4.3 AIR QUALITY

The following section analyzes the proposed project's potential air quality impacts based on a comprehensive Air Quality Impact Analysis and supplemental Green House Gas calculation spreadsheets contained in Appendix B (LSA Associates, Inc., August 2006). The air quality study provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The analysis provides data on existing air quality, evaluates potential air quality impacts associated with the proposed project, and identifies mitigation measures recommended for potentially significant impacts. Modeled air quality levels are based upon vehicle data and project trip generation included in a traffic study prepared for the proposed project (LSA Associates, Inc., September, 2006). The evaluation was prepared in conformance with appropriate standards, utilizing procedures and methodologies in the Mojave Desert Air Quality Management District (MDAQMD) in its *CEQA and Federal Conformity Guidelines* (July 2006).

4.3.1 Existing Setting

Regional Air Quality

The project site is located in the Mojave Desert Air Basin (Basin), a geographic area separated from Coastal Southern California and the Central Valley by mountain ranges. The basin includes the high desert region of San Bernardino County and eastern Riverside County. Depending on location, air quality regulation in the Basin is administered by one of four air quality control districts. The proposed project site is located within the jurisdictional area of the Mojave Desert Air Quality Management District, a regional agency created within the Basin.

The Basin periodically experiences elevated levels of ozone and suspended particulate matter. The ozone levels in the Basin are caused in large part by transport of ozone from urban coastal areas. Elevated levels of particulate matter less than 10 micrometers (PM_{10}) throughout the Basin are primarily attributed to high wind events in rural desert areas and to fugitive dust sources in and around more populated areas.[1] Based on these conditions, the region is currently designated as "nonattainment" under State and federal ozone ambient air quality standards and also under PM_{10} ambient air quality standards.[2] The nonattainment designations include a "severe-17" classification for federal ozone standards under the Clean Air Act (CAA), which means the region must come into compliance with federal ozone standards by November 15, 2007 (17 years from the date the federal Clean Air Act Amendments of 1990 were enacted).

Local Air Quality

The MDAQMD maintains ambient air quality monitoring stations throughout the Basin. The air quality monitoring station closest to the site is the Joshua Tree National Monument station. This station only provides data for one-hour and eight-hour ozone levels. The next closest monitoring station, the Twentynine Palms-Adobe Road #2 station, provides PM_{10} data in addition to the one-hour

[1] *Mojave Desert Planning Area Federal Particulate Matter Attainment Plan*, Mojave Desert Air Quality Management Plan, July 31, 1995.

[2] *California Environmental Quality Act and Federal Conformity Guideline*s, Mojave Desert Air Quality Management District, December 1999.

and eight-hour ozone levels. The monitoring station nearest the project site that provides more complete air quality data is the Palm Springs Fire Station. The Palm Springs Fire Station is located in Riverside County. The nearest air quality monitoring station located in San Bernardino County that monitors sulfur dioxide is the Victorville station. The criteria pollutants monitored at these stations are identified in Table 4.3.A. Ozone levels have exceeded State and federal levels at the Joshua Tree station multiple times in the past three years. PM_{10} levels have exceeded State standards at the Twentynine Palms station multiple times in the last three years, but have not exceeded the federal standard. $PM_{2.5}$ levels have exceeded State and/or federal standards at the Palm Springs station. The sulfur dioxide levels monitored at the Victorville station have not exceeded State and federal standards in the past three years.

Table 4.3.A – Ambient Air Quality at Joshua Tree, Twentynine Palms, and Victorville Air Monitoring Stations

Pollutant	Standard	2003	2004	2005
Carbon Monoxide (CO) (Victorville)				
Maximum 1-hr concentration (ppm)		3.9	2.4	2.5
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hr concentration (ppm)		2.1	1.7	1.6
Number of days exceeded:	State: ≥ 9.0 ppm	0	0	0
	Federal: ≥ 9 ppm	0	0	0
Ozone (O_3) (Joshua Tree)				
Maximum 1-hr concentration (ppm)		0.140	0.137	0.131
Number of days exceeded:	State: > 0.09 ppm	41	35	38
Maximum 8-hr concentration (ppm)		0.119	0.107	0.112
Number of days exceeded:	State: ≥ 0.07 ppm	ND	ND	ND
	Federal: > 0.08 ppm	39	31	35
Coarse Particulates (PM_{10}) (Twentynine Palms)				
Maximum 24-hr concentration ($\mu g/m^3$)		70.0	43.0	58.0
Number of days exceeded:	State: > 50 $\mu g/m^3$	3	0	2
	Federal: > 150 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		17.3	15.1	19.2
Exceeded for the year:	State: > 20 $\mu g/m^3$	N	N	N
	Federal: > 50 $\mu g/m^3$	N	N	N
Fine Particulates ($PM_{2.5}$) (Victorville)				
Maximum 24-hr concentration ($\mu g/m^3$)		28.0	34.0	27.0
	Federal: > 65 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		11.4	10.8	9.4
Exceeded for the year:	State: > 12 $\mu g/m^3$	N	N	N
	Federal: > 15 $\mu g/m^3$	N	N	N
Nitrogen Dioxide (NO_2)				
Maximum 1-hr concentration (ppm)		0.090	0.080	0.077
Number of days exceeded:	State: > 0.25 ppm	0	0	0

Table 4.3.A – Ambient Air Quality at Joshua Tree, Twentynine Palms, and Victorville Air Monitoring Stations

Pollutant	Standard	2003	2004	2005
Annual arithmetic average concentration (ppm)		0.022	0.021	0.019
	Federal: > 0.053 ppm	N	N	N
Sulfur Dioxide (SO_2)				
Maximum 1-hr concentration (ppm)		0.011	0.011	0.012
	State: > 0.25 ppm	0	0	0
Maximum 3-hr concentration (ppm)		0.010	0.007	0.008
	Federal: > 0.5 ppm	0	0	0
Maximum 24-hr concentration (ppm)		0.006	0.003	0.003
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.002	0.001	0.001
Exceeded for the year:	Federal: > 0.030 ppm	N	N	N

ND = No data available
Source: California Air Resources Board and EPA web sites, 2006.

Pollutants

Ozone. Description and Physical Properties: Ozone is what is known as a photochemical pollutant. Ozone is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between reactive organic gases (ROG), NOx, and sunlight. ROG and NOx are emitted from automobiles, solvents and fuel combustion, the sources of which are widespread throughout the air basin. In order to reduce ozone, it is necessary to control emissions of these ozone precursors.[1] Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. A reduction of ozone precursors reduces ozone. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind. The conditions conducive to the formation of ozone include extended periods of daylight (solar radiation) and hot temperatures. These conditions are prevalent during the summer when thermal inversions are most likely to occur. As a result, summertime conditions of long periods of daylight and hot temperatures form ozone in the greatest quantities. During the summer, thermal inversions trap ozone from dispersing vertically, and high concentrations of this pollutant are prevalent.

Health Effects: Health effects of ozone can include the following: respiratory system irritation, reduction of lung capacity, asthma aggravation, inflammation, and damage to lung cells, aggravated cardiovascular disease, and permanent lung damage. The greatest health risk is to those who are more active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Ozone also damages natural ecosystems such as forests and foothill communities, and damages agricultural crops and some man-made materials such as rubber, paint, and plastics.

[1] A precursor is defined as a directly emitted air contaminant that, when released into the atmosphere, forms or causes to be formed or contributes to the formation of a secondary air contaminant for which an Ambient Air Quality Standard has been adopted, or whose presence in the atmosphere will contribute to the violation of one or more Ambient Air Quality Standards.

Sources: Ozone is a secondary pollutant, thus is not emitted directly into the lower level of the atmosphere. The sources of ozone precursors (ROG and NOx) are discussed above in the description of ozone as well as the discussions concerning ROG and NOx in this EIR.

Oxides of Nitrogen. Description and Physical Properties: During combustion of fossil fuels, oxygen reacts with nitrogen to produce NOx (NO, NO_2, NO_3, N_20, N_2O_3, N_20_4, and N_20_5). This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Natural sources of oxides of nitrogen (NOx) include lightning, soils, wildfires, stratospheric intrusion, and the oceans. Natural sources accounted for approximately seven percent of 1990 emissions of NOx for the United States. Atmospheric deposition of NOx occurs when atmospheric or airborne nitrogen is transferred to water, vegetation, soil, or other materials. Acid deposition involves the deposition of nitrogen and/or sulfur acidic compounds that can harm natural resources and materials. NOx is also an ozone precursor. When NOx and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight to form ozone. NOx can also be a precursor to PM_{10} and $PM_{2.5}$.

Health Effects: The EPA has concluded that the only form of NOx that exists at a level high enough to cause public health concerns is nitrogen dioxide (NO_2) (EPA 1997). Nitrogen dioxide is a brown gas with a strong odor. NOx can react with moisture, ammonia, and other compounds to form nitric acid and related particles. The main human health concerns of nitrogen dioxide include lung damage, increased incidence of chronic bronchitis, eye and mucus membrane damage, negative effects on the respiratory system, pulmonary dysfunction, and premature death. Small particles can penetrate deeply into the sensitive tissue of the lungs and can cause or worsen respiratory disease such as emphysema, asthma, and bronchitis, and can also aggravate existing heart disease (EPA *2005b).*

Because NOx is an ozone precursor, the health effects associated with ozone (as discussed above) are also indirect health effects associated with unhealthful levels of NOx emissions.

Sources: The major sources of NO_X include stationary source fuel combustion (i.e., cogeneration, oil and gas production, manufacturing and industrial, food and agricultural processing, and service commercial).

Sulfur Dioxide. Description and Physical Properties: Sulfur dioxide (SO_2) is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfuric acid is formed from sulfur dioxide, which is an aerosol particle component that affects acid deposition. Sulfur oxides (SOx) include sulfur dioxide and sulfur trioxide (SO_3). Anthropogenic, or human caused, sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The California Air Resources Board (CARB), the State regulatory agency charged with regulating air pollution in the State, demonstrates that sulfur dioxide levels in the State are well below the maximum standards (CARB 2006b, Page 107, 408, and 409). Although sulfur dioxide concentrations have been reduced to levels well below State and national standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and PM_{10}. Sulfates are a particulate formed through the photochemical oxidation of sulfur dioxide.

Health Effects: Sulfur dioxide is a soluble gas; therefore, it can be absorbed in the mucous membranes of the respiratory tract and nose. Long-term exposure of high levels of sulfur dioxide can cause irritation of existing cardiovascular disease, respiratory illness, and changes in the defenses in the lungs. When people with asthma are exposed to high levels of sulfur dioxide for short periods of time during moderate activity, effects may include wheezing, chest tightness, or shortness of breath (EPA 2004b).

Sources: The major sources of SOx are stationary source fuel production (CARB 2006).

Lead. Description and Physical Properties: Lead (Pb) is a solid heavy metal that can exist in air pollution as an aerosol particle component. An aerosol is a collection of solid, liquid, or mixed-phase particles suspended in the air. Lead was first regulated as an air pollutant in 1976. Leaded gasoline was first marketed in 1923 and was used in motor vehicles until around 1970. The exclusion of lead from gasoline helped to decrease emissions of lead in the United States from 219,000 to 4,000 short tons per year between 1970 and 1997. Even though leaded gasoline has been phased out in most countries, some still use leaded gasoline. Lead-ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering. The mechanisms by which lead can be removed from the atmosphere (sinks) include deposition to soils, ice caps, and oceans, and inhalation.

Health Effects: Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. The more serious effects of lead poisoning include behavior disorders, mental retardation, and neurological impairment. Low levels of lead in fetuses and young children can result in nervous system damage, which can cause learning deficiencies and low IQs. Lead may also contribute to high blood pressure and heart disease.

Sources: Lead concentrations once exceeded the state and national air quality standards by a wide margin, but have not exceeded state or national air quality standards at any regular monitoring station since 1982. Lead is no longer an additive to normal gasoline, which is the main reason concentration of lead in the air is low.

Particulate Matter (PM_{10} and $PM_{2.5}$). Description and Physical Properties: Particulate matter is a generic term that defines a broad group of chemically and physically different particles (either liquid droplets or solids) that can exist over a wide range of sizes. Examples of atmospheric particles include those produced from combustion (diesel soot or fly ash), light produced (urban haze), sea spray produced (salt particles), and soil-like particles from re-suspended dust. In discussions of air pollution, particulate matter is typically divided up into two size categories: PM_{10} and $PM_{2.5}$ because of the adverse health effects associated with the smaller sized particles. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter, also known as micrometer [µm]). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter. Soil dust consists of the minerals and organic material found in soil being lifted up into the air by winds. Fugitive dust is defined as any solid particulate matter entrained in the ambient air which is caused by anthropogenic or natural activities which is emitted into the air without first passing through a stack or duct designed to control flow, including, but not limited to, emissions caused by movement of soil, vehicles, equipment, and windblown dust.

Health Effects: Particulate matter can be inhaled directly into the lungs where it can be absorbed into the bloodstream. It is a respiratory irritant and can cause direct pulmonary effects such as coughing, bronchitis, lung disease, respiratory illnesses, increased airway reactivity, and exacerbation of asthma. Particulate matter is also thought to have direct effects on the heart. Relatively recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health effects include reduced visibility and soiling of property.

Sources: Particulate matter originates from a variety of stationary and mobile sources. Stationary sources include: fuel combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; mining and processing of metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal and recycling. Mobile or transportation-related sources include particulate matter from highway vehicles and off-road vehicles and fugitive dust from paved and unpaved roads.

Diesel Particulate Matter. Description and Physical Properties: Diesel particulate matter (DPM) is a source of $PM_{2.5}$ because the size of diesel particles is typically *2.5* microns and smaller. In 1998, DPM made up about 6 percent of the total $PM_{2.5}$ inventory nationwide (EPA 2002). Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. DPM is a concern because many compounds found in diesel exhaust are carcinogenic, including 16 that are classified as possibly carcinogenic by the International Agency for Research on Cancer. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerating, decelerating), fuel formulations (high/low sulfur fuel), and the year in which the engine was manufactured (EPA 2002).

Health Effects: Some short-term (acute) effects of diesel exhaust include eye, nose, throat and lung irritation, coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of ambient particulate matter pollution as well, and numerous studies have linked elevated particle levels in the air to increased hospital admission, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems (OEHHA 2002).

Sources: The main sources of DPM are mobile emissions from trucks on area roadways, trains and other machinery and process that utilize diesel as a fuel.

Visibility Reducing Particles. Description and Physical Properties: Visibility reducing particles (VRPs) are suspended particulate matter that reduces visibility. Visibility is the distance through the air that can be seen without the use of instrumental assistance. The distance that can be seen is limited by the amount of gases and aerosol particles in the way. Looking up vertically into the sky, one can see a greater distance compared with looking across the horizon because there are fewer particles blocking the view. Without pollution effects in the western United States, a natural visual range is 140 miles, and in the eastern United States, the range would be 90 miles (EPA 1999). In 1999, the visibility range in the West was 33–90 miles and in the East 14-24 miles (EPA 1999). The EPA implemented a Regional Haze Rule in 1999 to attempt to protect visibility in 156 national parks and wilderness areas in the United States. The regulation requires States to establish goals for improving their areas and work together with other States as the pollution is often transported over long distances (EPA 1999).

Health Effects: VRPs are generally considered the “soup” known as air pollution; the human health effects of VRPs are those of the pollutants (particulate matter, oxides of nitrogen, and sulfur dioxide) discussed above.

Sources: Again, because VRPs are generally considered the “soup” of air pollutants, the sources are other pollutants as discussed above.

Reactive Organic Gases. Description and Physical Properties: Reactive organic gases (ROG), or volatile organic compounds (VOCs), are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. ROG consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon, methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

It should be noted that there are no state or national ambient air quality standard for ROG because they are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROG are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.

Health Effects: Although health-based standards have not been established for ROG, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of ROG are suspected to cause eye, nose, and throat irritation; headaches, loss of coordination, nausea, damage to liver, kidney, and the central nervous system (EPA 2005). There are many ROG that have been classified as toxic air contaminants. A particular ROG of concern is benzene, which is described in more detail below. EPA maintains a list of all air substances that have been classified as hazardous to humans and/or animals, and include VOCs, pesticides, herbicides, and radionuclides (EPA 2006d).

Global Climate Change

History. In 1988, the United Nations established the Intergovernmental Panel on Climate Change (“IPCC”) to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change from increased levels of atmospheric greenhouse gases (GHG) as a result of human activities, most notably the burning of fossil fuels for transportation and electricity generation. In 1992, the United States joined other countries around the world in signing the United Nations Framework Convention on Climate Change (“UNFCCC”) Agreement with the goal of controlling greenhouse gas (GHG) emissions. GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride.As a result, the Climate Change Action Plan was developed to address the reduction of greenhouse gases in the United States. The Plan consists of more than 50 voluntary programs.

Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere – chlorofluorocarbons ("CFC's"), hallons, carbon tetrachloride, methyl chloroform – were to be phased out by 2000 (2005 for methyl chloroform).

California Code of Regulations Title 24, Part 6, enacted in 1978, established energy efficiency standards for residential and nonresidential buildings in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and incorporation of new energy efficiency technologies and methods. The latest amendments occurred in October 2005.

The science of global climate change is evolving and remains subject to extensive debate and uncertainties. The latest report of the Intergovernmental Panel on Climate Change (IPCG)—an international group of scientists and representatives of 113 governments—released February 2, 2007,[1] concludes "The widespread warming of the atmosphere and ocean, together with ice-mass loss, support the conclusion that it is extremely unlikely that global climate change of the past 50 years can be explained without external forcing, and very likely that it is not due to known natural causes alone."

According to the 2006 California Climate Action Team Report,[2] the following climate change effects, which are based on the IPCG trends, can be expected in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, threatening the state's water supply;
- Increasing temperatures from 8 to 10.4 degrees Fahrenheit under the higher emission scenarios, leading to a 25 percent to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas;
- Increased vulnerability of forests due to pest infestation and increased temperatures; and
- Increased electricity demand, particularly in the hot summer months.

Currently, the United States EPA does not regulate greenhouse gas pollutants resulting from motor vehicle emissions, those pollutants that could contribute significantly to global warming. However, recently the United States Supreme Court in the case of *Massachusetts v. The Environmental Protection Agency*, the Supreme Court held that the EPA had a mandatory duty to enact rules regulating mobile emissions of greenhouse gas pursuant to the Federal Clean Air Act. The Court held that greenhouse gases do fit the definition of an air pollutant which causes and contributes to air pollution which may reasonably be anticipated to endanger public health or welfare. Accordingly, it appears that in the near future, the United States Federal Government through the EPA will promulgate regulations pertaining to emissions of greenhouse gases under the authority of the Federal Clean Air Act.

1 Intergovernmental Panel on Climate Change, Working Group I: The Physical Basis of Climate Change, http://ipcc-wg1.ucar.edu/wg1/wg1-report.html, website accessed July 2, 2007.

2 California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, March 2006.

Although the Federal Government has not regulated emissions of greenhouse gases, the State of California has been proactive in studying the impacts of climate change. The following are summaries of the pertinent State legislation dealing with global climate change.

Assembly Bill 4420 (AB 4420). The State of California has been studying the impacts of climate change since 1988, when AB 4420 was approved. This legislation directed the California Energy Commission, in consultation with the Air Resources Board and other agencies, to study the implications of global warming on California's environment, economy, and water supply. The Energy Commission was also directed to prepare and maintain the state's inventory of greenhouse gas emissions. That bill directed the ARB to adopt regulations to achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles. ARB staff's proposal implementing these regulations was approved by the Air Resources Board in September, 2004. With implementation, the average reduction of greenhouse gases from new California cars and light trucks will be about 22 percent in 2012 and about 30 percent in 2016, compared to today's vehicles (ARB 2005b, 2006).

Assembly Bill 1493 (AB 1493). California Assembly Bill 1493 Vehicular Emissions: Greenhouse Gases, signed into law on July 22, 2002, required that the ARB develop and adopt regulations that achieve the maximum feasible and cost effective reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks. In response, CARB adopted landmark regulations in 2004 limiting greenhouse gas emissions from new vehicles sold in California beginning in the 2009 model year. New vehicles complying with this regulation will consume 30 percent less fuel than vehicles built prior to 2009. Assuming these regulations are not overturned in the courts, they could result in significant reductions in the demand for transportation fuel in California.

Assembly Bill 32 (AB 32). Most recently, California adopted AB32, the Global Warming Solutions Act of 2006. AB 32 codifies the state's goal by requiring that the state's global warming emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012. In order to effectively implement the cap, AB 32 directs ARB to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.

While neither the Appendix G Guidelines, nor any judicial decision or CEQA regulation or statute require an EIR to address a project's impact on greenhouse gases, consistent with the public policy rationale underlying AB 32, this EIR does in fact fully analyze the project's impacts on greenhouse gas emissions. As defined under AB 32, greenhouse gas emissions include the following: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride.

Global Warming Potential. Greenhouse gases have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (EPA 20061). One teragram of carbon dioxide equivalent (Tg CO2 Eq.) is essentially the emissions of the gas multiplied by the GWP. One teragram is equal to one million metric tons. The carbon dioxide equivalent is a good way to assess emissions because it gives weight to the GWP of the gas. A summary of the atmospheric lifetime and GWP of selected gases is summarized in Table ~~5.7-5~~4.3.B. As shown in the table, GWP ranges from 1 to 23,900.

Table 4.3.B – Atmospheric Lifetime and Global Warming Potential for Greenhouse Gases

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide	50-200	1
Methane	12 ± 3	21
Nitrous Oxide	120	310
HFC-23	264	11700
HFC-134a	14.6	1300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF_4)	50000	6500
PFC: Hexafluoromethane (C_2F_6)	10000	9200
Sulfur Hexafluoride (SF_6)	3200	23900

Source: EPA 2006k

Inventory. An analysis of data compiled by the United Nations Framework Convention on Climate Change (UNFCCC), indicates that in 2004, total GHG emissions were 20,135 Tg CO_2 Eq., excluding emissions/removals from land use, land use change, and forestry (UNFCC 2006). In 2004, the U.S. contributed the most GHG emissions (35% of global emissions). In 2004, in the U.S., total GHG emissions were 7074.4 Tg CO_2 Eq., which is an increase of 15.8 percent from 1990 emissions (EPA 2006).

California is a substantial contributor of global greenhouse gases as it is the second largest contributor in the U.S. and the sixteenth largest in the world (CEC 2006). During 1990 to 2003, California's gross state product grew 83 percent while GHG emissions grew 12 percent. While California has a high amount of GHG emissions, it has low emissions per capita. In 2004, California produced 492 Tg CO_2 Eq. (CEC 2006), which is approximately seven percent of U.S. emissions. The major source of GHG in California is transportation, contributing 41 percent of the state's total GHG emissions (CEC 2006). Electricity generation is the second largest generator, contributing 22 percent of the state's GHG emissions.

Emissions from fuel use in the commercial and residential sectors in California decreased 9.7 percent over the 1990 to 2004 period (CEC 2006). The decrease in greenhouse gases could demonstrate the effectiveness of energy conservation in buildings (Title 24 requirements) and appliances. The decrease in greenhouse gases attributed to these sources is even more substantial when the population increase in California is considered.

Health Effects. Health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems. Heat related problems include heat rash and heat stroke. In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative consequences. Global warming may also contribute to air quality problems from increased frequency of smog and particulate air pollution (EPA 2006).

Water Vapor. Description and Physical Properties: Water vapor (H_2O) is the most abundant, important, and variable greenhouse gas in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization (EPA 2006). The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a greenhouse gas, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there are also dynamics that put the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

Health Effects: There are no health effects from water vapor. When some pollutants come in contact with water vapor, they can dissolve and then the water vapor can be a transport mechanism to enter the human body.

Sources: The main source of water vapor is evaporation from the oceans (approximately 85%). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.

Carbon Dioxide. Description and Physical Properties: Carbon dioxide ($C0_2$) is an odorless, colorless natural greenhouse gas.

Health Effects: Outdoor levels of carbon dioxide are not high enough to result in negative health effects.

Sources: Carbon dioxide is emitted from natural and anthropocentric (human) sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out gassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid 1700's, the human caused activities have increased in scale and distribution. Over the past 50 years, data has shown that concentrations of carbon dioxide are increasing. Prior to the industrial revolution, concentrations were fairly stable at 280 ppm. Today, they are around 370 ppm, an increase of over 30 percent (EPA 2006). Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (IPCC 2001). Some predict that this will result in an average global temperature rise of at least 2° Celsius (IPPCC 2001).

Sinks: Sinks are mechanisms by which a gas or aerosol is taken out of the atmosphere. Carbon dioxide is removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks.

Methane. Description and Physical Properties: Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to other greenhouse gases.

Health Effects: There are no health effects from methane.

Sources: Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane (EPA 2006). Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide. Description and Physical Properties: Nitrous oxide (N_2O), also known as laughing gas, is a colorless greenhouse gas.

Health Effects: Nitrous oxide can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses it is harmless. In some cases, heavy and extended use can cause Olney's Lesions (brain damage).

Sources: Concentrations of nitrous oxide also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 ppb. Nitrous oxide is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load (EPA 2006). It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars.

Sinks: Nitrous oxide can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction.

Chlorofluorocarbons. Description and Physical Properties: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface).

Health Effects: CFCs are no longer being used; nonetheless, in confirmed indoor locations, working with CFC- 113 or other CFCs is thought to have resulted in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation (NTOSH 1989).

Sources: CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining level or declining. However, their long atmospheric lifetimes mean that some of the CECs will remain in the atmosphere for over 100 years (NOAA 2005).

Hydrofluorocarbons. Description and Physical Properties: Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs. Out of all the greenhouse gases, they are one of three groups with the highest global warming potential. The HPCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2) (EPA 2006). Prior to 1990, the only significant emissions were HFC-23. HFC-134a use is increasing due to its use as a refrigerant. Concentrations of HFC-23 and HFC-134a are now about 10 parts per trillion [ppt]) each (EPA 2006). Concentrations of HFC-152a are about 1 ppt.

Health Effects: None.

Sources: HFCs are man made for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons. Description and Physical Properties: Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). Concentrations of CF_4 in the atmosphere are over 70 ppt (EPA 2006).

Health Effects: None.

Sources: The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur Hexafluoride. Description and Physical Properties: Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated, 23,900. Concentrations in the 1990's were about 4 ppt (EPA 2006).

Health Effects: In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.

Sources: Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Aerosols. Description and Physical Properties: Aerosols are particles emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols.

Health Effects: Refer to health effects of particulate matter above.

Sources: Sulfate aerosols are emitted when fuel containing sulfur is burned. Another source of aerosols (in the form of black carbon or soot) is the result of incomplete combustion or the incomplete burning of fossil fuels. Although particulate matter regulation has been lowering aerosol concentrations in the United States, global concentrations are likely increasing as a result of other sources around the world.

4.3.2 Existing Policies and Regulations

Federal Regulations. Pursuant to the Federal CAA of 1970, the U.S. Environmental Protection Agency (EPA) established national ambient air quality standards (NAAQS). The NAAQS were established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

The NAAQS are two-tiered: primary, to protect public health; and secondary, to prevent degradation of the environment (e.g., impairment of visibility, damage to vegetation and property, etc.). The six criteria pollutants are ozone (O_3), carbon monoxide (CO), particulates less than ten microns (PM_{10}), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). The primary standards for these pollutants are shown in Table 4.3.C ~~Table 4.3.B~~ and the health effects from exposure to the criteria pollutants are described in Table 4.3.D ~~Table 4.3.C~~.

Table 4.3.C ~~4.3.B~~ – Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[A]		Federal Standards[B]		
		Concentration[C]	Method[D]	Primary[C,E]	Secondary[C,F]	Method[G]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (157 µg/m^3)		0.08 ppm (157 µg/m^3)[H]		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		50 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—

Table 4.3.C ~~4.3.B~~ – Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[A]		Federal Standards[B]		
		Concentration[C]	Method[D]	Primary[C,E]	Secondary[C,F]	Method[G]
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.25 ppm (470 µg/m^3)		—		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	—	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	—	
	3-Hour	—		—	0.5 ppm (1,300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		—	—	
Lead[I] (Pb)	30-Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70%. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[I]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: California Air Resources Board (May 2006).

Table 4.3.C ~~4.3.B~~ Notes

A California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1 and 24 hour); nitrogen dioxide; suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles—are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

B National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations,

Table 4.3.C ~~4.3.B~~ Notes

averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

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

D Any equivalent procedure that can be shown to the satisfaction of the California Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

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

F National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

G Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

H New federal eight-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18, 1997. Contact U.S. EPA for further clarification and current federal policies.

I The California Air Resources Board 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.

Table 4.3.D ~~4.3.C~~ – Summary of Health Effects of the Major Criteria Air Pollutants

Pollutants	Sources	Primary Effects
Ozone (O_3)	Atmospheric reaction of organic gases with nitrogen oxides in the presence of sunlight.	Aggravation of respiratory and cardiovascular diseases. Irritation of eyes. Impairment of cardiopulmonary function. Plant leaf injury.
Nitrogen Dioxide (NO_2)	Motor vehicle exhaust. High temperature stationary combustion. Atmospheric reactions.	Aggravation of respiratory illness. Reduced visibility. Reduced plant growth. Formation of acid rain.
Carbon Monoxide (CO)	Byproducts from incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. Natural events, such as decomposition of organic matter.	Reduced tolerance for exercise. Impairment of mental function. Impairment of fetal development. Death at high levels of exposure. Aggravation of some heart diseases (angina).

Table 4.3.D ~~4.3.C~~ – Summary of Health Effects of the Major Criteria Air Pollutants

Pollutants	Sources	Primary Effects
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	Stationary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Reduced lung function. Aggravation of the effects of gaseous pollutants. Aggravation of respiratory and cardiorespiratory diseases. Increased cough and chest discomfort. Soiling. Reduced visibility.
Sulfur Dioxide (SO_2)	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	Aggravation of respiratory diseases (asthma, emphysema). Reduced lung function. Irritation of eyes. Reduced visibility. Plant injury. Deterioration of metals, textiles, leather, finishes, coatings, etc.
Lead (Pb)	Contaminated soil (e.g., from leaded fuels and lead-based paints).	Impairment of blood function and nerve construction. Behavioral and hearing problems in children.

Source: California Air Resources Board 2001.

In July 1997, the EPA adopted new standards for eight-hour ozone and particulates less than 2.5 microns in diameter ($PM_{2.5}$). In 2001, the U.S. Supreme Court, while upholding the manner national air quality standards are developed, threw out the EPA's policy for implementing new ozone rules, saying that the agency ignored a section of the law that restricts its authority to enforce such rules. In April 2003, the EPA was cleared to implement the eight-hour ground-level ozone standard. The EPA issued the proposed rule implementing the eight-hour ozone standard in April 2003 and issued the final eight-hour ozone nonattainment designations/boundaries on April 15, 2004. The eight-hour ozone implementation rule revokes the one-hour standard in April 2005. The EPA issued a final $PM_{2.5}$ implementation rule in September 2004 and made a final designation on December 15, 2004.

Data collected at permanent monitoring stations are used by the EPA to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. States will be provided three years, to April 2007, to develop eight-hour ozone State Implementation Plans (SIPs). States will need to demonstrate conformity by April 15, 2005, in eight-hour ozone nonattainment areas, given the one-year grace period following the final designations. Various areas in the State of California have different attainment dates based on their corresponding classification.

The MDAB was designated as "severe" for the one-hour ozone standard, requiring attainment of the federal ozone standard by 2007; "serious" for CO, requiring attainment of federal CO standards by 2000; and "serious" for PM_{10}, requiring attainment of federal standards by 2001. The EPA has designated the Southern California Association of Governments (SCAG) as the Metropolitan Planning Organization (MPO) responsible for ensuring compliance with the requirements of the CAA. As stated above, the region is currently designated as "nonattainment" under State and federal ozone ambient air quality standards and also under PM_{10} ambient air quality standards.

State Regulations. The State of California began to set California Ambient Air Quality Standards (CAAQS) in 1969, under the mandate of the Mulford-Carrell Act. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are listed in previously referenced Table 4.3.C ~~Table 4.3.B~~.

Originally, there were no attainment deadlines for the CAAQS; however, the California Clean Air Act (CCAA) of 1988 provided a time frame and a planning structure to promote their attainment. The CCAA required nonattainment areas in the State to prepare attainment plans, and proposed to classify each such area on the basis of the submitted plan, as follows: moderate, if CAAQS attainment could not occur before December 31, 1994; serious, if CAAQS attainment could not occur before December 31, 1997; and severe, if CAAQS attainment could not be conclusively demonstrated at all.

The attainment plans are required to achieve a minimum 5 percent annual reduction in the emissions of nonattainment pollutants unless all feasible measures have been implemented. The attainment status of the Basin is shown in Table 4.3.E ~~Table 4.3.D~~.

Table 4.3.E ~~4.3.D~~ – Mojave Desert Air Basin Attainment Status

Criteria Pollutant	Federal Designation	State Designation
One-hour Ozone (O_3)	No Status: Standard Revoked	Nonattainment: Moderate
Eight-hour Ozone (O_3)	Moderate (2010)	No Standard
Carbon Monoxide (CO)	Attainment	Attainment
PM_{10}	Nonattainment: Moderate	Nonattainment
$PM_{2.5}$	Unclassified	No Standard
Nitrogen Dioxide (NO_2)	Attainment	Attainment

Source: MDAQMD, August 2006.

Regional Regulations

Regional Air Quality Planning Framework. The 1976 Lewis Air Quality Management Act established the regional air districts throughout the State. The MDAQMD, an autonomous air quality control agency replacing the former San Bernardino County Air Pollution Control District (SBCAPCD), was created in July 1993. The CAA Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the State.

The ARB coordinates and oversees both State and federal air pollution control programs in California. ARB oversees activities of local air quality management agencies and is responsible for incorporating air quality management plans for local air basins into an SIP for federal approval. ARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by ARB to classify air basins as "attainment" or "nonattainment" with respect to each pollutant, and to monitor progress in attaining air quality standards. ARB has divided the State into 15 air basins. Significant authority for air quality control within them has been given to local air districts that regulate stationary source emissions and develop local nonattainment plans. The CCAA provides the MDAQMD with the authority to manage transportation activities at indirect sources and to regulate stationary source emissions. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution. An example of this would be the motor vehicles at an intersection, a mall, and on highways. As a State agency, ARB regulates motor vehicles and fuels for their emissions.

Regional Air Quality Management Plan. The MDAQMD and SCAG are responsible for formulating and implementing the air quality attainment plan for the MDAB. Regional air quality attainment plans were adopted in 1991, 1994, and 1997. The following are the currently approved plans for the MDAB region:

- 1997 State Implementation Plan (SIP) for ozone, PM_{10}, and nitrogen dioxides.
- 1995 Mojave Desert Planning Area Federal PM_{10} Attainment Plan.

The MDAQMD completed a Draft MDAQMD 2004 Ozone Attainment Plan (State and federal) in February 2004.

Local Regulations

Town of Yucca Valley Comprehensive General Plan Policies. The Town of Yucca Valley Comprehensive General Plan defines goals and policies related to air quality within Yucca Valley. The specific policies of the General Plan that are relevant to the proposed project are as follows:

Air Quality Element

Policy 6 All development proposals brought before the Town will be reviewed for potential adverse effects on air quality and will be required to mitigate any significant impacts.

4.3.3 Thresholds of Significance

Specific criteria for determining whether the potential air quality impacts of a project are significant are set forth in the MDAQMD's CEQA and Federal Conformity Guidelines (July 2006). The criteria include emissions thresholds, compliance with State and national air quality standards, and consistency with the current air quality plans.

The following significance thresholds for direct and indirect impacts have been established by the MDAQMD:

- 25 tons per year or 137 pounds per day of reactive organic compounds (ROC);
- 25 tons per year or 137 pounds per day of NOx;

- 100 tons per year or 548 pounds per day of CO;
- 15 tons per year or 82 pounds per day of $PM_{10;}$ and
- 25 tons per year or 137 pounds per day of SOx.

Projects in the MDAQMD with construction-related emissions that exceed any of the emission thresholds above are considered significant.

Air Pollutant Standards for CO with Localized Effects. Project emissions of CO with localized effects are considered significant if they exceed the following thresholds.

- California State one-hour CO standard of 20.0 ppm.
- California State eight-hour CO standard of 9.0 ppm.

The significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. When ambient levels are below the standards without the project emissions, a project is considered to have significant impacts if project emissions result in an exceedance of one or more of these standards.

Diesel Exhaust Health Risk Thresholds. Project emissions of diesel exhaust from idling trucks are considered significant if they exceed the following thresholds:

- Creation of a carcinogenic health risk of 10 in a million; and/or
- Creation of a chronic (non-carcinogenic) health risk of 1.0 in a million;

Additionally, according to CEQA Guidelines, Appendix G, the proposed project would result in a significant air quality impact if the project would:

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

Methodology. The proposed project is located within the jurisdiction of the MDAQMD; the emission thresholds established by the MDAQMD were utilized in the assessment of potential air quality impacts that may result from the development of the proposed project.

Air pollutant emissions associated with the project would occur over the short term from construction activities, such as fugitive dust from site preparation and grading, and emissions from equipment exhaust. There would be long-term regional emissions associated with project-related vehicle trips. Long-term stationary source emissions would occur due to energy consumption such as electricity usage by the proposed land uses.

The air quality assessment included in Appendix B estimates emissions associated with short-term construction and long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by vehicular trips off site. In addition, localized air quality impacts (i.e., higher CO concentrations [CO hot spots]) near intersections or roadway segments in the project vicinity could potentially result from project-related vehicle and truck trips.

CO concentrations were predicted for the existing, 2007 (opening year) no project, 2007 (opening year) plus project, 2030 (build out year) no project, and 2030 (build out year) plus project scenarios, based on traffic data provided in the traffic study (LSA, August, 2006) prepared for the proposed project. CALINE4, the fourth generation California Line Source Dispersion Model developed by the California Department of Transportation (Caltrans), was used. Input data for this model include meteorology, street network geometrics, traffic information, and emission generation rates. Meteorological data required include temperature, sigma theta (standard deviation of wind direction change), wind direction, and wind speed. Street network geometrics require use of an x-y coordinate system onto which the modeled roadway can be overlaid in order to identify the relative locations of the traffic lane(s) and nearby receptor(s). Required traffic information included peak-hour traffic volumes, speed limit, level of service, and signal cycle times. Emission factors were calculated using the ARB EMFAC 2002 emission factors.

Output from the model includes one-hour CO concentrations in parts per million (ppm) at selected receptor locations. To reflect total concentrations, the ambient CO concentration of the vicinity must be added to the CO concentration predicted by CALINE4. Based on the methodology suggested by the EPA and included in Caltrans CO Protocol (December 1997), the existing ambient concentration was determined as the higher of the second highest annual one-hour and annual eight-hour observation at the nearest representative monitoring station over the past two years. Ambient concentrations for 2007 with and without the project and 2030 with and without the project are assumed to be the same as the existing levels for the worst-case scenario. The predicted CALINE4 concentration is calculated for the one-hour averaging time. The one-hour CO concentrations predicted by CALINE4 were multiplied by a persistence factor of 0.7 to determine the predicted eight-hour CO concentrations.

Regional emissions were calculated from motor vehicles. Predictions for air pollutant emissions generated by the project traffic were calculated with the URBEMIS 2002 model, based on the trip generations projected for the project from the traffic study. Emissions from stationary sources such as natural gas usage were also calculated with URBEMIS 2002.

Long-term diesel exhaust health risk assessment impacts are those associated with project-related truck deliveries to the proposed project site. Impacts on human health caused by project diesel-powered trucks performing deliveries to the project site were assessed as follows. Diesel truck delivery emissions were characterized by estimating the number of deliveries by truck type (2-axle light and medium delivery trucks; or heavy-duty semi-trailer and fuel tanker trucks). The idling times of the trucks were next estimated. Nearby sensitive receptors were then located and a screening level of analysis conducted using the SCREEN3 air dispersion model. Multiple screening scenarios were performed at a range of distances to assess varying distances to residences. The simpler screening analysis predicts concentrations at the nearby receptor assuming wind direction directly from the delivery area to the residence, resulting in a conservative (over estimation) estimate of carcinogenic and chronic inhalation health risks at the selected distances.

Global Climate Change (Green House Gas Emissions) Thresholds. Based on the lack of a threshold for analyzing the significance of project level impacts associated with GHG emissions, it is not possible to develop a quantifiable emissions threshold. Furthermore, it is reasonable to conclude that an individual development project cannot generate a high enough quantity of GHG emissions to affect global climate change. However, individual projects incrementally contribute towards the potential for global climate change on a cumulative basis in concert with all other past, present and reasonably foreseeable project.

Because of the lack of a project specific impact on global climate change resulting from any development project and the lack of a quantifiable emissions threshold, cumulative impact assessment has been conducted based on the following methodology:

- Calculation of GHG emissions. The purpose of this step is for informational purposes, as there is no quantifiable GHG emissions threshold.

- Compliance/Compatibility with GHG Emission Reduction Strategies. The purpose of this step is to assess the project's compliance or compatibility with the GHG emission reduction strategies contained in the California Climate Action Team's (CAT's) Report to the Governor. If a project is compatible or consistent with the applicable CAT strategies, then the projects cumulative impact on global climate change is considered less than significant.

4.3.4 Impacts and Mitigation

Less Than Significant Impacts. The following impacts were determined to be less than significant. In each of the following issues, either no impact would occur (and therefore, no mitigation would be required) or adherence to established regulations, standards, and policies would reduce potential impacts to a less than significant level.

Air Quality Management Plan.

Threshold	Would the proposed project conflict with or obstruct implementation of the applicable air quality plan?

The Town of Yucca Valley is located within the Mojave Desert Air Basin. Air pollution from stationary sources within the Town of Yucca Valley is regulated by the MDAQMD. Ambient air quality is administered by MDAQMD's AQMP. The AQMP incorporates local General Plan land use assumptions and regional growth projections developed by SCAG to estimate stationary and mobile source emissions associated with projected population and planned land uses. If the new land use is consistent with the local General Plan and the regional growth projections adopted in the AQMP, then the added emissions generated by the new project have already been evaluated in the AQMP in formulating the emissions reductions strategies. Because the proposed project is consistent with the Town's General Plan and zoning designation, it would not conflict or obstruct implementation of any of the control measures in the AQMP. Accordingly, impacts associated with this issue are less than significant.

Long-Term Microscale (CO Hotspot) Impacts to Sensitive Receptors.

Threshold	Would the proposed project expose sensitive receptors to substantial pollutant concentrations?

Vehicular trips associated with the proposed project would contribute to congestion at intersections and along roadway segments in the project vicinity. Localized air quality effects would occur when emissions from vehicular traffic increase in local areas as a result of the proposed project. The primary mobile source pollutant of local concern is CO, which is a direct function of vehicle idling time and thus, traffic flow conditions. CO transport is extremely limited; it disperses rapidly with distance from the source under normal meteorological conditions; however, under certain extreme meteorological conditions, CO concentrations proximate to a congested roadway or intersection may reach unhealthful levels. Particular emphasis is given to local sensitive receptors (residents, school children, the elderly, hospital patients, etc) as these sensitive groups may experience health effects and are more likely to be affected at lower levels of CO than the general public. Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentration, modeling is recommended to determine a project's effect on local CO levels.

The intersection vehicle turn volumes were used in Caltrans CALINE4 model to evaluate local CO concentrations at intersections most affected by project traffic. The CALINE4 model outputs are included in Appendix A of the Air Quality Study. The CO concentrations for the Victorville station (3.2 ppm for the one-hour period and 1.9 ppm for the eight-hour period) were used as the background levels for existing, 2007 with and without project, and 2030 with and without project. Tables 4.3.F ~~4.3.E~~ through 4.3.H ~~4.3.G~~ identify the CO concentrations for the existing, 2007, and 2030 conditions at 22 intersections in the project area. The proposed project would contribute to increased CO concentrations at intersections in the project vicinity.

Table 4.3.F ~~4.3.E~~ – Existing Carbon Monoxide Concentrations[1]

Intersection	Receptor Distance to Road Centerline (Meters)	Existing One-Hour CO Concentration (ppm)	Existing Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
				1-Hr	8-Hr
Inca Trail and State Route 62	7	6.9	3.8	No	No
	7	6.9	3.8	No	No
	7	6.8	3.8	No	No
	7	6.8	3.8	No	No

Table 4.3.F ~~4.3.E~~ – Existing Carbon Monoxide Concentrations[1]

Intersection	Receptor Distance to Road Centerline (Meters)	Existing One-Hour CO Concentration (ppm)	Existing Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
				1-Hr	8-Hr
Pioneertown Road and State Route 62	8	7.3	4.1	No	No
	8	7.1	4.0	No	No
	8	7.0	3.9	No	No
	8	6.8	3.8	No	No
Sage Avenue and State Route 62/Yucca Trail	14	7.9	4.5	No	No
	14	7.7	4.4	No	No
	14	7.5	4.2	No	No
	14	6.8	3.8	No	No
State Route 247 and Aberdeen Drive	14	4.2	1.9	No	No
	14	4.2	1.9	No	No
	14	4.2	1.9	No	No
	14	4.1	1.9	No	No
State Route 247 and Buena Vista Drive	8	5.0	2.5	No	No
	8	4.9	2.4	No	No
	8	4.9	2.4	No	No
	8	4.7	2.3	No	No
State Route 247 and State Route 62	14	7.2	4.0	No	No
	14	7.0	3.9	No	No
	14	7.0	3.9	No	No
	14	6.8	3.8	No	No
Joshua Lane and Yucca Trail	14	5.1	2.6	No	No
	14	5.0	2.5	No	No
	14	4.9	2.4	No	No
	14	4.9	2.4	No	No
Joshua Lane and Onaga Trail	14	4.4	2.1	No	No
	12	4.4	2.1	No	No
	12	4.3	2.0	No	No
	12	4.3	2.0	No	No
Balsa Avenue and State Route 62	12	6.1	3.3	No	No
	10	6.1	3.3	No	No
	10	6.0	3.2	No	No
	10	6.0	3.2	No	No

Table 4.3.F ~~4.3.E~~ – Existing Carbon Monoxide Concentrations[1]

Intersection	Receptor Distance to Road Centerline (Meters)	Existing One-Hour CO Concentration (ppm)	Existing Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
				1-Hr	8-Hr
Avalon Avenue and State Route 62	8	6.3	3.4	No	No
	8	6.2	3.3	No	No
	8	6.2	3.3	No	No
	8	6.0	3.2	No	No
Avalon Avenue and Project Driveway	12	3.8	1.7	No	No
	12	3.8	1.7	No	No
	8	3.8	1.7	No	No
	7	3.7	1.6	No	No
Avalon Avenue and Palisades Drive	15	3.7	1.6	No	No
	15	3.7	1.6	No	No
	14	3.7	1.6	No	No
	14	3.7	1.6	No	No
Avalon Avenue and Yucca Trail	8	4.9	2.4	No	No
	8	4.9	2.4	No	No
	8	4.8	2.4	No	No
	8	4.8	2.4	No	No
Palomar Avenue and Joshua Lane	14	3.6	1.5	No	No
	14	3.6	1.5	No	No
	14	3.6	1.5	No	No
	14	3.6	1.5	No	No
Project Driveway and State Route 62	12	6.5	3.5	No	No
	8	6.3	3.4	No	No
	8	6.0	3.2	No	No
	8	6.0	3.2	No	No
Yucca Mesa Road and Buena Vista Drive	12	4.1	1.9	No	No
	8	4.0	1.8	No	No
	8	4.0	1.8	No	No
	8	4.0	1.8	No	No
Yucca Mesa Road and State Route 62	21	5.4	2.8	No	No
	21	5.2	2.6	No	No
	19	5.2	2.6	No	No
	19	5.2	2.6	No	No

Table 4.3.F ~~4.3.E~~ – Existing Carbon Monoxide Concentrations[1]

Intersection	Receptor Distance to Road Centerline (Meters)	Existing One-Hour CO Concentration (ppm)	Existing Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
				1-Hr	8-Hr
Contenta Road and Yucca Trail	8	4.4	2.1	No	No
	8	4.4	2.1	No	No
	8	4.3	2.0	No	No
	8	4.3	2.0	No	No
Sunny Vista Road and Alta Loma Road	10	3.9	1.7	No	No
	10	3.9	1.7	No	No
	10	3.9	1.7	No	No
	10	3.9	1.7	No	No
Park Boulevard and State Route 62	7	6.7	3.7	No	No
	7	6.7	3.7	No	No
	7	6.6	3.6	No	No
	7	6.6	3.6	No	No
Park Boulevard and Alta Loma Road	2	4.1	1.9	No	No
	2	4.1	1.9	No	No
	2	4.1	1.9	No	No
	2	4.1	1.9	No	No
Project Access and State Route 62	2	8.4	4.9	No	No
	2	8.4	4.9	No	No
	2	8.3	4.8	No	No
	2	8.3	4.8	No	No

1 Includes ambient one-hour concentration of 3.1 ppm and ambient eight-hour concentration of 1.1 ppm. Measured at the Fs-590 Racquet Club Avenue, Palm Springs, California, Air Quality Station (Riverside County).
2 State one-hour CO standard is 20 ppm and eight-hour standard is 9.0 ppm.
Source: LSA Associates, Inc., August 2006.

Table 4.3.G ~~4.3.F~~ – 2007 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Inca Trail and State Route 62	8 / 8	0.5 / 0.4	7.0 / 7.5	3.8 / 4.2	No	No
	8 / 8	0.5 / 0.4	7.0 / 7.5	3.8 / 4.2	No	No
	7 / 7	0.4 / 0.2	6.9 / 7.3	3.8 / 4.0	No	No
	7 / 7	0.4 / 0.2	6.9 / 7.3	3.8 / 4.0	No	No

Table 4.3.G ~~4.3.F~~ – 2007 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Pioneertown Road and State Route 62	8 / 8	0.2 / 0.1	7.9 / 8.1	4.5 / 4.6	No	No
	8 / 8	0.1 / 0.1	7.5 / 7.6	4.2 / 4.3	No	No
	8 / 8	0.3 / 0.2	7.2 / 7.5	4.0 / 4.2	No	No
	8 / 8	0.2 / 0.1	7.2 / 7.4	4.0 / 4.1	No	No
Sage Avenue and State Route 62/Yucca Trail	17 / 17	0.3 / 0.2	8.4 / 8.7	4.8 / 5.0	No	No
	17 / 17	0.2 / 0.2	8.3 / 8.5	4.7 / 4.9	No	No
	17 / 17	0.2 / 0.2	8.0 / 8.2	4.5 / 4.7	No	No
	14 / 14	0.2 / 0.1	7.1 / 7.3	3.9 / 4.0	No	No
State Route 247 and Aberdeen Drive	14 / 14	0.1 / 0.0	4.2 / 4.3	1.9 / 1.9	No	No
	14 / 14	0.1 / 0.0	4.2 / 4.3	1.9 / 1.9	No	No
	14 / 14	0.1 / 0.1	4.1 / 4.2	1.8 / 1.9	No	No
	14 / 14	0.1 / 0.1	4.0 / 4.1	1.7 / 1.8	No	No
State Route 247 and Buena Vista Drive	8 / 8	0.3 / 0.2	5.5 / 5.8	2.8 / 3.0	No	No
	8 / 8	0.3 / 0.3	5.3 / 5.6	2.6 / 2.9	No	No
	8 / 8	0.3 / 0.3	5.3 / 5.6	2.6 / 2.9	No	No
	8 / 8	0.3 / 0.2	5.0 / 5.3	2.4 / 2.6	No	No
State Route 247 and State Route 62	14 / 14	0.8 / 0.6	7.8 / 8.6	4.4 / 5.0	No	No
	14 / 14	0.9 / 0.7	7.7 / 8.6	4.3 / 5.0	No	No
	14 / 14	0.6 / 0.4	7.7 / 8.3	4.3 / 4.7	No	No
	14 / 14	0.6 / 0.4	7.7 / 8.3	4.3 / 4.7	No	No
Joshua Lane and Yucca Trail	17 / 17	0.1 / 0.1	5.3 / 5.4	2.6 / 2.7	No	No
	14 / 17	0.2 / 0.1	5.2 / 5.4	2.6 / 2.7	No	No
	14 / 14	0.1 / 0.1	5.1 / 5.2	2.5 / 2.6	No	No
	14 / 14	0.2 / 0.2	5.0 / 5.2	2.4 / 2.6	No	No
Joshua Lane and Onaga Trail	14 / 14	0.2 / 0.1	4.8 / 5.0	2.3 / 2.4	No	No
	12 / 12	0.1 / 0.1	4.7 / 4.8	2.2 / 2.3	No	No
	12 / 12	0.1 / 0.0	4.6 / 4.7	2.2 / 2.2	No	No
	12 / 12	0.1 / 0.1	4.5 / 4.6	2.1 / 2.2	No	No
Balsa Avenue and State Route 62	12 / 12	0.8 / 0.5	6.6 / 7.4	3.6 / 4.1	No	No
	10 / 10	0.7 / 0.4	6.6 / 7.3	3.6 / 4.0	No	No
	10 / 10	0.7 / 0.5	6.4 / 7.1	3.4 / 3.9	No	No
	10 / 10	0.8 / 0.6	6.3 / 7.1	3.3 / 3.9	No	No

Table 4.3.G ~~4.3.F~~ – 2007 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Avalon Avenue and State Route 62	8 / 8	1.0 / 0.7	6.7 / 7.7	3.6 / 4.3	No	No
	8 / 8	0.9 / 0.7	6.7 / 7.6	3.6 / 4.3	No	No
	8 / 8	0.7 / 0.5	6.7 / 7.4	3.6 / 4.1	No	No
	8 / 8	0.9 / 0.6	6.4 / 7.3	3.4 / 4.0	No	No
Avalon Avenue and Project Driveway	12 / 12	1.1 / 0.8	3.7 / 4.8	1.5 / 2.3	No	No
	12 / 12	0.8 / 0.6	3.7 / 4.5	1.5 / 2.1	No	No
	8 / 8	0.7 / 0.5	3.7 / 4.4	1.5 / 2.0	No	No
	7 / 8	0.8 / 0.5	3.6 / 4.4	1.5 / 2.0	No	No
Avalon Avenue and Palisades Drive	15 / 15	0.5 / 0.4	3.7 / 4.2	1.5 / 1.9	No	No
	15 / 15	0.5 / 0.4	3.7 / 4.2	1.5 / 1.9	No	No
	14 / 15	0.4 / 0.3	3.7 / 4.1	1.5 / 1.8	No	No
	14 / 7	0.3 / 0.2	3.7 / 4.0	1.5 / 1.7	No	No
Avalon Avenue and Yucca Trail	8 / 8	0.3 / 0.2	5.1 / 5.4	2.5 / 2.7	No	No
	8 / 8	0.3 / 0.2	5.0 / 5.3	2.4 / 2.6	No	No
	8 / 8	0.3 / 0.2	5.0 / 5.3	2.4 / 2.6	No	No
	8 / 7	0.3 / 0.2	5.0 / 5.3	2.4 / 2.6	No	No
Palomar Avenue and Joshua Lane	14 / 14	0.1 / 0.0	3.6 / 3.7	1.5 / 1.5	No	No
	14 / 14	0.1 / 0.1	3.5 / 3.6	1.4 / 1.5	No	No
	14 / 14	0.1 / 0.1	3.5 / 3.6	1.4 / 1.5	No	No
	14 / 14	0.1 / 0.1	3.5 / 3.6	1.4 / 1.5	No	No
Project Driveway and State Route 62	12 / 12	0.4 / 0.3	7.1 / 7.5	3.9 / 4.2	No	No
	8 / 8	0.7 / 0.5	6.7 / 7.4	3.6 / 4.1	No	No
	8 / 8	0.6 / 0.4	6.7 / 7.3	3.6 / 4.0	No	No
	8 / 8	0.5 / 0.3	6.5 / 7.0	3.5 / 3.8	No	No
Yucca Mesa Road and Buena Vista Drive	12 / 12	0.2 / 0.2	4.0 / 4.2	1.7 / 1.9	No	No
	8 / 8	0.1 / 0.1	4.0 / 4.1	1.7 / 1.8	No	No
	8 / 8	0.2 / 0.1	3.9 / 4.1	1.7 / 1.8	No	No
	8 / 8	0.2 / 0.1	3.9 / 4.1	1.7 / 1.8	No	No
Yucca Mesa Road and State Route 62	21 / 21	0.3 / 0.2	5.5 / 5.8	2.8 / 3.0	No	No
	21 / 21	0.2 / 0.2	5.3 / 5.5	2.6 / 2.8	No	No
	19 / 19	0.2 / 0.2	5.3 / 5.5	2.6 / 2.8	No	No
	19 / 19	0.2 / 0.1	5.2 / 5.4	2.6 / 2.7	No	No

Table 4.3.G ~~4.3.F~~ – 2007 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Contenta Road and Yucca Trail	8 / 8	0.2 / 0.2	4.4 / 4.6	2.0 / 2.2	No	No
	8 / 8	0.1 / 0.1	4.4 / 4.5	2.0 / 2.1	No	No
	8 / 8	0.2 / 0.2	4.3 / 4.5	1.9 / 2.1	No	No
	8 / 8	0.2 / 0.2	4.3 / 4.5	1.9 / 2.1	No	No
Sunny Vista Road and Alta Loma Road	10 / 10	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	10 / 10	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	10 / 10	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	10 / 10	0.2 / 0.1	3.8 / 4.0	1.6 / 1.7	No	No
Park Boulevard and State Route 62	7 / 7	0.2 / 0.1	6.8 / 7.0	3.7 / 3.8	No	No
	7 / 7	0.2 / 0.1	6.8 / 7.0	3.7 / 3.8	No	No
	7 / 7	0.2 / 0.2	6.7 / 6.9	3.6 / 3.8	No	No
	7 / 7	0.2 / 0.2	6.7 / 6.9	3.6 / 3.8	No	No
Park Boulevard and Alta Loma Road	2 / 2	0.2 / 0.1	4.1 / 4.3	1.8 / 1.9	No	No
	2 / 2	0.1 / 0.1	4.1 / 4.2	1.8 / 1.9	No	No
	2 / 2	0.1 / 0.1	4.1 / 4.2	1.8 / 1.9	No	No
	2 / 2	0.1 / 0.1	4.1 / 4.2	1.8 / 1.9	No	No
Project Access and State Route 62	2 / 2	1.2 / 0.9	9.4 / 10.6	5.5 / 6.4	No	No
	2 / 2	1.2 / 0.9	9.4 / 10.6	5.5 / 6.4	No	No
	2 / 2	1.0 / 0.7	9.4 / 10.4	5.5 / 6.2	No	No
	2 / 2	1.0 / 0.7	9.4 / 10.4	5.5 / 6.2	No	No

1 Includes ambient one-hour concentration of 3.1 ppm and ambient eight-hour concentration of 1.1 ppm. Measured at the Fs-590 Racquet Club Avenue, Palm Springs, California, Air Quality Station (Riverside County).
2 State one-hour CO standard is 20 ppm and eight-hour standard is 9.0 ppm.
Source: LSA Associates, Inc., August 2006.

Table 4.3.H ~~4.3.G~~ – 2030 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Inca Trail and State Route 62	8 / 8	0.0 / 0.0	3.8 / 3.8	1.6 / 1.6	No	No
	8 / 8	0.0 / 0.0	3.8 / 3.8	1.6 / 1.6	No	No
	8 / 8	0.0 / 0.0	3.8 / 3.8	1.6 / 1.6	No	No
	7 / 7	0.1 / 0.1	3.7 / 3.8	1.5 / 1.6	No	No

Table 4.3.H ~~4.3.G~~ – 2030 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Pioneertown Road and State Route 62	12 / 14	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	12 / 14	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
	8 / 12	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
	8 / 12	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
Sage Avenue and State Route 62/Yucca Trail	21 / 21	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	21 / 21	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
	21 / 21	0.1 / 0.1	3.8 / 3.9	1.6 / 1.7	No	No
	21 / 19	0.1 / 0.1	3.7 / 3.8	1.5 / 1.6	No	No
State Route 247 and Aberdeen Drive	14 / 14	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	14 / 14	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	14 / 14	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	14 / 14	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
State Route 247 and Buena Vista Drive	12 / 12	0.1 / 0.0	3.6 / 3.7	1.5 / 1.5	No	No
	12 / 12	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	12 / 12	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	12 / 12	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
State Route 247 and State Route 62	21 / 21	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	21 / 21	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
	18 / 18	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
	18 / 18	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
Joshua Lane and Yucca Trail	17 / 17	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	17 / 17	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	14 / 14	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	14 / 14	0.1 / 0.1	3.5 / 3.6	1.4 / 1.5	No	No
Joshua Lane and Onaga Trail	14 / 14	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	14 / 14	0.1 / 0.1	3.5 / 3.6	1.4 / 1.5	No	No
	14 / 14	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	14 / 14	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
Balsa Avenue and State Route 62	14 / 14	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	14 / 14	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	10 / 10	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
	10 / 10	0.1 / 0.1	3.8 / 3.9	1.6 / 1.7	No	No

Table 4.3.H ~~4.3.G~~ – 2030 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Avalon Avenue and State Route 62	8 / 8	0.1 / 0.1	3.8 / 3.9	1.6 / 1.7	No	No
	8 / 8	0.1 / 0.1	3.8 / 3.9	1.6 / 1.7	No	No
	8 / 8	0.1 / 0.1	3.8 / 3.9	1.6 / 1.7	No	No
	8 / 8	0.1 / 0.1	3.7 / 3.8	1.5 / 1.6	No	No
Avalon Avenue and Project Driveway	12 / 12	0.2 / 0.2	3.3 / 3.5	1.2 / 1.4	No	No
	12 / 12	0.1 / 0.1	3.3 / 3.4	1.2 / 1.3	No	No
	12 / 12	0.1 / 0.1	3.3 / 3.4	1.2 / 1.3	No	No
	8 / 8	0.1 / 0.1	3.3 / 3.4	1.2 / 1.3	No	No
Avalon Avenue and Palisades Drive	15 / 15	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	15 / 15	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	14 / 14	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	14 / 14	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
Avalon Avenue and Yucca Trail	12 / 12	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	12 / 12	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	8 / 8	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	7 / 8	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
Palomar Avenue and Joshua Lane	21 / 21	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	18 / 18	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	17 / 17	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	16 / 16	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
Project Driveway and State Route 62	12 / 12	0.0 / 0.0	4.0 / 4.0	1.7 / 1.7	No	No
	8 / 12	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	8 / 8	0.1 / 0.0	3.9 / 4.0	1.7 / 1.7	No	No
	8 / 8	0.0 / 0.0	3.9 / 3.9	1.7 / 1.7	No	No
Yucca Mesa Road and Buena Vista Drive	12 / 12	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	12 / 12	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	8 / 8	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
	8 / 8	0.0 / 0.0	3.3 / 3.3	1.2 / 1.2	No	No
Yucca Mesa Road and State Route 62	21 / 21	0.1 / 0.1	3.7 / 3.8	1.5 / 1.6	No	No
	21 / 21	0.0 / 0.0	3.7 / 3.7	1.5 / 1.5	No	No
	19 / 19	0.0 / 0.0	3.7 / 3.7	1.5 / 1.5	No	No
	19 / 19	0.1 / 0.0	3.6 / 3.7	1.5 / 1.5	No	No

Table 4.3.H ~~4.3.G~~ – 2030 Carbon Monoxide Concentrations[1] without/with Proposed Project

Intersection	Receptor Distance to Road Centerline (Meters)	Project-Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards[2]	
					1-Hr	8-Hr
Contenta Road and Yucca Trail	8 / 8	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	8 / 8	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	8 / 8	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
	8 / 8	0.0 / 0.0	3.5 / 3.5	1.4 / 1.4	No	No
Sunny Vista Road and Alta Loma Road	10 / 10	0.0 / 0.0	3.4 / 3.4	1.3 / 1.3	No	No
	10 / 10	0.0 / 0.0	3.4 / 3.4	1.3 / 1.3	No	No
	10 / 10	0.1 / 0.1	3.3 / 3.4	1.2 / 1.3	No	No
	10 / 10	0.1 / 0.1	3.3 / 3.4	1.2 / 1.3	No	No
Park Boulevard and State Route 62	7 / 7	0.1 / 0.0	4.2 / 4.3	1.9 / 1.9	No	No
	7 / 7	0.0 / 0.0	4.2 / 4.2	1.9 / 1.9	No	No
	7 / 7	0.1 / 0.1	4.1 / 4.2	1.8 / 1.9	No	No
	7 / 7	0.1 / 0.1	4.1 / 4.2	1.8 / 1.9	No	No
Park Boulevard and Alta Loma Road	2 / 2	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	2 / 2	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	2 / 2	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
	2 / 2	0.0 / 0.0	3.6 / 3.6	1.5 / 1.5	No	No
Project Access and State Route 62	2 / 2	0.1 / 0.1	4.3 / 4.4	1.9 / 2.0	No	No
	2 / 2	0.1 / 0.1	4.3 / 4.4	1.9 / 2.0	No	No
	2 / 2	0.1 / 0.0	4.2 / 4.3	1.9 / 1.9	No	No
	2 / 2	0.1 / 0.0	4.2 / 4.3	1.9 / 1.9	No	No

1 Includes ambient one-hour concentration of 3.1 ppm and ambient eight-hour concentration of 1.1 ppm. Measured at the Fs-590 Racquet Club Avenue, Palm Springs, California, Air Quality Station (Riverside County).
2 State one-hour CO standard is 20 ppm and eight-hour standard is 9.0 ppm.
Source: LSA Associates, Inc., August 2006.

As shown in Tables 4.3.F ~~4.3.E~~ through 4.3.H ~~4.3.G~~, none of the 22 intersections analyzed would have a one-hour CO concentration exceeding State standards of 20 ppm under the existing condition, 2007 with and without project conditions, and 2030 with and without project conditions. The eight-hour CO concentration at these intersections would also be below the State standard of 9.0 ppm. It should be noted that, as a result of technological improvements, CO emissions in the future (2030) would be lower than the existing condition. In addition, future ambient CO levels would be lower than current CO levels. Therefore, CO concentrations in 2030 (Table 4.3.H ~~4.3.G~~) are lower than existing conditions. Since no federal or State standards would be exceeded, no CO hotspots would occur.

Long-Term Exposure to Sensitive Receptors from Project-Related Diesel Exhaust

Threshold	Would the proposed project expose sensitive receptors to substantial pollutant concentrations?

Long-term diesel exhaust health risk assessment impacts are those associated with project-related truck deliveries to the proposed project site. In order to predict the impacts on human health by diesel-powered trucks that will perform delivery services for the project, the following analysis has been performed. The first step is to characterize the diesel truck delivery emissions. The number of deliveries that is considered normal for a Wal-Mart Supercenter, gas station, and fast-food restaurant was first estimated, then categorized as either 2-axle delivery trucks (light and medium sized trucks) or semi-trailer and fuel tanker trucks (heavy-duty trucks). The delivery schedule and idling times of the trucks was provided by the Wal-Mart Supercenter owners and is based on delivery operations at existing Supercenters. The PM_{10} emission rates are summarized in Table 4.3.I ~~4.3.H~~.

Table 4.3.I ~~4.3.H~~ – Delivery Truck Activity and Diesel Particulate Emissions

Truck Type	Deliveries per Week	Hours Idling per Delivery	No. of Hours per Day Deliveries Occur	No. of Days per Week that Deliveries Occur	PM_{10} Emission Factor* (g/hr)	Idling PM_{10} Emission rate (g/s)
Supercenter 2-axle delivery trucks	28	0.5	12	6	0.14	7.56E-06
Supercenter semi-trailer and tanker trucks	25	0	12	6	0.14	0
Gas station two-axle delivery trucks	10	0	8	6	0.14	0
Fast-food restaurant two-axle delivery trucks	3	0	8	6	0.14	0
Total:	66					7.56E-06

* Idling diesel exhaust emission factors from ARB study: Public Hearing to Consider the Adoption of Heavy-Duty Vehicle Emission Reduction Requirements, Appendix C, Table C-4, January 2004.
Source: LSA Associates, Inc., August 2006.

The nearby residents live at a variety of distances from the proposed delivery area. In order to present these multiple scenarios the screening health risk analysis has been performed at a range of distances so that it can be used for various Wal-Mart Supercenter stores with varying distances to residences. In this simpler screening analysis, on-site meteorological data, in which the wind direction and speed varies throughout the day and from day to day, is not used. The air dispersion model Tscreen3 predicts concentrations at these residences by assuming the wind always blows directly from the delivery area to the residence, resulting in a worst-case analysis. The results of this conservative modeling are shown in Table 4.3.J ~~4.3.I~~ for carcinogenic and chronic inhalation health risks at these selected distances.

Table 4.3.J ~~4.3.I~~ – Inhalation Health Risks Resulting from Delivery Truck Activity

Distance from Delivery Area to Residence (meters)	Carcinogenic Inhalation Health Risk	Chronic Inhalation Health Index
15	0.63 in a million	0.00039
30	0.55 in a million	0.00035
45	0.44 in a million	0.00028
60	0.36 in a million	0.00023
100	0.23 in a million	0.00015

Source: LSA Associates, Inc., August 2006.

Note that the thresholds are 10 in a million for the carcinogenic health risk and 1.0 for the chronic health index. Table 4.3.J ~~4.3.I~~ indicates that none of the scenarios would result in any significant health risk.

Table 4.3.K ~~4.3.J~~ presents two alternative delivery scenarios and their associated health risks. It shows the health risk from half the deliveries as well as double the deliveries.

Table 4.3.K ~~4.3.J~~ shows that, even for the case of doubling the delivery activity, no significant health risk would occur. It is expected that the closest residence will be approximately 180 meters (600 feet) from the delivery area. The inclusion of health risks at these closer ranges is included as a lower boundary of possible scenarios. Consequently, impacts associated with the proposed project are considered less than significant.

Table 4.3.K ~~4.3.J~~ – Inhalation Health Risks Resulting from Alternative Delivery Truck Activity Amounts

Distance from Delivery Area to Residence (meters)	Carcinogenic Inhalation Health Risk	Chronic Inhalation Health Index
Delivery truck activity level: one-half of the expected amount		
15	0.31 in a million	0.00020
30	0.28 in a million	0.00017
45	0.22 in a million	0.00014
60	0.18 in a million	0.00011
100	0.12 in a million	0.00007
Delivery truck activity level: twice the expected amount		
15	1.3 in a million	0.00079
30	1.1 in a million	0.00069
45	0.89 in a million	0.00056
60	0.73 in a million	0.00045
100	0.47 in a million	0.00029

Source: LSA Associates, Inc., August 2006.

Objectionable Odors

Threshold	Would the proposed project create objectionable odors affecting a substantial number of people?

The project proposes the construction and operation of approximately 229,000 square feet of supercenter commercial space (Wal-Mart) and an approximately 4,000-square foot fast-food restaurant. Odors typically associated with the proposed use include those associated with the preparation of food products, as well as temporary and/or short-term odor releases associated with construction activity (e.g., glues, paint, and asphalt). The control of such odors is typically achieved through the sanitary storage and disposal of organic waste and the utilization of equipment and/or measures to contain and/or neutralize objectionable odors.

Solid waste generated by the proposed on-site uses will be collected by a contracted waste hauler, ensuring that any odors resulting from on-site would be adequately managed. The Yucca Valley Retail Center Specific Plan does not provide specific regulations or standards for the handling and disposal of solid waste. Accordingly, the requirements of the Town's Municipal Code will govern handling and disposal of solid waste. Chapter 6.02 (Solid Waste Handling and Recycling Services) of the Town's Municipal Code has requirements that all development projects must adhere to. In particular, Ordinance 6.02.130 (Storage Areas) and Ordinance 6.02.110 (Collection Regulations) specify the manner in which solid waste is disposed, stored, and collected within the Town of Yucca Valley. The nearest sensitive receptors to the project site are the residential dwellings located approximately 150 feet to the southwest as measured from the nearest property line of the project site. However, the distance from the fast-food restaurant to the sensitive receptors would be approximately 500 feet and the distance from the supercenter trash enclosures would be approximately 750 feet. Due to the distance to these uses and because solid waste from the project will be managed and collected in manner to prevent the proliferation of odors, impacts from objectionable odors generated by the project would be reduced to below a significant level.

Potentially Significant Impacts

The following impacts were determined to be potentially significant. In each of the following issues, a potential impact would occur and mitigation would be required.

Impact 4.3.1 Short-Term Construction Emissions

Threshold	Would the proposed project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard during the construction phase of the project?

Equipment Exhaust from Construction-Related Activities. Construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. Exhaust emissions from construction activities envisioned on-site would vary daily as construction activity levels change. The use of construction equipment on-site would result in localized exhaust emissions.

Based on construction estimates for similar projects, such as the Wal-Mart Supercenter at Canyon Crossings project in Riverside and the Valley Central Shopping Center Revitalization project in the City of Lancaster, peak daily emissions associated with construction equipment exhaust for the proposed project during grading periods are summarized in Table 4.3.L ~~4.3.K~~. This table identifies that construction equipment/vehicle emissions during grading periods would exceed the MDAQMD established daily emissions threshold for NOx. Emissions of all other pollutants would remain below MDAQMD thresholds.

~~**Table 4.3.K – Emissions from Construction Equipment Exhaust – Grading**~~

~~Source~~	~~Hours/Miles~~	~~Pollutants (lbs/day)~~				
		~~CO~~	~~ROC~~	~~NOx~~	~~SOx~~	~~PM_{10}~~
~~2 Excavators~~	~~8~~	~~15.8~~	~~1.4~~	~~33.8~~	~~2.8~~	~~1.3~~
~~3 Dozers~~	~~8~~	~~43.2~~	~~4.5~~	~~100.2~~	~~8.4~~	~~3.9~~
~~3 Scrapers~~	~~8~~	~~30.0~~	~~6.5~~	~~92.1~~	~~11.1~~	~~9.9~~
~~1 Tracked Loader~~	~~8~~	~~1.6~~	~~0.8~~	~~6.6~~	~~0.6~~	~~0.5~~
~~1 Tracked Tractor~~	~~8~~	~~2.8~~	~~1.0~~	~~10.0~~	~~1.1~~	~~0.9~~
~~1 Motor Grader~~	~~8~~	~~1.2~~	~~0.3~~	~~5.7~~	~~0.7~~	~~0.5~~
~~1 Water Truck~~	~~30 miles~~	~~1.2~~	~~0.1~~	~~0.5~~	~~0.0~~	~~0.0~~
~~30 Haul Truck~~	~~40 miles~~	~~17.2~~	~~2.9~~	~~25.0~~	~~0.0~~	~~1.8~~
~~24 Workers Trips~~	~~40 miles~~	~~7.2~~	~~0.4~~	~~1.4~~	~~0.0~~	~~0.0~~
~~**TOTAL**~~		~~**120**~~	~~**18**~~	~~**275**~~	~~**25**~~	~~**19**~~
~~**MDAQMD Threshold**~~ ~~**Exceeds Threshold?**~~		~~**548**~~ ~~**No**~~	~~**137**~~ ~~**No**~~	~~**137**~~ ~~**Yes**~~	~~**137**~~ ~~**No**~~	~~**82**~~ ~~**No**~~

~~Source: LSA August 2006; MDAQMD CEQA and Federal Conformity Guidelines, July 2006; and EPA, *AP-42*, *Fifth Edition*, 1995.~~

Table 4.3.L – Emissions from Construction Equipment Exhaust – Grading

Source	**Hours/Miles**	**Pollutants (lbs/day)**						
		CO	**ROC**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
2 Excavators	8	9.6	2.9	23	0.021	1.2	1.1	1,913
3 Dozers	8	41	9.1	82	0.059	3.5	3.1	5,739
3 Scrapers	8	37	8.8	82	0.064	3.5	3.1	6,300
1 Tracked Loader	8	3.3	1.0	6.6	0.006	0.51	0.46	534
1 Tracked Tractor	8	5.7	1.7	1.3	0.010	0.79	0.70	912
1 Motor Grader	8	5.4	1.6	14	0.012	0.71	0.63	1,062
1 Water Truck	30 miles	0.46	0.035	0.082	6E-04	0.043	0.003	64
30 Haul Truck	40 miles	21	2.8	36	0.040	1.4	1.0	4,114
24 Workers Trips	40 miles	6.2	0.27	0.78	0.006	0.059	0.042	626
TOTAL		78	16	152	0.14	7.0	2.9	13,613

Table 4.3.L – Emissions from Construction Equipment Exhaust – Grading

Source	Hours/Miles	Pollutants (lbs/day)						
		CO	ROC	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
MDAQMD Threshold Exceeds Threshold?		548 No	137 No	137 Yes	137 No	82 No	55[1] No	NA

Source: LSA August 2007; MDAQMD CEQA and Federal Conformity Guidelines, July 2006; and EPA, *AP-42, Fifth Edition*, 1995.
1. Because the MDAQMD does not have a PM2.5 threshold, the stated threshold is from the SCAQMD.

Fugitive Dust. Fugitive dust emissions are generally associated with demolition, land clearing, exposure, and cut and fill operations. Dust generated daily during construction would vary substantially, depending on the level of activity, the specific operations, and weather conditions. Nearby sensitive receptors and on-site workers may be exposed to blowing dust, depending upon prevailing wind conditions. Fugitive dust would also be generated as construction equipment or trucks travel on unpaved roads on the construction site.

PM_{10} emissions from grading operations during a peak construction day are based on assumptions and past experience on similar sized projects. The South Coast Air Quality Management District (SCAQMD) estimates that each acre of graded surface generates approximately 26.4 pounds of PM_{10} per workday during the construction phase of the project. Additionally, each bulldozer generates approximately 21.8 pounds of PM_{10} during movement of soils. The project site consists of approximately 25.51 acres. The entire project site is not expected to be disturbed at any one time. It is assumed that up to 10 acres of land would be under construction or exposed on any one day. It is also assumed that three dozers would be used eight hours per day, together with other equipment. Based on these assumptions, a maximum of 787.2 pounds of PM_{10} per day[1] would be generated on a peak grading day.

The project is required to comply with regional rules that assist in reducing short-term air pollutant emissions. MDAQMD Rule 403 requires that fugitive dust be controlled so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Adherence to Rule 403 is a standard requirement for any development project occurring within the MDAQMD. Applicable fugitive dust control measures identified in Rule 403 include:

403(a) A person shall not cause or allow the emissions of fugitive dust from any transport, handling, construction or storage activity so that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source. (Does not apply to emissions emanating from unpaved roadways open to public travel or farm roads. This exclusion shall not apply to industrial or commercial facilities.)

403(b) A person shall take every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, clearing of land and solid waste disposal operations.

403(c) A person shall not cause or allow particulate matter to exceed 100 micrograms per cubic meter when determined as the difference between upwind and downwind samples collected on high volume samplers at the property line for a minimum of five hours.

1 10 acres at 26.4 pounds/day/acre = 264 pounds/day; 3 dozers at 8 hours and 21.8 pounds/hour = 523 pounds/day; 264 pounds/day + 523 pounds/day = 787 pounds/day.

403(d) A person shall take every reasonable precaution to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations. Reasonable precautions shall include, but are not limited to, the removal of any matter from equipment prior to movement on paved streets or the prompt removal of any material from paved streets onto which such material has been deposited.

403(e) Subsections a) and c) shall not be applicable when the wind speed instantaneously exceeds 40 kilometers (25 miles) per hour, or when the average wind speed is greater than 24 kilometers (15 miles) per hour. The average wind speed determination shall be on a 15-minute average at the nearest official air-monitoring station or by wind instrument located at the site being checked.

Table 4.3.M ~~4.3.L~~ lists total construction emissions (fugitive dust emissions and construction equipment exhausts) during peak grading periods. As shown in this table, daily total construction emissions with or without PM_{10} mitigation measures would exceed the MDAQMD threshold for NOx and PM_{10} during peak day construction. Emissions of the other three air pollutant emissions would be below the daily thresholds established by the MDAQMD without mitigation.

~~**Table 4.3.L – Peak Grading Day – Total Emissions (lbs/day)**~~

~~**Category**~~	~~**CO**~~	~~**ROC**~~	~~**NOx**~~	~~**SOx**~~	~~**PM_{10}**~~
~~Vehicle/Equipment Exhaust~~	~~120~~	~~18~~	~~275~~	~~25~~	~~19~~
~~Fugitive Dust from Soil Disturbance: No Mitigation~~	—	—	—	—	~~787.2~~
~~Fugitive Dust from Soil Disturbance: with Mitigation (50% effectiveness)~~	—	—	—	—	~~393.6~~
~~Total Grading: Without Fugitive Dust Control~~	~~120~~	~~18~~	~~275~~	~~25~~	~~806~~
~~Total Grading: With Fugitive Dust Control~~	~~120~~	~~18~~	~~275~~	~~25~~	~~413~~
~~**MDAQMD Threshold**~~	~~**548**~~	~~**137**~~	~~**137**~~	~~**137**~~	~~**82**~~
~~**Exceeds MDAQMD Threshold?**~~	~~**No**~~	~~**No**~~	~~**Yes**~~	~~**No**~~	~~**Yes**~~

~~Source: LSA Associates, Inc. and MDAQMD, August 2006.~~

Table 4.3.M – Peak Grading Day – Total Emissions (lbs/day)

Category	**CO**	**ROC**	**NOx**	**SOx**	**PM_{10}**
Vehicle/Equipment Exhaust	120	18	275	25	7
Fugitive Dust from Soil Disturbance: No Mitigation	—	—	—	—	787.2
Fugitive Dust from Soil Disturbance: with Mitigation (50% effectiveness)	—	—	—	—	393.6
Total Grading: Without Fugitive Dust Control	120	18	275	25	794
Total Grading: With Fugitive Dust Control	120	18	275	25	401
MDAQMD Threshold	**548**	**137**	**137**	**137**	**82**
Exceeds MDAQMD Threshold?	**No**	**No**	**Yes**	**No**	**Yes**

Source: LSA Associates, Inc. and MDAQMD, August 2007.

Application of Architectural Coatings. Architectural coatings contain volatile organic compounds (VOCs), which are similar to ROCs and are ozone precursors. Emissions associated with architectural coatings can be reduced by using precoated/natural-colored building materials, water-based or low-VOC coating, and using coating transfer or spray equipment with high transfer efficiency. For example, the high-volume low-pressure (HVLP) spray method is a coating application system operated at air pressure between 0.1 and 10 pounds per square inch gauge (psig) with 65 percent transfer efficiency. Manual coating applications, such as paint brush, hand roller, trowel, spatula, dauber, rag, or sponge, have 100 percent transfer efficiency. The proposed project will be required to comply with MDAQMD Rule 1113 which limits the quantity of VOCs in architectural coatings.

An estimate of architectural coating application was made for the project based on a ratio of two square feet of surface area to be painted for every square foot of building area. Using a VOC emission factor of 11.58 poundS/1,000 square feet (which assumes an 8 mil thickness), the project is estimated to generate approximately 5,400 pounds of VOC. Assuming the period of application is approximately one week, the project would generate approximately 1,080 pounds of VOC per day. Short-term impacts to air quality from architectural coating application would therefore exceed the MDAQMD emissions threshold of 137 lbs/day. Because these emissions would occur at the end of the construction period and after grading has occurred, they would not add to the construction emissions noted in previously referenced Table 4.3.M ~~4.3.L~~.

Mitigation Measure. Implementation of Mitigation Measure 4.3.1A will reduce impacts related to equipment exhaust, fugitive dust, and architectural coatings.

4.3.1A Prior to issuance of grading permits, the construction contractor shall provide evidence showing that the following measures shall be implemented to reduce NOx and PM_{10} emissions from ground disturbance and VOC emissions from application of architectural coatings:

- The construction contractor shall select the construction equipment used on site based on low emission factors and high energy efficiency. The construction contractor shall ensure that construction grading plans include a statement that all construction equipment will be tuned and maintained in accordance with the manufacturer's specifications.
- The construction contractor shall demonstrate to the Town that construction activities shall make use of alternatively fueled equipment or catalyst-equipped diesel powered equipment to the extent such alternative fuels are available.
- The construction contractor shall ensure that construction grading plans include a statement that work crews will shut off equipment when not in use.
- The construction contractor shall time the construction activities so as not to interfere with peak hour traffic and to minimize obstruction of through traffic lanes adjacent to the site; if necessary, a flagperson shall be retained to maintain safety adjacent to existing roadways.
- The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew.

- The construction contractor shall demonstrate compliance with the fugitive dust suppression measures 403 a) through 403 e) contained in MDAQMD Rule 403.
- The construction contractor shall demonstrate compliance with the VOC suppression measures contained in MDAQMD 1113.
- The construction contractor shall apply non-toxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
- The construction contractor shall water active sites at least twice daily (Locations where grading is to occur shall be thoroughly watered prior to earthmoving).
- The construction contractor shall provide evidence to the Town that all trucks hauling dirt, sand, soil, or maintain at least two feet of freeboard (vertical space between the top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code (CVC) section 23114.
- The construction contractor shall pave construction access roads at least 100 feet onto the site from the main road.
- The construction contractor shall promote the reduction of traffic speeds on all unpaved roads to 15 miles per hour (mph) or less.

Level of Significance after Mitigation. Despite the implementation of the above-stated measures, potential impacts associated with NOx emissions from construction equipment exhaust, PM_{10} emissions from construction equipment exhaust and fugitive dust from ground disturbance activities, and VOC emissions from application of architectural coatings remains significant and unavoidable.

Impact 4.3.2: Long-Term Project-Related Emissions Impacts.

Threshold	Would the proposed project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard during the operational phase of the project?

Long-term air emission impacts are those associated with stationary sources and mobile sources related to the proposed project. Under build out of the proposed development, the project would consist of commercial uses on 25.51 acres. The stationary source emissions from these land uses would come from consumption of natural gas and electricity. Based on the traffic study prepared for this project (LSA, August 2006), the proposed project would generate 11,226 new net ~~10,590~~ vehicle trips per day. Project emissions from stationary and mobile sources are shown in Table 4.3.N ~~4.3.M~~. Emissions associated with stationary and mobile sources were calculated for the opening year (2006) as a worst-case scenario with URBEMIS 2007 ~~2002~~. Emissions associated with stationary sources would be minimal when compared to mobile source emissions. As shown in Table 4.3.N ~~4.3.M~~, project-related emissions for CO, ROC, NOx, and PM_{10} would exceed the MDAQMD daily emissions thresholds. As noted previously, the vehicle trips generated by the proposed project will not result in any CO hotspots. Therefore, the project's exceedance of the MDAQMD's CO threshold will not result in an exceedance of the ambient air quality standards for CO. Pollutant emissions of NOx that would exceed the MDAQMD thresholds may contribute to ozone formation in the region.

Table 4.3.M – Project Operational Emissions[1]

Source	Pollutants (lbs/day)				
	CO	ROC	NOx	SO_2	PM_{10}
Stationary Sources: Summer	4.3	2.1	2.4	0.00	0.01
Vehicular Traffic: Summer	1,718	138	242	1.7	173
Subtotal Summer	1722	140	244	1.7	173
Stationary Sources: Winter	2.0	1.8	2.4	0.00	0.00
Vehicular Traffic: Winter	2,098	174	290	1.7	173
Subtotal Winter	2,100	176	292	1.7	173
MDAQMD Threshold	**548**	**137**	**137**	**137**	**82**
Exceeds Threshold?	**Yes/Yes**[2]	**Yes/Yes**[2]	**Yes/Yes**	**No/No**	**Yes/Yes**

1 Calculated for the opening year, 2006, as a worst-case scenario.
2 Summer/winter exceedance.
Source: LSA Associates, Inc., August 2006.

Table 4.3.N – Project Operational Emissions[1]

Source	Pollutants (lbs/day)					
	CO	ROC	NOx	SO_2	PM_{10}	$PM_{2.5}$
Stationary Sources: Summer	7.1	2.0	2.3	0.00	0.01	0.01
Vehicular Traffic: Summer	1,500.0	120.0	210.0	1.1	180.0	36.0
Subtotal Summer	1,510.0	120.0	210.0	1.1	180.0	36.0
Stationary Sources: Winter	1.9	1.5	2.3	0.00	0.0	0.00
Vehicular Traffic: Winter	1,500.0	140.0	250.0	0.94	180.0	36.0
Subtotal Winter	1,500.0	140.0	250.0	0.94	190.0	36.0
MDAQMD Threshold	**548**	**137**	**137**	**137**	**82**	–
Exceeds Threshold?	**Yes/Yes**[2]	**No/Yes**[2]	**Yes/Yes**	**No/No**	**Yes/Yes**	–

1 Calculated for the opening year, 2006, as a worst-case scenario.
2 Summer/winter exceedance.
Source: LSA Associates, Inc., November 2007.

Mitigation Measures. Implementation of Mitigation Measure 4.3.2A would reduce impacts related to operational emissions.

4.3.2A Prior to issuance of building permits, the project applicant shall provide evidence to the Town that applicable (as determined by the Town) Transportation Demand Management (TDM) measures are incorporated into the design of the proposed project. At a minimum, the TDM measures shall include: 1) Bicycle Storage – The project shall provide secure, adequate and convenient bicycle storage facilities for a minimum of 12 bicycles; 2) Information Center – A transportation information center shall be provided within the Wal-Mart store; and 3) preferential parking for employee carpool. The information center shall be located in a central location will good customer visibility. The information center shall provide information concerning public transportation options including route and schedules for local bus service.

Level of Significance after Mitigation. Although implementation of the above stated measures may reduce vehicle trips associated with the proposed project, it is not possible to quantify the reduction in the amount of emissions that may occur. Considering the volume of emissions estimated to be generated by the project and current commuter habits of retail customers, it is unlikely that the implementation of TDM measures will result in a reduction of operational project emissions to below MDAQMD thresholds. No other mitigation measures have been identified to reduce the operational emissions of CO, ROC, NOx, and PM_{10} to a less than significant level.

Because the project site is located in a nonattainment air basin for criteria pollutants, and in the absence of mitigation measures that would reduce the proposed project's emission of contribution of CO, ROC, NOx, and PM_{10} to below MDQAMD thresholds, potential long-term air quality impacts resulting from the operation of the proposed project will remain significant and unavoidable.

Impact 4.3.3: Global Climate Change (Green House Gas Emissions)

Threshold	Would the proposed project conflict with the emission reduction strategies contained in the California Climate Action Team's Report to the Governor?

As discussed previously, the methodology used in this EIR to analyze the project's potential effect on global warming includes a calculation of GHG emissions. The purpose of calculating the emissions is for informational purposes, as there is no quantifiable emissions threshold. Rather, the project's potential for creating an impact on global warming is based on a comparative analysis of the project against the emission reduction strategies contained in the California CATs Report to the Governor. If it is determined that the proposed project is compatible or consistent with the applicable CAT strategies, then the project's cumulative impact on global climate change is considered less than significant.

Project Carbon Dioxide Emissions. The project will generate emissions of carbon dioxide primarily in the form of vehicle exhaust and in the consumption of natural gas and electricity ~~for heating~~. Carbon dioxide emissions from vehicles (derived from information contained in the project-specific traffic study) were calculated using URBEMIS2002 assumptions and EMFAC2002 emission factors that are used in URBEMIS2002. The URBEMIS model has assumptions built-in to tailor trip length to a specific land use. Based on the total trip length, the EMFAC2007 Model was utilized to estimate carbon dioxide emissions. Natural gas usage was estimated based on total square footage. The ~~Carbon~~ carbon dioxide emissions from natural gas combustion were generated using an EPA AP-42 emission factor (120,000 pounds CO_2/million cubic feet of natural gas) (EPA 1998). Emissions from the generation and consumption of electricity were estimated based on the size of the proposed on-site uses. Utilizing an electrical use factor of 15.5 kWh per square foot of building per year[1] and a CO

1. www.eia.doe.gov/emeu/cbecs/pba99/mercantile/mercantileconstable.html, site accessed October 16, 2007.

generation rate of 0.61 lb/kWh,[1] the proposed uses would generate approximately 1,102 tons of CO per year. The carbon dioxide emissions estimated from the various uses are detailed are shown in Table 4.3.O 4.3.N. As shown in Table 4.3.O 4.3.N, the project will emit 0.007 0.006 Tg CO_2 Eq. in year 2013, which is 0.0015 0.0013 percent of California's total estimated GHG emissions (492 Tg CO_2 Eq.).

Table 4.3-N: Carbon Dioxide Emissions

Emission Source	Carbon Dioxide Emissions					
	2004-08	2009	2010	2011	2012	2013
Vehicles	5,826	5,834	5,834	5,834	5,911	5,911
Natural Gas Combustion	487	487	487	487	487	487
Total	**6,312**	**6,320**	**6,320**	**6,320**	**6,398**	**6,398**
Total (Tg CO_2 Eq.)	**0.006**	**0.006**	**0.006**	**0.006**	**0.006**	**0.006**
Source: LSA 2007a						

Table 4.3.O – Carbon Dioxide Emissions

Emission Source	Carbon Dioxide Emissions					
	2004-08	**2009**	**2010**	**2011**	**2012**	**2013**
Vehicles	5,826	5,834	5,834	5,834	5,911	5,911
Natural Gas Combustion	487	487	487	487	487	487
Electricity Production/Use	1,102	1,102	1,102	1,102	1,102	1,102
Total	**7,414**	**7,414**	**7,414**	**7,414**	**7,414**	**7,414**
Total (Tg CO_2 Eq.)	**0.007**	**0.007**	**0.007**	**0.007**	**0.007**	**0.007**

Source: LSA 2007a

Project Methane Emissions. The project will generate some methane gas from vehicle emissions and natural gas combustion. Methane emissions from natural gas combustion were generated using an EPA AP-42 emission factor (2.3 pounds CH4/million cubic feet of natural gas) (EPA 1998). Methane emissions from vehicles were estimated using U.S. EPA emission factors for on-highway vehicles (EPA 2004)[2] and the same assumptions used to estimate criteria pollutants in URBEMIS2002. Based on the electricity usage and a factor of 0.067 pound/MWh, the methane emissions associated with the use of electricity would total 0.012 ton/year. The emissions are shown in Table 4.3.P 4.3-O. As shown in Table 4.3.O 4.3-N, the project will emit 0.00024 Tg CO_2 Eq. in 2013, which is 0.000005 percent of California's total estimated GHG emissions.

Table 4.3-O: Methane Emissions

Emission Source	Methane Emissions (tons per year)					
	2004-08	2009	2010	2011	2012	2013

1 www.wri.org/climate/pubs_description.cfm?pid=3756, site accessed October 16, 2007.

2 *Update of Methane and Nitrous Oxide Emission Factors for On-Highway Vehicles* [Table 28], United States Environmental Protection Agency, November 2004.

Vehicles	1.10	1.10	1.10	1.10	1.10	1.10
Natural Gas Combustion	0.009	0.009	0.009	0.009	0.009	0.009
Total	1.11	1.11	1.11	1.11	1.11	1.11
Total (Tg CO_2 Eq.)	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Source: LSA 2007a						

Table 4.3.P – Methane Emissions

Emission Source	**Methane Emissions (tons per year)**					
	2004-08	**2009**	**2010**	**2011**	**2012**	**2013**
Vehicles	1.10	1.10	1.10	1.10	1.10	1.10
Natural Gas Combustion	0.009	0.009	0.009	0.009	0.009	0.009
Electricity Production/Use	0.012	0.012	0.012	0.012	0.012	0.012
Total	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**	**1.11**
Total (Tg CO_2 Eq.)	**0.000024**	**0.000024**	**0.000024**	**0.000024**	**0.000024**	**0.000024**

Source: LSA 2007a

Project Nitrous Oxide Emissions. The project would generate small amounts of nitrous oxide from vehicle emissions. Emissions from natural gas combustion were generated using an EPA AP-42 emission factor (2.3 pounds N_2O/million cubic feet of natural gas) (EPA 1998). Based on the electricity usage and a factor of 0.0037 pound/MWh, the nitrous oxide emissions associated with the use of electricity would total 0.012 ton/year. Nitrous oxide from vehicles was estimated using U.S. EPA emission factors for on-highway vehicles (EPA 2004) and the same assumptions that were used to estimate criteria pollutants. The emissions are presented in Table 4.3-Q 4.3-P. As shown in Table 4.3-Q 4.3-P, the project will emit 0.0001 Tg CO_2 Eq. in year 2013, which is 0.00003 percent of California's total estimated GHG emissions.

Table 4.3-P: Nitrous Oxide Emissions

Emission Source	**Nitrous Oxide Emissions**					
	2004-08	2009	2010	2011	2012	2013
Vehicles	0.42	0.42	0.42	0.42	0.42	0.42
Natural Gas Combustion	0.0089	0.0089	0.0089	0.0089	0.0089	0.0089
Total (tons per year)	**0.43**	**0.43**	**0.43**	**0.43**	**0.43**	**0.43**
Total (Tg CO_2 Eq.)	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	**0.0001**
Source: LSA 2007a						

Table 4.3.Q – Nitrous Oxide Emissions

Emission Source	**Nitrous Oxide Emissions**					
	2004-08	**2009**	**2010**	**2011**	**2012**	**2013**
Vehicles	0.42	0.42	0.42	0.42	0.42	0.42
Natural Gas Combustion	0.0089	0.0089	0.0089	0.0089	0.0089	0.0089
Electricity Production/Use	0.0067	0.0067	0.0067	0.0067	0.0067	0.0067
Total (tons per year)	**0.43**	**0.43**	**0.43**	**0.43**	**0.43**	**0.43**

Table 4.3.Q – Nitrous Oxide Emissions

Emission Source	Nitrous Oxide Emissions					
	2004-08	2009	2010	2011	2012	2013
Total (Tg CO_2 Eq.)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Source: LSA 2007a

Water Vapor. The project does not contribute to this greenhouse gas because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks and not emissions from industrial and commercial activities.

Ozone. Ozone is a greenhouse gas; however, unlike the other greenhouse gases, ozone in the troposphere is relatively short-lived and therefore is not global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of ozone precursors (NOx and VOCs to global warming (CARB 2004b). Therefore, project emissions of ozone precursors would not significantly contribute to global climate change.

Chlorofluorocarbons. As mentioned previously, there is a ban for chlorofluorocarbons; therefore, the project will not generate emissions of these greenhouse gases and is not considered any further in this analysis.

Hydrofluorocarbons. The project may emit a small amount of HFC emissions from leakage and service of refrigeration and air conditioning equipment and from disposal at the end of the life of the equipment (EPA 2004c). Wal-Mart currently uses R404a refrigerant for all refrigeration equipment. For all air conditioning units, Wal-Mart uses R410a refrigerant exclusively. R410a refrigerant results in lower emissions of HFCs compared to the R-22 refrigerant still used by many companies in their air conditioning units.

Perifuorocarbons, and Sulfur Hexafluoride. Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the project. Therefore, it is not anticipated that the project would emit any of these greenhouse gases.

Comparative/Consistency Analysis with GHG Reduction Strategies. The primary greenhouse gas generated by the project would be carbon dioxide. ~~At buildout, total unmitigated carbon~~ Annual carbon dioxide equivalent~~s~~[1] emissions of ~~for~~ carbon dioxide, methane, and nitrous oxide would total up to 0.007124 ~~be 0.0343~~ Tg CO_2 Eq, which is 0.0014 ~~0.007~~ percent of California's 2004 total emissions for carbon dioxide, methane, and nitrous oxide (492 Tg CO_2 Eq).

[1] All greenhouse gases are presented in units of teragrams of carbon dioxide equivalents (Tg CO2 Eq.).

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400-450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below 2°C, which in turn is assumed to be necessary to avoid 'dangerous' climate change (IPCC 2001).

California Governor Arnold Schwarzenegger announced on June 1, 2005 through Executive Order S-3-05 (Climate Change) GHG emission reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels (CA 2005). Some literature equates these reductions to 11 percent by 2010 and 25 percent by 2020.

AB-32 requires that by January 1, 2008, the state board shall determine what the statewide greenhouse gas emissions level was in 1990, and approve a statewide greenhouse gas emissions limit that is equivalent to that level, to be achieved by 2020. While the level of 1990 GHG emissions has not been approved at this time, other publications indicate that levels varied from 425 to 468 Tg CO_2 Eq. (CEC 2006). In 2004, the emissions were estimated at 492 Tg CO_2 Eq. (CEC 2006). Using the range of 1990 emissions, a reduction of 5 between 13 percent would be needed to reduce 2004 levels to 1990 levels.

The California Environmental Protection Agency Climate Action Team developed a report that "proposes a path to achieve the Governor's targets that will build on voluntary actions of California businesses, local government and community actions, and State incentive and regulatory programs" (CA 2006). The report indicates that the strategies will reduce California's emissions to the levels proposed in Executive Order S-3-05. The strategies that apply to the project are contained in Table 4.3.R ~~4.3-Q~~. As shown in the table, the project complies with the potential measures to bring California to the emission reduction targets. The increase in energy efficiency and programs designed to promote fuel conservation through the reduction in vehicle trips changes will reduce the contribution to greenhouse gases and global climate change.

Strategies identified in Table 4.3.R ~~4.3-Q~~ are actions that would reduce greenhouse gas emissions. Some of these strategies are standards that are required of all development projects while others are actions that Wal-Mart has committed to implementing with the development of the project. The strategies listed in Table 4.3.R ~~4.3-Q~~ should not be construed as mitigation as these are either required of all development projects or are voluntary programs that Wal-Mart would implement. While there are some mitigation measures identified in Table 4.3.R ~~4.3-Q~~, these serve as reference to project compliance and are discussed in each of their respective sections.

Table 4.3.R ~~4.3-Q –~~ Project Compliance with Greenhouse Gas Emission Reduction Strategies

Strategy	Project Compliance with Mitigation
California Air Resources Board (CARB)	
▪ **Vehicle Climate Change Standards** AB 1493 (Pavley) required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by the ARB in September 2004. ▪ **Heavy-Duty Vehicle Emission Reduction Measures** Increased efficiency in the design of heavy duty vehicles and an education program for the heavy duty vehicle sector.	***Compliant.*** The vehicles that access the project will be in compliance with any vehicle standards that CARB proposes.
▪ HFC Reduction Strategies **1)** Ban retail sale of HFC in small cans; **2)** Require that only low GWP refrigerants be used in new vehicular systems; **3)** Adopt specifications for new commercial refrigeration; **4)** Add refrigerant leak-tightness to the pass criteria for vehicular Inspection and Maintenance programs; **5)** Enforce federal ban on releasing HFCs.	***Compliant.*** Wal-Mart currently uses R404a, refrigerant for all refrigeration equipment. For all air conditioning units, Wal-Mart uses R410a refrigerant exclusively. R410a refrigerant results in lower emissions of HFCs compared to the R-22 refrigerant still used by many companies in their air conditioning units.
Integrated Waste Management	
▪ **Recycling – Achieve 50% Statewide Recycling Goal** Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48% has been achieved on a statewide basis. Therefore, a 2% additional reduction is needed. ▪ **Zero Waste – High Recycling** Additional recycling beyond the State's 50% recycling goal.	***Compliant.*** The Wal-Mart Supercenter is designed to limit waste of recyclable material by implementing innovative strategies including the following: • All Wall-Mart Supercenters collect and recycle all motor oil, tires and automobile batteries from its TLE operation; • All cardboard generated from delivery packages is segregated and sent to a recycling center; • Vegetable Oil: Each new super center has an indoor tank used to collect oil from cooking processes for recycling; • Single-use Cameras: All Wall-Mart photo processing centers recycle single use cameras after photo processing; • Wal-Mart collects and segregates all recyclable bottles and cans; • Wal-Mart currently implements a chain wide program for "sandwich bale" recycling of plastics, e.g., bags, garment bags, shrink wrap, bubble pack, etc.; • Silver: Wal-Mart photo labs capture silver

Table 4.3.R ~~4.3-Q~~ Project Compliance with Greenhouse Gas Emission Reduction Strategies

Strategy	Project Compliance with Mitigation
	from the photo processing. **Wal-Mart Supercenter Buildings are Constructed using Recycled Materials.** • Steel recycling: New Wal-Mart Supercenters are built of nearly 100% recycled structural steel. Structural steel suppliers use high efficient electric arc furnaces that use 50% less energy to manufacture recycled steel. Using recycled steel means less mining for new steel and it is a material which can be readily recycled again if the building is demolished. • Recycled Plastic: The plastic baseboards, and much of the plastic shelving, is manufactured from recycled material. • Flyash in Concrete**:** The concrete used in building construction contains 10% flyash, an industrial byproduct from coal fired power generation processes. Wal-Mart is now changing their specifications for exterior concrete paving to allow for 25% flyash.
Energy Commission	
▪ **Building Energy Efficiency Standards in Place and in Progress** Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).	***Compliant.*** The proposed project will be required to comply with the updated Title 24 standards for building construction including exterior lighting requirements. Some of the changes required in the new standards include requirements for indoor lighting efficiency, skylights in 'supercenter' stores with controls to shut off lights when daylight is available, cool roof coating requirements, duct insulation, and efficient space conditioning. The project will provide additional reduction of energy consumption by designing the buildings to a building efficiency rating which is 10 percent greater that the Title 24 requirement. The 2005 Title 24 standards for nonresidential construction provide an *8.5* percent reduction in electrical demand compared to the 2001 standards (CEC 2005). By providing a 10 percent increased energy efficiency over the required 2005 standard, the proposed project reduces greenhouse gas emissions. Project attributes that will contribute to this reduction

Table 4.3.R ~~4.3-Q –~~ Project Compliance with Greenhouse Gas Emission Reduction Strategies

Strategy	Project Compliance with Mitigation
	include: • Installation of high efficiency heating ventilation and air conditioning units that exceed industry standard energy efficiency ratio by between 4-17%; • Capture of waste heat from refrigeration equipment for heating water for kitchen preparation areas, saving 165 million BTU's per year; and • Installation and use of LED lighting in all internally lit signage.
▪ **Appliance Energy Efficiency Standards in Place and in Progress** Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	***Compliant.*** Appliances that are purchased for the project will be consistent with existing energy efficiency standards.
Business Transportation and Housing	
▪ **Measures to Improve Transportation Energy Efficiency** Builds on current efforts to provide a framework for expanded and new initiatives including incentives, tools and information that advance cleaner transportation and reduce climate change emissions.	***Compliant.*** The proposed project promotes fuel conservation through Transportation Energy Efficiency design features as identified in Mitigation 4.3.2A, which promote pedestrian traffic and programs which encourage employee carpooling and public transportation use.
▪ **Smart Land Use and Intelligent Transportation Systems (ITS)** Smart land use strategies encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors. ITS is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services. Governor Schwarzenegger is finalizing a comprehensive 10-year strategic growth plan with the intent of developing ways to promote, through state investments, incentives and technical assistance, land use, and technology strategies that provide for a prosperous economy, social equity, and a quality environment. Smart land use, demand management, ITS, and	***Compliant.*** Smart land use strategies "encourage jobs/housing Transportation Systems (ITS) proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors" (CA 2006). The proposed project locates commercial next to residential land uses, which can be considered smart land use. ITS is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services (CA 2006). The proposed project provides goods to those located near the project site thereby improving the efficiency of goods movement.

Table 4.3.R ~~4.3-Q~~ Project Compliance with Greenhouse Gas Emission Reduction Strategies

Strategy	Project Compliance with Mitigation
value pricing are critical elements in this plan for improving mobility and transportation efficiency. Specific strategies include: promoting jobs/housing proximity and transit-oriented development; encouraging high density residential/commercial development along transit/rail corridor; valuing and congestion pricing; implementing intelligent transportation systems, traveler information/traffic control, incident management; accelerating the development of broadband infrastructure; and comprehensive, integrated, multimodal/intermodal transportation planning.	
State and Consumer Services Agency	
▪ **Green Buildings Initiative** Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels. The Executive Order and related action plan spell out specific actions state agencies are to take with state-owned and –leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20 percent target.	***Compliant.*** As discussed above, the project is initiating energy efficiency measures 10 percent beyond what is required by Title 24. In addition, 2005 Title 24 amendments are *8.5* percent more efficient than those in 2001.
Department of Water Resources	
▪ **Water Use Efficiency** Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.	***Compliant.*** The project is required to comply with the High Desert Water District water conservation measures including use of drought tolerant plants in landscaping and use of plumbing fixtures that reduce water consumption (HDWD Ordinance No. 038). The Wal-Mart Supercenter will use sensor activated low-flow faucets in all bathrooms which reduce water usage by 84%. The use of low-flow faucets and toilets are encouraged by the HDWD (HDWD Ordinance No. 038).

Level of Significance after Mitigation. The discussion identifies and qualitatively analyzes various reduction measures and programs designed to reduce GHG gases to the extent possible. Although implementation of the above stated measures may reduce the emission of green house gases attributable to the project through vehicle emission reductions, vehicular trip reductions, HFC emission reductions, recycling programs, increases in building and appliance energy efficiencies, and decreased water use, it is not possible to specifically quantify the reduction in green house gases that will result from implementation of the strategies and programs described above. However, the project is consistent with the strategies to reduce California's emissions to the levels proposed by Executive

Order S-3-05. Therefore, the project's incremental contribution to climate change impacts is less than significant.

4.3.5 Cumulative Impacts

Based on these conditions, the region is currently designated as "nonattainment" under State and federal ozone ambient air quality standards and also under PM_{10} ambient air quality standards. It was determined that the project would exceed the MDAQMD significance threshold for NOx and PM_{10} emissions during construction and the ROC, NOx, and PM_{10} emissions thresholds during project operations. As the volume of emissions that will result from the construction and operation of the proposed project contribute towards the creation of basin-wide O_3 and PM_{10} levels, the development of the proposed supercenter constitutes significant cumulative and project-level impacts. The project's SOx emissions during construction and operations are not considered to be cumulatively considerable because they are less than the MDAQMD's emission threshold and the air basin has long been in attainment for SOx.

The proposed project would contribute 0.0343 Tg CO_2 Eq, which is 0.007 percent of California's 2004 total emissions for carbon dioxide, methane, and nitrous oxide (492 Tg CO_2 Eq). However, with implementation of the strategies and programs described in Table 4.3.R ~~4.3-Q~~, the project is consistent with the strategies to reduce California's emissions to the levels proposed in Executive Order S-3-05. Inherently, the issue of climate change is cumulative in nature. Therefore, although the project would contribute some GHG to existing conditions, its contribution to climate change is cumulatively less than significant.

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