth	8.46	0.64	23.43	0.07	3.63	3.50
Consumer Products	2.77	—	—	—	—	—
Architectural Coatings	0.38	—	—	—	—	—
Area Source Subtotal	11.69	1.65	24.06	0.07	3.63	3.50
Wintertime Emission Totals:	20.45	12.42	104.63	0.21	31.82	8.96
Recommended Threshold:	55	55	550	150	150	55
Exceeds Threshold?	NO	NO	NO	NO	NO	NO

Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 5.2**.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

¹ Summertime Emissions" are representative of the conditions that may occur during the ozone season (May 1 to October 31).

² Wintertime Emissions" are representative of the conditions that may occur during the balance of the year (November 1 to April 30).

SCAQMD's *CEQA Air Quality Handbook* suggests that an air quality modeling analysis (i.e., dispersion modeling) may be performed that identifies the project's potential impact on regional ambient air quality. A project would not create potential significant adverse air quality impacts if the dispersion modeling demonstrates that the project's incremental emissions would not increase the frequency or the severity of

existing air quality violations, or contribute to a new violation.¹³⁶ It has already been demonstrated that the project's CO emissions would not exceed the established significance criteria. With respect to the other pollutants (i.e., NO_x, SO_x, VOC, and PM₁₀), SCAQMD staff have stated that air quality dispersion models do not currently exist for general development projects that can determine if the project's NO_x, SO_x, VOC, and PM₁₀ emissions would increase the frequency or the severity of existing regional air quality violations, or contribute to a new violation.¹³⁷ Therefore, no such air quality dispersion analysis can be undertaken for this project.

As shown in **Table 5.2-25**, the project at buildout and in full operation would generate total summer- and wintertime emissions of VOC, NO_x, CO, SO_x, PM₁₀, and PM_{2.5} that are not anticipated to exceed the SCAQMD recommended thresholds. However, as the amount of emissions under the proposed project would exceed the recommended significance thresholds for construction emissions, project air quality impacts would be significant during the construction phase.

Instead, SCAQMD staff state that a project's consistency with the population number and location assumptions identified by SCAG and used in the preparation of the 2007 AQMP should be assessed as required by the next criterion.

- Project could result in population increases within an area that would be in excess of that projected by SCAG in the AQMP, or increase the population in an area where SCAG has not projected that growth for the project's buildout year.

The 2007 AQMP is designed to accommodate planned growth, to reduce the high levels of pollutants within the areas under the jurisdiction of SCAQMD, to return clean air (i.e., attain O₃ standard) to the region by 2021, and to minimize the impact on the economy. Projects that are considered to be consistent with the AQMP do not interfere with attainment and do not contribute to the exceedance of an existing air quality violation because this growth is included in the projections utilized in the formulation of the AQMP. Therefore, projects, uses, and activities that are consistent with the applicable assumptions used in the development of the AQMP would not jeopardize the long-term attainment of the air quality levels identified in the AQMP, even if they exceed the SCAQMD's recommended thresholds.

Future air emissions within the basin are based on demographic projections developed by SCAG for its 2004 RTP.¹³⁸ Projects that are consistent with the projections of population forecasts identified in the

¹³⁶ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), p. 12-3.

¹³⁷ Interview with Steve Smith, South Coast Air Quality Management District, Diamond Bar, California, February 23, 1996.

¹³⁸ South Coast Air Quality Management District, "2007 AQMP," <<http://www.aqmd.gov/aqmp/07aqmp/index.html>>, p. 3-1.

2004 RTP are considered consistent with the AQMP growth projections. The proposed project would require an amendment to the Land Use and Circulation Elements of the City of Santa Clarita General Plan. The portion of the college north of Placeritos Boulevard would be redesignated from RL (Residential Low) to PE (Private Education), which would then be consistent with the college south of Placeritos Boulevard. The area where the 54 condominiums are proposed would be redesignated from PE to RM (Residential Moderate). Lastly, the Circulation Element would be amended to redesignate Dockweiler Drive from a Major Highway to a four-lane Secondary Highway. Because the general plan is consistent with the 2007 AQMP and the proposed project would amend the general plan, the project could jeopardize attainment of state and federal ambient air quality standards in the Santa Clarita Valley area or the basin. However, the general plan amendment would change areas designated for residential use to educational use and areas designated for educational uses to residential uses, thereby offsetting the change in land use.¹³⁹ Furthermore, the amendment to the Circulation Element would change Dockweiler Drive from a Major Highway to a Secondary Highway, which would reduce the amount of vehicles and vehicle miles traveled (VMT) on the proposed roadway when compared to what was previously planned. Therefore, it is not anticipated that the proposed general plan amendment would jeopardize attainment of any state or federal ambient air quality standards.

Another means of assessing 2007 AQMP consistency for this criterion is to determine how a project accommodates the expected increase in population and employment. Generally, if a project is planned in a way that minimizes VMT both within the project and in the community in which it is located, and consequently the minimization of air pollutant emissions, that project is deemed to be consistent with the 2007 AQMP.¹⁴⁰

As discussed earlier, The Master's College expansion project will include on-site dormitories, pedestrian walkways, bicycle lanes, and trails which will all serve to decrease automobile use. As such, the project would minimize VMT both within the project and within the community of Santa Clarita as it builds out.

- Project could generate vehicle trips that cause a CO hotspot or project could be occupied by sensitive receptors that are exposed to a CO hotspot.

As previously mentioned, traffic-congested roadways and intersections that operate at a level of service (LOS) D, E, or F have the potential to generate localized high levels of CO within approximately 1,000 feet of a roadway. According to the UC Davis Transportation Project-Level Carbon Monoxide Protocol, if an

¹³⁹ It should be noted that a Residential Low area would be changed to a Private Education, while another area designated as Private Education would be changed to Residential Moderate. The increase from Residential Low to Residential Moderate would be a minor change and is not expected to hamper attainment of state or federal ambient air quality standards.

¹⁴⁰ South Coast Air Quality Management District, *CEQA Air Quality Handbook*, (Diamond Bar, California: South Coast Air Quality Management District, November 1993), p. 12-5.

intersection operates at a LOS of E or F, it is considered to have the potential for a CO violation and is required to be further analyzed.¹⁴¹ Also, if project traffic volume worsens an intersection's LOS to E or F from a LOS D or above, this intersection represents a potential for a CO violation and would be required to be further analyzed.¹⁴² For the purposes of this analysis, all intersections operating at LOS D or worse were analyzed for the potential of CO hotspots. The project traffic report identifies 10 intersections that would be operating at a LOS D, E, or F during full project build out. The following intersections were analyzed for potential CO hotspots:

- Railroad Avenue and 13th Street
- Railroad Avenue and Lyons Avenue
- Newhall Avenue and Lyons Avenue
- Valle Del Oro and Dockweiler Drive
- Valle Del Oro and Deputy Jake Drive
- Valle Del Oro and Newhall Avenue
- Sierra Highway and Dockweiler Drive
- Sierra Highway and Newhall Avenue
- SR-14 Southbound Ramps and Newhall Avenue
- SR-14 Northbound Ramps and Newhall Avenue

Maximum existing CO concentrations for project study intersections were calculated for peak hour traffic volumes at each of these intersections using a screening approach based on CALINE4, a dispersion model for predicting CO concentrations near roadways. For this analysis, CO concentrations were calculated based on a simplified CALINE4 screening model developed by the Bay Area Air Quality Management District (BAAQMD). The simplified model is intended as a screening analysis that identifies a potential CO hotspot. If a hotspot is identified, the complete CALINE4 model is then utilized to determine precisely the CO concentrations predicted at the intersections in question. This methodology assumes worst-case conditions (i.e., wind direction parallel to the primary roadway and 90 degrees to the secondary road, wind speed of less than 1 meter per second and extreme atmospheric stability) and provides a screening of maximum, worst-case CO concentrations. This method is acceptable to the

¹⁴¹ University of California at Davis, Institute of Transportation Studies, Transportation Project-Level Carbon Monoxide Protocol (Davis, CA: California Department of Transportation, December 1997), Section 4.7.3 and 4.7.4.

¹⁴² Ibid.

SCAQMD as long as it is used consistently with the *BAAQMD Guidelines*.¹⁴³ The CO concentrations at 0 and 25 feet from the roadway at each of the project-impacted intersections are shown below in **Table 5.2-26, Cumulative Plus Full Project Buildout Carbon Monoxide Concentrations**. The cumulative year analyzed by the traffic study corresponds to a horizon year from 2018 to 2020 based on anticipated Santa Clarita Valley growth rates.¹⁴⁴ The anticipated buildout year of the proposed project is 2019, which is within the cumulative horizon year range. Nevertheless, for a conservative analysis, year 2018 emission factors from EMFAC2007 were used to estimate CO concentrations at intersections in the project's vicinity.¹⁴⁵

**Table 5.2-26
Cumulative Plus Full Project Buildout Carbon Monoxide Concentrations**

Intersection	0 Feet		25 Feet	
	1-Hour	8-Hour	1-Hour	8-Hour
1. San Fernando Road and 13 th Street	8.4	5.4	7.4	4.7
2. San Fernando Road/Railroad Avenue and Lyons Avenue	8.4	5.4	7.5	4.7
3. Newhall Avenue and Lyons Avenue	8.1	5.2	7.3	4.6
4. Valle Del Oro and Dockweiler Drive	6.9	4.3	6.5	4.1
5. Valle Del Oro and Deputy Jake Drive	6.4	4.0	6.2	3.9
6. Valle Del Oro and San Fernando Road	8.1	5.2	7.3	4.6
7. Sierra Highway and Dockweiler Drive	7.6	4.9	7.0	4.4
8. Sierra Highway and San Fernando Road	8.2	5.3	7.5	4.7
9. SR-14 Southbound Ramps and San Fernando Road	8.4	5.4	7.4	4.7
10. SR-14 Northbound Ramps and San Fernando Road	7.7	4.9	6.9	4.3
Exceeds state 1-hour standard of 20 ppm?	NO	NO	NO	NO
Exceeds federal 1-hour standard of 35 ppm?	NO	NO	NO	NO
Exceeds state 8-hour standard of 9.0 ppm?	NO	NO	NO	NO
Exceeds federal 8-hour standard of 9 ppm?	NO	NO	NO	NO

Source: Impact Sciences, Inc. Emissions calculations are provided in *Appendix 5.2*.

¹⁴³ Personal communication with Steve Smith, Program Supervisor, South Coast Air Quality Management District, Diamond Bar, California, May 12, 2004.

¹⁴⁴ Austin-Foust Associates, Inc.. 2007. *Masters College Master Plan Traffic Impact Analysis*.

¹⁴⁵ Emission factors for year 2018 would be higher than 2019 and 2020 due to the phase-out of older vehicles and and phase-in of cleaner vehicles into the fleet.

As shown in **Table 5.2-26**, the state and federal 1- and 8-hour CO standards would not be exceeded at project buildout, and the contribution of cumulative projects and the proposed project traffic to CO concentrations at these intersections would not be considered significant.

- Project will have the potential to create, or be subjected to, an objectionable odor that could impact sensitive receptors.

Uses proposed by the master plan, the extension of Dockweiler Drive and Deputy Jake Drive, 54 condominium units, parkland/open space dedication and water tank removal and replacement would not generate objectionable odors. Consequently, no significant impacts from such odors are anticipated.

- Project will have hazardous materials on site and could result in an accidental release of toxic air emissions or acutely hazardous materials posing a threat to public health and safety.

Uses proposed by the master plan, the extension of Dockweiler Drive and Deputy Jake Drive, 54 condominium units, parkland/open space dedication and water tank removal and replacement would not have hazardous materials on site and could result in an accidental release of toxic air emissions or acutely hazardous materials. Consequently, no significant impacts from such materials are anticipated.

- Project could emit a toxic air contaminant regulated by SCAQMD rules or that is on a federal or state air toxic list.

The proposed residential, recreational, and limited institutional uses on the site would not be anticipated to emit a toxic air contaminant regulated by SCAQMD rules or that is on a federal or state air toxic list. The proposed educational uses may consist of laboratories that could contain small amounts of chemicals typical of a university classroom laboratory. Only a portion of these chemicals may contain regulated toxic air contaminants (TACs). Therefore, trace quantities of toxic air emissions may be emitted during periodic classroom laboratory experiments. However, such trace emissions would occur infrequently, given the size of the student population, and would not exceed the thresholds contained in SCAQMD Rule 1401, New Source Review of Toxic Air Contaminants. Thus, it would not be subject to its requirements. Furthermore, laboratory equipment used for chemical or physical analysis is exempt from SCAQMD permit requirements via Rule 219, Equipment Not Requiring a Written Permit Pursuant to Regulation II. Consequently, no significant impacts from such emissions are anticipated.

- Project could be occupied by sensitive receptors within 0.25 mile of an existing facility that emits air toxics identified in SCAQMD Rule 1401.

The proposed project site is not located within 0.25 mile of an existing facility that emits air toxics identified in SCAQMD Rule 1401. Consequently, no significant impacts are anticipated with respect to this criterion.

- Project could emit carcinogenic or toxic air contaminants that individually or cumulatively exceed the maximum individual cancer risk of 10 in 1 million.

The proposed uses would not emit substantial levels of carcinogenic or toxic air contaminants. Nominal amounts of carcinogenic or toxic air contaminants would be emitted from the combustion of natural gas from boilers and water heaters and from the combustion of gasoline from miscellaneous landscaping equipment; however, the amount is not anticipated to exceed the maximum individual cancer risk of 10 in 1 million. Consequently, no significant impacts from such emissions are anticipated.

Operation-Related Health Impacts of Toxic Air Contaminants

Regulated TAC emissions are not expected to occur in conjunction with operation of the proposed development and, as a result, no significant impacts would occur under those criteria stated above. Further, all regulated point sources of emissions associated with the project's limited commercial uses, should they occur, must be permitted and must use toxic best available control technologies (T-BACT) before they can receive a permit.¹⁴⁶ Compliance with the permit would reduce TACs to less than significant. The receipt and maintenance of SCAQMD permits represent verification that any such sources would not result in a significant impact under the first two and last criteria.

As to off-site sources of TACs, the project is not located within 0.25 mile of an existing facility that emits TACs as identified in SCAQMD Rule 1401, Table I.

Greenhouse Gas Emissions

As noted above, the primary source of GHGs in California is fossil fuel combustion. The primary GHG associated with fuel combustion is carbon dioxide, with lesser amounts of methane and nitrous oxide. Accordingly, the project would result in emissions of these GHGs due to fuel combustion in motor vehicles and building heating systems associated with the project. Building and motor vehicle air conditioning systems may use HFCs (and HCFCs and CFCs to the extent that they have not been completely phased out at later dates), which may result in emissions through leaks. The other GHGs (perfluorocarbons and sulfur hexafluoride) are associated with specific industrial sources and are not expected to be associated with the proposed project.

While the project would result in emissions of GHGs, the significance of the impact of a single project on global climate cannot be determined at this time. First, no guidance exists to indicate what level of GHG

¹⁴⁶ South Coast Air Quality Management District, Rule 1401 – New Source Review of Toxic Air Contaminants, (Diamond Bar, California: South Coast Air Quality Management District, Amended March 4, 2005). Rule 1401 may be viewed on-line at <<http://www.aqmd.gov/rules/reg/reg14/r1401.pdf>>.

emissions would be considered substantial enough to result in a significant adverse impact on global climate. Even though the GHG emissions associated with an individual development project could be estimated, there is no emissions threshold that can be used to evaluate the significance of these emissions. Second, global climate change models are not sensitive enough to be able to predict the effect of a single project on global temperatures and the resultant effect on climate; therefore, they cannot be used to evaluate the significance of a project's impact. Thus, insufficient information and predictive tools exist to assess whether a single project would result in a significant impact on global climate. For these reasons, determining the significance of the impact of the project on global climate is speculative.

Operational Impacts Conclusion

Operational-related emissions of criteria pollutants generated by the project are not anticipated to exceed SCAQMD recommended emission thresholds of significance for these pollutants and, for that reason, they are considered less than significant.

The project would be consistent with the 2007 AQMP; therefore, it would not jeopardize the long-term attainment of the air quality standards predicted in that document. The project also does not exceed or demonstrate a conflict with the additional indicators of potential air quality impacts.

MITIGATION MEASURES

The proposed project would result in potentially significant regional air quality impacts for NO_x and PM₁₀ during the first phase of construction. In addition, the localized significant impacts of PM₁₀ and PM_{2.5} associated with construction activities of the Dockweiler Drive and Deputy Jake Drive and the Tentative Tract Map (54 condominiums) are also considered significant and unavoidable.¹⁴⁷ Therefore, mitigation measures are required to be implemented as part of the project.

Mitigation Measures Already Incorporated into the Project

No mitigation measures pertaining to air quality have been incorporated into the project.

Construction Mitigation Measures Recommended by this EIR

The following recommended mitigation measures would reduce construction-related emissions to some extent; however, the resultant benefit of the mitigation measures cannot be quantified because the specific details of the construction plans and equipment is unknown. Moreover, it is not expected that feasible mitigation exists that would reduce these emissions to a sufficient degree that the construction-related

¹⁴⁷ Construction of the proposed project would cause localized significant impacts for PM₁₀ and PM_{2.5} at residential receptors and for PM₁₀ at school receptors.

emissions would be below the SCAQMD's emission-based thresholds of significance. For these same reasons, implementation of these mitigation measures would not be likely to reduce the impacts to less than significant levels. Therefore, construction-related emissions for the proposed project would be considered significant and unavoidable.

- 5.2-1: Develop a construction traffic management plan to minimize emissions from vehicles including, but not limited to, scheduling truck deliveries to avoid peak hour traffic conditions, consolidating truck deliveries, and prohibiting truck idling in excess of 5 minutes.
- 5.2-2: Suspend the use of all construction equipment during first-stage smog alerts.
- 5.2-3: Use electricity or alternate fuels for on-site mobile equipment instead of diesel equipment to the extent feasible.
- 5.2-4: Maintain construction equipment by conducting regular tune-ups according to the manufacturers' recommendations.
- 5.2-5: Use electric welders to avoid emissions from gas or diesel welders, to the extent feasible.
- 5.2-6: Use on-site electricity or alternative fuels rather than diesel-powered or gasoline-powered generators to the extent feasible.
- 5.2-7: Prior to use in construction, the project applicant will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for significant periods. Retrofit technologies such as particulate traps, selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc., will be evaluated. These technologies will be required if they are certified by CARB and/or the US EPA and are commercially available and can feasibly be retrofitted onto construction equipment.
- 5.2-8: Reduce traffic speeds on all unpaved roads to 15 miles per hour or less.
- 5.2-9: Water active sites at least three times daily during dry weather.

CUMULATIVE IMPACTS

The *CEQA Air Quality Handbook* identifies possible methods to determine the cumulative significance of land use projects.¹⁴⁸ These methods are different than the methodology for construction and operational impacts used throughout the remainder of this EIR in which all foreseeable future development within a given service boundary or geographical area is predicted and its impacts measured. The SCAQMD staff has suggested that the emissions-based thresholds be used to determine if a project's contribution to regional cumulative emissions is cumulatively considerable.¹⁴⁹ In addition, the relevant methods for determining cumulative impacts in the *CEQA Air Quality Handbook*, which are based on performance standards and emission reduction targets necessary to attain the federal and state air quality standards identified in the AQMP, are also evaluated. This EIR evaluates the following methods: (1) the SCAQMD method of whether the rate of growth in average daily trips exceeds the rate of growth in population; and (2) whether or not the project is consistent with 2007 AQMP and, thus, would not jeopardize attainment of state and federal ambient air quality standards in the basin.

The SCAQMD's approach towards assessing cumulative impacts is based on the fact that the AQMP forecasts attainment of ambient air quality standards inclusive of growth in population, employment, and VMT. The 2007 AQMP was prepared to accommodate growth, to reduce the high levels of pollutants within the basin, to meet state and federal air quality standards, and to minimize the fiscal impact that pollution control measures have on the local economy. Projects found to be consistent with the growth assumptions upon which the AQMP forecasts are based are deemed to be consistent with the AQMP and would not impede attainment of the ambient air quality standards. Once fully developed and occupied, the proposed project, as well as the other projects being proposed and developed in the area, are expected to be within the growth forecasts contained in the Growth Management Chapter (GMC) of the SCAG's Regional Comprehensive Plan and Guide (RCPG), which forms the basis for the land use and transportation control portions of the SCAQMD's AQMP. The RCPG serves as a regional framework for decision making for the growth and change that is anticipated during the next 20 years and beyond. The GMC of the RCPG contains population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council that reflect local plans and policies that shall be used by SCAG in all phases of implementation and review. It states that the overall goals for the region are to (1) re-invigorate the region's economy, (2) avoid social and economic inequities and the geographical isolation of communities, and (3) maintain the region's quality of life. Thus, from this perspective, the proposed project is not expected to jeopardize attainment of state and federal ambient air quality standards.

¹⁴⁸ South Coast Air Quality Management District, *CEQA Air Quality Handbook* (Diamond Bar, California: South Coast Air Quality Management District, April 1993), p. 9-12.

¹⁴⁹ Personal communication with Steve Smith, Program Supervisor, South Coast Air Quality Management District, Diamond Bar, California, Personal communication with David Deckman, Impact Sciences, April 19, 2006.

An additional analysis that evaluates the proposed project's cumulative impacts is based on performance standards that are recommended in the SCAQMD's *CEQA Air Quality Handbook* and that are appropriate to the proposed project. As specified in the *CEQA Air Quality Handbook*, the ratio of project's VMT or average daily trips (ADT) to anticipated VMT or ADT in the city or county in which the project is located is compared to the ratio of the project population to the anticipated population in the same city or county.¹⁵⁰ If the growth of VMT or ADT is less than the population growth, then the project is not considered to have a significant cumulative air quality impact. The relevant values are shown in **Table 5.2-27, Comparison of Growth of ADT to Population Growth**. As shown in **Table 5.2-27**, this criterion has not been exceeded, and therefore, the project would be considered to have a less than significant cumulative impact on air quality under this criterion.

**Table 5.2-27
Comparison of Growth of ADT to Population Growth**

	Average Daily Trips	Population
Proposed Project	1,750	667
Los Angeles County	43,422,764	11,346,639
Ratio of Project to Los Angeles County	0.04	0.06

Source: Impact Sciences, Inc., Estimated project ADT from URBEMIS2007 output data (see Appendix 5.2 of this EIR). Estimated ADT in the SCAB portion of Los Angeles County in 2018 (project build out year used in the URBEMIS2007 model file) as determined by EMFAC2007. Estimated aggregated population in the SCAB portion of Los Angeles County in 2018. Source: Southern California Association of Governments, "City Projections," <http://scag.ca.gov/forecast/index.htm>.

SIGNIFICANT UNAVOIDABLE IMPACTS

Project-Specific Impacts

Although the recommended mitigation measures, if feasible, would reduce the magnitude of construction emissions to some extent, no feasible mitigation exists that would reduce all of these emissions to below the SCAQMD's recommended thresholds of significance. The project's construction-related emissions of NO_x and PM₁₀ are considered significant and unavoidable. In addition, the localized significant impacts of PM₁₀ and PM_{2.5} associated with construction activities of the Dockweiler Drive and Deputy Jake Drive and the Tentative Tract Map (54 condominiums) are also considered significant and unavoidable.

While the project's construction air emissions would be unavoidably significant, it is important to note that the project incorporates student housing on site as well as recreational amenities, thus reducing the

¹⁵⁰ South Coast Air Quality Management District, *CEQA Air Quality Handbook* (Diamond Bar, California: South Coast Air Quality Management District, April 1993), p. A9-126.

number of VMT to these locations. Consequently, because VMT would be reduced, air emissions would be reduced as well. The project is also consistent with the 2007 AQMP; therefore, based on SCAQMD methods of analysis, project emissions should not jeopardize the long-term attainment of state and federal ambient air quality standards in the Santa Clarita Valley and the region.

Cumulative Impacts

No significant cumulative impacts to air quality would result from Valley buildout, which would include the proposed project.