4.3 AIR QUALITY

This section includes a description of existing air quality, a summary of applicable regulations, and analyses of potential short-term and long-term air quality impacts of the proposed project. The methods of analysis for short-term construction, long-term regional (operational), local mobile source, odor, and toxic air contaminant (TAC) emissions are consistent with the recommendations of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

4.3.1 ENVIRONMENTAL SETTING

The project site is located in San Joaquin County, which is within the San Joaquin Valley Air Basin (SJVAB). The SJVAB also comprises all of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and the valley portion of Kern County. Ambient concentrations of air pollutants are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors which affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The SJVAB, which occupies the southern half of the Central Valley, is approximately 250 miles long and, on average, 35 miles wide. The SJVAB is a well-defined climatic region with distinct topographic features on three sides. The Coast Range, which has an average elevation of 3,000 feet, is located on the western border of the SJVAB. The San Emigdio Mountains, which are part of the Coast Range, and the Tehachapi Mountains, which are part of the Sierra Nevada, are both located on the south side of the SJVAB. The Sierra Nevada forms the eastern border of the SJVAB. The northernmost portion of the SJVAB is San Joaquin County. There is no topographic feature delineating the northern edge of the basin. The SJVAB can be considered a "bowl" open only to the north.

The SJVAB is basically flat with a downward gradient in terrain to the northwest. Air flows into the SJVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin Delta (Delta) from the San Francisco Bay Area. The mountains surrounding the SJVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution. As a result, the SJVAB is highly susceptible to pollutant accumulation over time.

The inland Mediterranean climate type of the SJVAB is characterized by hot, dry summers and cool, rainy winters. The climate is a result of the topography and the strength and location of a semipermanent, subtropical high-pressure cell. During summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwellings of cold ocean water from below to the surface, because of the northwesterly flow, produce a band of cold water off the California coast. Daily summer high temperatures often exceed 100ºF, averaging in the low 90s in the north and high 90s in the south. In the entire SJVAB, daily summer high temperatures average 95ºF. Over the last 30 years, temperatures in the SJVAB averaged 90ºF or higher for 106 days a year, and 100ºF or higher for 40 days a year. The daily summer temperature variation can be as high as 30ºF (SJVAPCD 2002). In winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and storms. Average high temperatures in the winter are in the 50s, but lows in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature in the winter is 45ºF (SJVAPCD 2002).

A majority of the precipitation in the SJVAB occurs as rainfall during winter storms. The rare occurrence of precipitation during the summer is in the form of convective rain showers. The amount of precipitation in the SJVAB decreases from north to south primarily because the Pacific storm track often passes through the northern portion of the SJVAB, while the southern portion remains protected by the Pacific high-pressure cell. Stockton in the north receives about 20 inches of precipitation per year, Fresno in the center receives about 10 inches per year, and Bakersfield at the southern end of the valley receives less than 6 inches per year. Average annual rainfall for the entire SJVAB is approximately 9.25 inches on the valley floor (SJVAPCD 2002).

Summer is considered the ozone season in the SJVAB. This season is characterized by poor air movement in the mornings and by longer daylight hours, which provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and NO_X, which result in ozone formation. During the summer, wind speed and direction data indicate that summer wind usually originates at the north end of the San Joaquin Valley and flows in a south-southeasterly direction through Tehachapi Pass and into the Southeast Desert Air Basin (SJVAPCD 2002).

EXISTING AIR QUALITY CONDITIONS—CRITERIA AIR POLLUTANTS

Concentrations of the following air pollutants: ozone, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health, and because there is extensive documentation available on health-effects criteria for these pollutants, they are commonly referred to as “criteria air pollutants.”

A brief description of each criteria air pollutant, including source types, health effects, and future trends, is provided below along with the most current attainment area designations and monitoring data for the project area and vicinity.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels. A highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional scale, ozone is a regional pollutant.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 part per million (ppm) for 1–2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes (the amount of air inhaled and exhaled), and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in permeability of respiratory epithelia; such increased permeability leads to an increased response of the respiratory system to challenges, and a decrease in the immune system's ability to defend against infection (Godish 2004).

Emissions of ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. The ozone problem in the SJVAB ranks among the most severe in the state. Peak levels have not declined as much as the number of days that standards are exceeded has declined. From 1990 to 2006, the maximum peak 8-hour indicator decreased by 6%. The number of State and national 8-hour exceedance days has declined by 16% and 23% respectively. Most of this progress has occurred since 2003. However, the number of exceedance days in 2005 and 2006 were among the lowest in this 17-year period (ARB 2007a). Data from 2005 showing the trend in 3-year averages of 8-hour ozone data indicates that most of San Joaquin County now attains the federal 8-hour ozone standard (ARB2007a).

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2007a).

The highest concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to problems caused by ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (EPA 2007a). The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions (EPA 2007a).

Sulfur Dioxide

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist, mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (EPA 2007a). Fine particulate matter ($PM_{2.5}$) is a subgroup of PM_{10}, consisting of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (ARB 2007a).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAH), and other toxic substances adsorbed onto fine particulate matter (referred to as the “piggybacking effect”), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (EPA 2007a). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of PM_{10} remained relatively unchanged between 1975 and 2005 and are projected to remain unchanged through 2020. PM_{10} emissions in the SJVAB are dominated by emissions from areawide sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, waste burning, and residential fuel combustion. Annual average (national) PM2.5 concentrations in the San Joaquin Valley Air Basin show a definite downward trend from 1999 through 2005. The State annual average concentrations remained relatively constant from 1999 through 2005, with a slight drop in 2004. The differences in trends are due to differences in State and national monitoring methods. $PM_{2.5}$ emissions in the SJVAB are dominated by emissions from the same areawide sources as PM_{10} (ARB 2007a).

Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. Environmental Protection Agency (EPA) set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995 (EPA 2007a).

As a result of EPA’s regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions.

A National Health and Nutrition Examination Survey reported a 78% decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (EPA 2007a).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story with regard to air quality management. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent California Air Resources Board (ARB) regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a TAC.

Monitoring Station Data and Attainment Area Designations

Criteria air pollutant concentrations are measured at several monitoring stations in the SJVAB. There are three stations in San Joaquin County, two in Stockton and one in Tracy. The Hazelton Street station in Stockton, approximately 11 miles north of the project site measures ozone, NO_2, PM_{10}, and $PM_{2.5}$. Table 4.3-1 summarizes the air quality data from this station for the most recent 3 years, 2004 through 2006. For local concentrations, the data is not necessarily representative of the project site, because of the distance from the monitor to the site.

Both ARB and the U.S. Environmental Protection Agency (EPA) use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations for the San Joaquin County portion of the SJVAB are shown in Table 4.3-2 for each criteria air pollutant. On July 6, 2006, the EPA proposed redesignation for the SJVAB as a PM_{10} attainment area, based on the attainment of the national standard in the 2003 through 2005 period. EPA finalized approval of the attainment designation on October 17, 2006 (SJVAPCD 2007a). Formal designation to attainment has not occurred as of October 2007, pending completion of appropriate documentation (EPA 2007b, SJVAPCD 2007a).

Existing Emissions

The existing project site is a fallow agricultural field. Irrigation control structures run east and west along the southern border of the site and an irrigation well and pump is located at the site's western edge. In the past, the site was used for agricultural row crop production. Current emissions of criteria air pollutants and precursors from the site are negligible.

With respect to San Joaquin County, mobile sources are the largest contributor to the estimated annual average air pollutant levels of ROG, CO, and NO_x accounting for approximately 56%, 88%, and 83%, respectively, of the total emissions. Areawide sources account for approximately 79%, and 54% of the County's PM_{10} and $PM_{2.5}$ emissions, respectively. Stationary sources account for approximately 78% of the County's oxides of sulfur (SO_x) emissions (ARB 2007h).

Table 4.3-1 Summary of Annual Ambient Air Quality Data (2004–2006) – Hazelton Station			
	2004	2005	2006
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.096/0.080	0.099/0.086	0.109/0.092
Number of days state standard exceeded (1-hr)	1	3	-
Number of days national standard exceeded (1-hr/8-hr)	0/0	0/1	0/2
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hr, ppm)	0.079	0.087	0.072
Number of days state standard exceeded (1-hr)	0	0	0
Annual Average (ppm)	0.017	0.017	0.018
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration ($\mu g/m^3$) National/California[1]	41/41	63/70	47/-
Number of days national standard exceeded (measured[2])	0	0	0
State annual average ($\mu g/m^3$)	13.2[3]	12.5	13.1
Respirable Particulate Matter (PM_{10})			
Maximum concentration ($\mu g/m^3$)	176/61	79/84	52/-
Number of days state standard exceeded (calculated[2])	18	46	-
Number of days national standard exceeded (calculated[2])	1	0	0
Carbon Monoxide (CO)			
Maximum concentration (1-hr/8-hr, ppm)	3.7/2.5	3.6/2.3	4.4/2.3
Number of days state standard exceeded (1-hr)	0	0	0
Number of days national standard exceeded (1-hr/8-hr)	0/0	0/0	0/0

Where,
ppm = parts per million; µg/m3 = micrograms per cubic meter; - = data not available
[1] State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State statistics are based on local conditions National statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[2] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.
[3] The state annual standard was exceeded in each year.
Sources: California Air Resources Board 2007b; EPA 2007c

Table 4.3-2
Ambient Air Quality Standards and San Joaquin County Attainment Status Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Severe)	-	-	-
	8-hour	0.07 ppm[8] (137 µg/m^3)	–	0.08 ppm (157 µg/m^3)	Same as Primary Standard	N(Serious) [9]
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A[11]	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)[15]	Annual Arithmetic Mean	0.03 ppm (56 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean 24-hour	20 µg/m^3 50 µg/m^3	N	– 150 µg/m^3	Same as Primary Standard	N(Serious)[12]
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean 24-hour	12 µg/m^3 –	N –	15 µg/m^3 35 µg/m^3 [14]	Same as Primary Standard	N[13]
Lead[10]	30-day Average	1.5 µg/m^3	U	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	

Table 4.3-2 (Continued)
Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Sulfates	24-hour	25 µg/m³	A		**No National Standards**	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m³)	U			
Vinyl Chloride[10]	24-hour	0.01 ppm (26 µg/m³)	U/A			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer —visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter (µg/m³)]. 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.

[4] Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

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

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

[7] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] This concentration effective May 17, 2006.

[9] On April 30, 2007 the Governing Board of the San Joaquin Valley Air Pollution Control District voted to request EPA to reclassify the San Joaquin Valley Air Basin as extreme nonattainment for the federal 8-hour ozone standards. The California Air Resources Board, on June 14, 2007, approved this request. This request must be forwarded to EPA by the California Air Resources Board and would become effective upon EPA final rulemaking after a notice and comment process; it is not yet in effect.

[10] ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold 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.

[11] Designation for San Joaquin County; the designation is different for one or more other counties in the SJVAB

[12] On October 17, 2006, the EPA approved a finding of PM_{10} attainment; however, the formal redesignation had not occurred by October 2007, pending additional documentation

[13] The Valley is designated nonattainment for the 1997 $PM_{2.5}$ federal standards. EPA designations for the 2006 $PM_{2.5}$ standards will be finalized in December 2009. The District has determined, as of the 2004-06 $PM_{2.5}$ data, that the Valley has attained the 1997 24-Hour $PM_{2.5}$ standard.

[14] The 24-hour standard for $PM_{2.5}$ has been reduced from 65 µg/m³ to 35 µg/m³, effective December 18, 2006.

[15] The CAAQS were amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

Sources: San Joaquin Valley Air Pollution Control District 2007b, 2007c; California Air Resources Board 2007c, 2007d

EXISTING AIR QUALITY CONDITIONS—TOXIC AIR CONTAMINANTS

Concentrations of TACs, or in federal parlance, hazardous air pollutants (HAPs), are also used as indicators of ambient-air-quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (ARB 2007a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in the SJVAB in 2000 to be 390 excess cancer cases per million people. Since 1990, the health risk of diesel PM in the SJVAB has been reduced by 50%. Overall, levels of most TACs have gone down since 1990 except for para-dichlorobenzene and formaldehyde, (ARB 2007a).

According to ARB Community Health Air Pollution Information System, there are no major existing stationary sources of TACs within two miles of the project site (ARB 2007e). Vehicles on SR 120, Airport Way, and Daniels Street are sources of diesel PM and other TACs associated with vehicle exhaust.

EXISTING AIR QUALITY CONDITIONS—ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

There are no notable sources of disagreeable odors in the vicinity of the project site.

EXISTING AIR QUALITY – GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE

Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases (GHG), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. The earth emits this radiation, which was initially absorbed, back to space, but the properties of the radiation have changed from high-frequency solar radiation to lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. Without the Greenhouse Effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the Greenhouse Effect are carbon dioxide (CO_2), methane (CH_4), ozone, nitrous oxide (N_2O), water vapor, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs (with the exception of water vapor) in excess of natural ambient concentrations are responsible for intensifying the Greenhouse Effect and have led to a trend of warming of the earth's climate, known as global climate change or global warming (Ahrens 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (CEC 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006a). Emissions of CO_2 are byproducts of fossil fuel combustion, and are the largest portion of human-caused GHG emissions by mass. Methane, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) associated with agricultural practices and landfills. CO_2 sinks, or reservoirs, include sequestration by vegetation or dissolution into the ocean, among other processes.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006a). California produced 492 million gross metric tonnes of carbon dioxide equivalent (CO_2e) in 2004 (CEC 2006a). CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the Greenhouse Effect. This potential, known as the global warming potential of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation References," of the General Reporting Protocol of the California Climate Action Registry (2007), 1 ton of CH_4 has the same contribution to the Greenhouse Effect as approximately 21 tons of CO_2. Therefore, CH_4 is a much more potent GHG than CO_2. Expressing emissions in CO_2e takes into account the contributions of all GHG emissions to the Greenhouse Effect and converts them to a single unit equivalent of the effect that would occur if only CO_2 were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 41% of total GHG emissions in the state (CEC 2006a). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (22%) and the industrial sector (21%) (CEC 2006a).

According to the Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3–7°F by the end of the century, depending on future GHG emission scenarios (IPCC 2007). Resource areas other than air quality and atmospheric temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to the CEC (2006b), the snowpack portion of the water supply could potentially decline by 30–90% by the end of the 21st century. A study cited in a report by the California Department of Water Resources (DWR) projects that approximately 50% of the statewide snowpack will be lost by the end of the century (Knowles and Cayan 2002). Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. An increase in precipitation falling as rain rather than snow could also lead to increased potential for floods because water that would normally be held in the Sierra Nevada snowpack until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system (DWR 2006).

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century (CEC 2006b), and it is predicted to rise an additional 7–22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2007). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion (especially a concern in the low-lying Sacramento–San Joaquin River Delta, where pumps delivering potable water could be threatened), and disruption of wetlands (CEC 2006b). As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available.

4.3.2 REGULATORY SETTING

Air quality within San Joaquin County is regulated by EPA, ARB, SJVAPCD, San Joaquin County, and the City of Manteca. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

Federal Plans, Policies, Regulations, and Laws

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish NAAQS. As shown in Table 4.3-2, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA must review all state SIPs to determine whether they conform to the mandates of the CAA and the amendments thereof, and to determine whether implementing them will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may cause sanctions to be applied to transportation funding and stationary air pollution sources in the air basin.

State Plans, Policies, Regulations, and Laws

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish CAAQS (Table 4.3-2). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

Local Plans, Policies, Regulations, and Ordinances

San Joaquin Valley Air Pollution Control District

SJVAPCD seeks to improve air quality conditions in San Joaquin County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of SJVAPCD includes preparing plans and programs for the attainment of ambient air quality standards, adopting and enforcing rules and regulations, and issuing permits for stationary sources. SJVAPCD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA, CAAA, and CCAA.

In January 2002, SJVAPCD released a revision to the previously adopted guidelines document. This revised *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAI) (SJVAPCD 2002) is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The guide contains the following applicable components:

- criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- methods available to mitigate air quality impacts; and
- information for use in air quality assessments that will be updated more frequently such as air quality data, regulatory setting, climate, and topography.

Air Quality Attainment Plans

SJVAPCD prepares and submits Air Quality Attainment Plans (AQAPs) in compliance with the requirements set forth in the CCAA. The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the attainment plans must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. As a nonattainment area, the region is also required to submit rate-of-progress milestone evaluations in accordance with the CAAA. These milestone reports include compliance demonstrations that the requirements have been met for the nonattainment area. The air quality attainment plans and reports present comprehensive strategies to reduce emissions of ROG, NO_X, and PM_{10} from stationary, area, mobile, and indirect sources. Such strategies include the adoption of rules and regulations; enhancement of CEQA participation; implementation of a new and modified indirect-source review program; adoption of local air quality plans; and stationary-, mobile-, and indirect-source control measures. Table 4.3-3 summarizes SJVAPCD's current AQAPs.

Table 4.3-3
Summary of San Joaquin Valley Air Pollution Control District Air Quality Plans

Pollutant	Plan Title	Date	Status
Ozone	*Extreme Ozone Attainment Demonstration Plan, San Joaquin Valley Air Basin Plan Demonstrating Attainment of Federal 1-Hour Ozone Standards*	October 2004, Amended October 2005	Adopted by SJVAPCD and ARB in October 2004. Submitted to EPA in November 2004[1].
	Draft Staff Report, 8-Hour Ozone Reasonably Available Control Technology—State Implementation Plan (RACT SIP) Analysis	April 2006	Adopted by SJVAPCD in August 17, 2006.
	8-Hour Ozone Attainment Demonstration Plan for the San Joaquin Valley	April 2007	Adopted by SJVAPCD in April 2007. Submitted to ARB in June 2007. Ongoing efforts to strengthen the SIP; next report to ARB, November 2007
Carbon Monoxide (CO)	*2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for the Federal Planning Areas*	July 2004	Adopted by ARB July 2004.
Respirable and Fine Particulate Matter (PM_{10} and $PM_{2.5}$)	*2007 PM10 Maintenance Plan and Request for Redesignation*	September 2007	Adopted by SJVAPCD September 20, 2007. Submitted to ARB.
	$PM_{2.5}$ Plan	-	In progress. Due to EPA April 2008.
	Natural Events Action Plan for High Wind Events in the San Joaquin Valley	February 2006	Adopted by SJVAPCD February 2006. Submitted to ARB.

Notes:
[1] Effective June 15, 2005, EPA revoked in full the national 1-hour ozone ambient air quality standard, including associated designations and classifications.
ARB = California Air Resources Board
EPA = U.S. Environmental Protection Agency
SJVAPCD = San Joaquin Valley Air Pollution Control District
Source: SJVAPCD 2007d; ARB 2007f, 2007g

Rules and Regulations

As mentioned above, SJVAPCD adopts rules and regulations. All projects are subject to SJVAPCD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include, but are not limited to:

- Regulation VIII—Fugitive Dust PM_{10} Prohibitions

Rules 8011–8081 are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, and landfill operations. Compliance with Regulation VIII is mandatory, and compliance by the Applicant is assumed in this analysis.

If a nonresidential project is 5.0 or more acres in area, a Dust Control Plan must be submitted as specified in Section 6.3.1.of Rule 8021. Therefore, the Applicant is required to submit a Dust Control Plan. Construction activities shall not commence until SJVAPCD has approved the Dust Control Plan.

- Rule 2010—Permits Required

This rule applies to any person who plans to or does operate, construct, alter, or replace any source operation, which may emit air contaminants or may reduce the emission of air contaminants. This project, or portions thereof, may be subject to SJVAPCD permitting requirements. If SJVAPCD permits are required, permit applications should be submitted to the District as soon as possible to avoid delays in the project.

- Rule 2201—New and Modified Stationary Source Review Rule

This rule applies to all new stationary sources and all modifications of existing stationary sources. They are subject to SJVAPCD permit requirements if, after construction, they emit or may emit one or more affected pollutant.

- Rule 3135—Dust Control Plan Fee

This rule requires the applicant to submit a fee in addition to a Dust Control Plan. The purpose of this fee is to recover SJVAPCD's cost for reviewing such plans and conducting compliance inspections.

- Rule 4101—Visible Emissions

This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.

- Rule 4102—Nuisance

This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that such emissions create a public nuisance, the owner/operator could be in violation and be subject to SJVAPCD enforcement action.

- Rule 4601—Architectural Coatings

This rule limits volatile organic compounds from architectural coatings by specifying architectural coatings storage, clean up, and labeling requirements.

- Rule 4641—Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations

This rule applies to the manufacture and use of the aforementioned asphalt types for paving and maintenance operations.

- Rule 9510—Indirect Source Review

This rule was adopted to reduce the impacts of growth in emissions from all new development in the San Joaquin Valley. The purposes of Rule 9510 are to (1) fulfill SJVAPCD's emission reduction commitments in the PM_{10} and Ozone Attainment Plans, (2) Achieve emission reductions from the construction and use of development projects through design features and on-site measures, and (3) Provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures.

The rule is applicable to any applicant (any person or entity that undertakes a development project), which upon full build out for retail/commercial uses is 2,000 square feet or more. Therefore, the rule is applicable to the proposed project.

Rule 9510 requires applicants subject to the rule to provide information that enables SJVAPCD to quantify construction, area and operations NO_x and exhaust PM_{10} emissions. Rule 9510 requires construction exhaust emissions to be reduced by 20% for NO_x and 45% for PM_{10} when compared to the statewide fleet average. For operations, emissions of NO_x must be reduced by 33.3% and emissions of exhaust PM_{10} must be reduced by 50%; the operations emissions reductions may occur over a period of ten years. Both construction and operations emissions reductions may be achieved by on-site measures or by payment of an off-site fee, or a combination of both methods. However, if the initial emissions calculation shows that emissions would be less than 2 tons per year of NO_x or exhaust PM_{10}, then emission reduction measures are not required.

On site measures for mitigation of construction emissions may include the use of cleaner fuels, retrofit equipment on engines and exhaust system, and the use of new, low-emissions engine types. Measures to reduce operations emission include building designs for energy efficiency and site designs and procedures to reduce trip generation.

City of Manteca

City of Manteca General Plan

The City of Manteca's General Plan 2023, adopted in October 2003, includes an air quality element (Manteca 2003). The following policies and implementation measures are applicable to the proposed project:

- Implementation: Air Quality- Land Use
    - AQ-I-5. Locate employment, school, and daily shopping destinations near residential areas.
- Policies: Air Quality- Dust and Other Airborne Particulate Materials
    - AQ-P-7: New construction will be managed to minimize fugitive dust and construction vehicle emissions

- Implementation: Air Quality- Dust and Other Airborne Particulate Materials

  - AQ-I-12. Construction activity plans shall include and/or provide for a dust management plan to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard.

    - Project development applicants shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of project development and construction.

- Implementation: Air Quality- Reduce Emissions From Energy Generating Facilities

  - AQ-I-15. Design review criteria shall include the following considerations, at a minimum:

    - The use of energy efficient lighting (including controls) and process systems beyond Title 24 requirements shall be encouraged where practicable (e.g., water heating, furnaces, boiler units, etc.)

    - The use of energy efficient automated controls for air conditioning beyond Title 24 requirements shall be encouraged where practicable.

    - Promote solar access through building siting to maximize natural heating and cooling, and landscaping to aid passive cooling and to protect from winds.

City of Manteca Municipal Code

The purpose of Chapter 17.13 of the City of Manteca Municipal Code, Performance Standards, is to provide necessary control measures to protect the community from hazards and nuisances and to establish limits and procedures for measuring the nuisances. The general statement of the section is, "Land or buildings shall not be used or occupied in a manner creating any dangerous injurious, noxious, fire, explosive or other hazard; noise, vibration, smoke, dust, order or form of air pollution; heat, cold, dampness, electrical or other disturbance; glare, refuse or wastes; other substances, conditions or elements which would adversely affect the surrounding area" (City of Manteca 1992).

With respect to air quality, Section 17.13.040G specifies, "Smoke, Fumes, Gasses, Dust, Particulate Matter. No emission shall be permitted at any point which would violate current regulations for such emission as established by federal and state air quality standards." Section 17.13.040G specifies that no emission of odors shall be permitted in such quantities as to be readily detectable when diluted in the ratio of one volume of odorous air to four volumes of clean air. Any process which may involve the creation or emission of any odors shall be provided with a secondary safeguard system, so that control will be maintained if the primary safeguard system should fail.

Toxic Air Contaminants

Air quality regulations also focus on TACs. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 4.3-2). Instead, EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by SJVAPCD establish the regulatory framework for TACs.

Federal Hazardous Air Pollutant Programs

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any HAP or more than 25 tpy of any combination of HAPs; all other sources are considered area sources. The CAAA called on EPA to promulgate emissions standards in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

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

State and Local Toxic Air Contaminant Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel-exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for 1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; 2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and 3) reporting requirements, under which transit agencies must demonstrate compliance with the public-transit bus fleet rule. Current and future milestones include the low-sulfur diesel fuel requirement and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year-2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

ARB published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land use compatibility with TAC sources (ARB 2005). While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries dry cleaners, gasoline stations, and industrial facilities, to help keep children and other sensitive populations out of harm's way. A number of comments on the handbook were provided to ARB by air districts, other agencies, real estate representatives, and others. The comments included concern over whether ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under SJVAPCD Regulations II and VII, all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source review standards and air toxics control measures. SJVAPCD limits emissions and public exposure to TACs through a number of programs. SJVAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by SJVAPCD (e.g., health risk assessment) on the basis of their potential to emit toxics. If it is determined that the project would emit toxics in excess of SJVAPCD's threshold of significance for TACs, as identified below, sources must implement the best available control technology for TACs (T-BACT) to reduce emissions. If a source cannot reduce the risk below the threshold of significance, even after T-BACT has been implemented, SJVAPCD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that SJVAPCD's air quality permitting process applies to stationary sources; properties that are exposed to elevated levels of nonstationary type sources of TACs, and the nonstationary type sources themselves (e.g., on-road vehicles), are not subject to air quality permits. Further, for reasons of feasibility and practicality, mobile sources (cars, trucks, etc.) are not required to implement T-BACT, even if they do have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the federal and state levels.

Odors

SJVAPCD has determined some common types of facilities that have been known to produce odors, including wastewater treatment facilities, chemical manufacturing plants, painting/coating operations, feed lots/ dairies, composting facilities, landfills, and transfer stations. Any actions related to odors are based on citizen complaints to local governments and SJVAPCD. According to SJVAPCD, significant odor problems occur when there is more than one confirmed complaint per year averaged over a 3-year period or when there are three unconfirmed complaints per year averaged over a 3-year period (SJVAPCD 2002).

Two situations increase the potential for odor problems. The first occurs when a new odor source is located near existing sensitive receptors. The second occurs when new sensitive receptors are developed near existing sources of odor. In the first situation, SJVAPCD recommends operational changes, add-on controls, process changes, or buffer zones where feasible to address odor complaints. In the second situation, the potential conflict is considered significant if the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. For projects locating near a source of odors where there is no nearby development that may have filed complaints, and for odor sources locating near existing sensitive receptors, SJVAPCD requires the determination of potential conflict to be based on the distance and frequency at which odor complaints from the public have occurred in the vicinity of a similar facility (SJVAPCD 2002). SJVAPCD has adopted Rule 4102, as identified above, that applies to odor emissions. In addition, San Joaquin County Ordinance 9-1025.4 (Odor) and the City of Manteca Ordinance 17.13.040G and 17.13,030 apply to odor emissions.

GREENHOUSE GAS EMISSIONS

There are no federal laws, regulations, or policies pertaining to GHG emissions.

Assembly Bill 32, the California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed assembly bill (AB) 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Senate bill (SB) 97 recognizes that CEQA analysis of greenhouse gas emissions is necessary and requires the State Office of Planning and Research to develop CEQA guidelines for mitigation of GHG emissions or the effects of GHG emissions by July 1, 2009, and that the guidelines be adopted by January 1, 2010.

There are no local laws, regulations, or policies pertaining to GHG emissions.

4.3.3 ENVIRONMENTAL IMPACTS

ANALYSIS METHODOLOGY

Project-generated construction-related emissions of criteria air pollutants (e.g., PM_{10}) and ozone precursors (ROG and NO_X) were assessed in accordance with SJVAPCD-recommended methodologies from the following: SJVAPCD's GAMAQI, (SJVAPCD 2002), a comment letter submitted by SJVAPCD for the proposed project (SJVAPCD 2007b), and SJVAPCD's web site (SJVAPCD 2007a). Construction and operations-related emissions of ROG and NO_X were modeled using URBEMIS2007 Version 9.2.2 (Rimpo and Associates 2007). Construction-related emissions of fugitive dust and PM_{10} were qualitatively assessed in accordance with SJVAPCD recommendations. Traffic data for construction and site operations were provided by the applicants. Long-term traffic generation for the proposed project was developed by Fehr & Peers, traffic engineers; the data is included in Section 4.11, "Transportation and Traffic," of this DEIR. Determinations of significance for short-term construction and long-term operation regional emissions were based on the comparison of project-generated emissions to SJVAPCD thresholds.

The potential for local CO impacts was evaluated in accordance with SJVAPCD guidance and a screening methodology developed by the Sacramento Metropolitan Air Quality Management District.

At this time, SJVAPCD has not adopted a methodology for analyzing short-term construction-related emissions of TACs and does not recommended the completion of health risk assessments (HRAs) for such emissions, with a few exceptions (e.g., where construction phase is the only phase of project) (Reed, pers. comm., 2007). Therefore, project-generated, construction-related emissions of TACs were assessed in a qualitative manner. For long-term exposure to TACs, a HRA was prepared in accordance with SVAPCD Guidance for Air Dispersion Modeling, (SJVAPCD 2006), the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2003) and similar references. HRA methodology is further described in Impact 4.3-3 below and Appendix G to this EIR.

Project-generated construction-related emissions of GHGs were calculated using URBEMIS2007. Operation-related emissions of GHGs were also calculated using URBEMIS and the methodologies established by the California Climate Acton Registry (CCAR 2007).

THRESHOLDS OF SIGNIFICANCE

For the purpose of this analysis, the following thresholds of significance, as identified by the State CEQA Guidelines (Appendix G) and SJVAPCD (SJVAPCD 2002), have been used to determine whether implementation of the proposed project would result in significant air quality impacts.

Based on Appendix G of the State CEQA Guidelines, an air quality impact is considered significant if implementation of the proposed project would do any of the following:

- 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 NAAQS or CAAQS (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 or people.

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Thus, as contained in the GAMAQI (SJVAPCD 2002), implementation of the proposed project would result in significant air quality impacts if:

- SJVAPCD-recommended control measures beyond compliance with Regulation VIII-Fugitive Dust Prohibition are not incorporated into project design or implemented during project construction;
- Short-term construction-related emissions of ROG or NO_X exceed the SJVAPCD-recommended mass emissions threshold of 10 tons per year (TPY);
- Long-term operational (regional) emissions of ROG or NO_X exceed the SJVAPCD-recommended mass emissions threshold of 10 TPY;
- Local mobile-source emissions of CO violate or contribute substantially to a violation of the NAAQS or CAAQS;

- exposure of sensitive receptors to a substantial incremental increase in TAC emissions (e.g., stationary or mobile-source) that result in excess cancer risk greater than 10 in one million for or a hazard Index (HI) greater than 1 for noncancer risk at the Maximally Exposed Individual (MEI); or

- sensitive receptors would be located near an existing odor source where one confirmed complaint per year averaged over a three year period, or three unconfirmed complaints per year averaged over a three year period has been experienced by existing receptors as close as the project to the odor source; or by existing receptors in the vicinity of a similar facility considering distance, frequency, and odor control, where there is currently no nearby development and for proposed odor sources near existing receptors.

With regard to emissions of GHGs, neither the SJVAPCD nor any other air district in California, has identified a significance threshold for project-generated emissions or a methodology for analyzing air quality impacts related to global warming. Though, by adoption of AB 32, California has identified that global climate change is a serious environmental issue, and has identified GHG reduction goals. Therefore, the City of Manteca, for this project only, has established the following thresholds of significance:

A significant direct impact to global warming would occur if project CO_2e emissions exceed 25,000 metric tons per year. This criterion is based upon the limits set by the ARB working group that is preparing the regulation that will specify GHG calculation, reporting, and verification requirements for the specific industrial sectors in California. Industries with less than 25,000 metric tons of CO_2 emissions are not being considered.

IMPACT ANALYSIS

IMPACT 4.3-1	Generation of Short-term Construction-Related Emissions of Criteria Air Pollutants and Precursors. *Modeled short-term project-generated ozone precursor emissions from construction equipment for Phase 1 and Phase 2 of the proposed project would not exceed SJVAPCD's significance thresholds of 10 tpy; emissions of ozone precursors would be* ***less than significant****. Feasible dust control measures beyond those required by SJVAPCD Regulation VIII are not currently part of the project description. Project-generated, construction- related emissions of* PM_{10} *could violate or contribute substantially to an existing or projected air quality violation, and/or conflict with air quality planning efforts. As a result, this impact would be* ***significant.***

Construction-related emissions are described as "short-term" or temporary in duration and have the potential to represent a significant impact with respect to air quality, especially fugitive PM_{10} dust emissions. Fugitive PM_{10} dust emissions are primarily associated with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled (VMT) by construction vehicles on- and off-site. Ozone precursor emissions of ROG and NO_X are primarily associated with gas and diesel equipment exhaust and the application of architectural coatings.

Construction-related activities associated with the proposed Stadium Center Phase III would result in project-generated emissions of criteria air pollutants PM_{10}, $PM_{2.5}$, and NO_x and ozone precursors ROG and NO_X from site preparation (e.g., excavation, grading, and clearing); off-road equipment, material transport, and worker commute exhaust emissions; paving; application of architectural coatings; and other miscellaneous activities.

Project-generated, construction-related emissions of criteria air pollutants and precursors were modeled in accordance with SJVAPCD-recommended methodologies (SJVAPCD 2002). Exact project-specific data (e.g., construction equipment types and number requirements, and maximum daily acreage disturbed) were not available at the time of this analysis. Project-generated emissions were modeled based on general information provided in the project description and default and URBEMIS2007 model settings and parameters attributable to the construction period and site location. In order to estimate reasonable worst-case conditions, project-generated emissions were modeled based on the following assumptions:

- Construction of the proposed project is anticipated to occur in two phases; Phase 1 beginning in August 2008 and ending in December 2008; and Phase 2 beginning in January 2009 and ending in December 2009.

- As construction details are not known, it was assumed that 12 acres of the 16-acre site would be graded in Phase 1 and, in case the graded area for Phase 1 was not as large as assumed, 8 acres would be graded during Phase 2.

- Similarly, it was assumed that 8 acres would be paved in Phase 1 and 4 acres would be paved in Phase 2.

- In Phase 1, excavated soil would be moved across the site and stockpiled; therefore, extra equipment was added to the URBEMIS default mix.

Emissions of Ozone Precursors

With respect to ozone precursors, worst-case project-generated, construction-related emissions of ROG and NO_x were modeled using the URBEMIS 2007 Version 9.2.2 computer program. Table 4.3-4 summarizes the modeled emissions for Phase 1 and Phase 2. Construction-related air quality effects were determined by comparing these modeling results with applicable SJVAPCD significance thresholds. Refer to Appendix C for detailed modeling input parameters and results.

Based on the modeling conducted, construction-related activities associated with Phase 1 could result in project-generated emissions of approximately 2.1 tpy of ROG and 1.6 tpy of NO_x, and for Phase 2, 0.6 tpy of ROG and 1.6 tpy of NO_x (Refer to Table 4.3-4). Modeled short-term project-generated emissions from construction equipment for both phases would not exceed SJVAPCD's significance thresholds of 10 tpy. Project-generated emissions of NO_x would not contribute substantially to an existing or projected air quality violation or conflict with air quality planning efforts. As a result, this impact would be **less than significant.**

Table 4.3-4
Summary of Modeled Short-Term Project-Generated Emissions from Construction Equipment (Unmitigated)[a]

Phase/Year	Emissions Tons Per Year			
	ROG	NO_x	PM_{10}[1]	$PM_{2.5}$[1]
Phase 1 Construction , August – December 2008	2.1	1.6	0.1	0.1
Phase 2 Construction, January – December 2009	0.6	1.6	0.1	0.1
SJVAPCD Significance Threshold	10	10	**Note 1**	

[1] SJVAPCD has not identified mass emissions thresholds for construction-related PM_{10} and $PM_{2.5}$ exhaust emissions; data are shown for information only. Fugitive PM_{10} dust emissions are discussed separately below. Refer to Appendix C for detailed assumptions and modeling output files.
[a] Typical construction equipment assumed.
Source: Data modeled by EDAW 2007.

The project applicant would be required to comply with SJVAPCD Rule 9510, as described above. If calculated NO_x and PM_{10} exhaust emissions are less than 2.0 TPY, as estimated in Table 4.3-4, then no construction equipment exhaust emission reduction measures would be required regarding Rule 9510.

Fugitive PM_{10} Dust Emissions

SJVAPCD does not require a quantitative analysis of construction-related fugitive PM_{10} dust emissions and relies on a project's compliance with Regulation VIII (Fugitive Dust Prohibition) and supplemental dust control measures and appropriate to the project. Though the proposed project would be required by law to comply with

Regulation VIII (Fugitive Dust Prohibition), project applicable SJVAPCD-recommended additional control measures are not currently part of the project description. Without these additional measures, the potential emissions of PM_{10} are considered significant by SJVAPCD, and project-generated fugitive PM_{10} dust emissions could violate or contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with air quality planning efforts. As a result, this impact would be **significant.**

Mitigation Measure 4.3-1

The following SJVAPCD-recommended enhanced and additional control measures shall be implemented by the project applicant further reduce fugitive PM_{10} dust emissions.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from adjacent project areas with a slope greater than 1%.
- Limit traffic speeds on unpaved surfaces to 15 miles per hour (mph)
- Suspend excavation and grading activity when winds exceed 20 mph.
- Limit area subject to excavation, grading, and other construction activity at any one time.

Significance after Mitigation

Implementation of Mitigation Measures 4.3-1, along with required compliance with SJVAPCD Regulation VIII would provide the assurance that fugitive dust and PM_{10} emissions would be adequately controlled. As a result, this impact would be reduced to a **less-than-significant** level.

IMPACT 4.3-2	Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Ozone Precursors. *Operation-related activities would result in project-generated emissions of ROG or NO_x that exceed SJVAPCD's significance threshold of 10 tpy. Thus, without mitigation, project-generated, operation-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation or conflict with air quality planning efforts. As a result, this impact would be significant.*

AREA AND MOBILE SOURCE EMISSIONS

Project-generated, regional area and mobile source emissions of ROG, NO_X, and PM_{10} were modeled using the URBEMIS 2007 Version 9.2.2 computer program. URBEMIS allows land use selections that include project location specifics and trip generation rates. URBEMIS accounts for area emissions from the usage of natural gas, landscape maintenance equipment, and consumer products; and mobile sources emissions associated with vehicle trip generation. Regional area- and mobile-source emissions were modeled based on proposed land uses types and sizes as described in Chapter 3, "Project Description" and the trip generation data described in Section 4.11 "Transportation and Circulation. " The trip generation data in Section 4.11 includes data for internal and pass-by trips. Therefore, the net trip generations were used in the model, and the model options for internal trips and pass-by were not used.

Modeled operational emissions are summarized in Table 4.3-5 for 2009, when Phase 1 would be complete, and 2010 when Phase 2 would be complete. As shown in Table 4.3-5, operation-related activities during 2009 would result in project-generated annual unmitigated emissions of ROG and NO_x of less than 10 tpy. In 2010, estimated emissions are 10.1 TPY of ROG, 17.4 TPY of NO_X, and 7.7 TPY of PM_{10}.

Based on the modeling conducted, operation-related activities would result in project-generated emissions of ROG and NO_X that exceed SJVAPCD's applicable thresholds of 10 TPY. Thus, project-generated, operation-related emissions of these ozone precursors could violate or contribute substantially to an existing or projected air quality violation, especially considering the nonattainment status of San Joaquin County for ozone, or conflict with air quality planning efforts. As a result, this would be a **significant** impact.

Table 4.3-5
Summary of Modeled Long- Term Project-Generated, Operation-Related Emissions

Source	Emissions- tons per year (TPY)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
2009 – Completion of Phase 1				
Area Source[2]	0.2	0.3	0.0	0.0
Mobile Source[3]	5.5	8.4	4.0	0.9
Total Unmitigated	5.7	8.7	4.0	0.9
2010 – Completion of Phases 1 and 2				
Area Source[2]	0.2	0.3	0.0	0.0
Mobile Source[3]	9.8	17.1	7.7	1.8
Total Unmitigated	10.1	17.4	7.7	1.8
SJVAPCD Significance Threshold:	10	10	None	

[1] Emissions modeled using the Urbemis2007 (v9.2.2) computer model, based on trip generation rates obtained from the analysis prepared for this project and proposed land uses identified in the project description and traffic analysis.
[2] Area sources used default model assumptions and the areas of each of the project buildings.
[3] Trip generation rates were obtained from the traffic analysis for the project; see Section 4.11.
[4] ISR requires operational emission reductions of 33.3% of NO_X and 50% PM_{10} over a period of 10 years. ISR reductions are required by SJVAPCD rules and are not mitigation measures.
Refer to Appendix C for detailed assumptions and modeling output files.
Source: Data modeled by EDAW 2007.

In the years subsequent to 2010, vehicle emissions will be less, as older vehicles with higher per-vehicle emissions are retired and new, cleaner vehicles come into service. In 2011, ROG emissions for the project are estimated at 9.0 TPY, which is less than the 10 TPY threshold. By 2016, NO_x emissions are forecast to be less than 10 TPY. Therefore, the period of significant impact would last for approximately six years. Compliance with requirements of SJVAPCD Rule 9510 would result in a minimum 33.3% reduction in NO_X emissions and a 50% reduction in PM_{10} over a period of 10 years using either on-site or off-site measures. The rate of reduction can not be estimated at this time.

Stationary Source Emissions

The proposed project would likely include stationary sources of pollutants that would be required to obtain permits to operate under SJVAPCD Rule 2020-Permits Required and Rule 2201-New and Modified Stationary Sources. These sources could include, but not be limited to, a planned diesel-engine generator for emergency power generation; central heating boilers; kitchen equipment at restaurants; and dry cleaning equipment. The permit process would assure that these sources would be equipped with the required emission controls, and that individually, these sources would not cause a significant environmental impact. These sources would not be subject to the ISR rule. Nonetheless, the emissions from these sources would be additive to the estimated area and mobile source emissions described above.

Mitigation Measure 4.3-2a

Mitigation to reduce NO_x emissions addresses reducing the number of motor vehicle trips and reducing the emissions of individual vehicles under control of the Applicant. The following measures shall be implemented by the Applicant unless it can be demonstrated to the City of Manteca that the measures would not be feasible:

(a) The applicant shall require the Stadium Center Operator to operate, maintain, and promote a ride-share program for employees of the various businesses.

(b) The applicant shall include one or more secure bicycle parking areas within the property and encourage bicycle riding for both employees and customers.

(c) The Lowe's Home Improvement Warehouse shall be designed to meet Title 24 + 20% energy efficiency standards and shall include photovoltaic cells on the rooftops to achieve an additional 25% reduction in electricity use on an average sunny day.

(d) The Lowe's Home Improvement Warehouse shall include shower and locker facilities for employees to encourage bicycle, walking, and jogging as options for commuting.

(e) Implement Mitigation Measure 4.11-9, which requires the applicant to coordinate with the City and modify the project designs to provide appropriate bus transit facilities at the project site.

(f) The Applicant shall require that all materials handling equipment operated by the businesses within the facility be electric or use non-diesel engines.

Mitigation Measure 4.3-2b

While area sources comprise a small fraction of the anticipated NO_x emissions, it is the policy of the City of Manteca to require developer to include measures to reduce emissions through energy efficient design. The following measures shall be implemented by the Applicant unless it can be demonstrated to the City of Manteca that the measures would not be feasible:

The Applicant shall include features in the lighting, heating, ventilating, and air conditioning design of each building on the site that will result in energy use at least 20% below Title 24 requirements.

Significance after Mitigation

Implementation of Mitigation Measures 4.3-2a and 4.3-2b would further reduce operations emissions of ROG and NO_X beyond the required compliance with Rule 9510. The results of implementing these measures can not be reasonably quantified. Therefore, the impact would remain **significant and unavoidable.**

IMPACT 4.3-3 Exposure of Sensitive Receptors to Toxic Air Contaminant Emissions. *The project would not expose sensitive receptors to substantial emissions of TACs because construction emissions would be temporary and would rapidly dissipate with distance from the source and proposed operations would not result in the exceedance of the SJVAPCD's screening criteria for project's resulting in significant TAC emissions. As a result, this impact would be* ***less than significant.***

The exposure of sensitive receptors from on-site project-generated construction-related and operation-related sources is discussed separately below.

On-Site Construction-Related Equipment Emissions

Construction-related activities would result in short-term project-generated emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment for site preparation (e.g., excavation, grading, and clearing); paving; application of architectural coatings; and other miscellaneous activities. Diesel PM was identified as a TAC by ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential non-cancer health impacts (ARB 2003). At this time, SJVAPCD has not adopted a methodology for analyzing such impacts and does not recommended the completion of health risk assessments (HRAs) for construction-related emissions of TACs, with a few exceptions (e.g., where construction phase is the only phase of project) (Reed, pers. comm., 2007).

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC to be compared to applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual (MEI.) Thus, the risks estimated for a MEI are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (Salinas, pers. comm., 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002) and further reductions in exhaust emissions, project-generated, construction-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. As a result, this impact would be **less than significant**.

On-Site Operations-Related Stationary Source Emissions

In order to evaluate the potential for significant exposure of persons to TACs, a health risk assessment (HRA) was performed by ENSR in September 2007. The report of the HRA is included in this EIR as Appendix G, and is summarized in this section.

Methodology

The HRA process includes TAC emission estimation, air dispersion analysis, and health risk characterization. The SJVAPCD has developed detailed instructions for completing air quality modeling analysis, documented in the SVAPCD Guidance for Air Dispersion Modeling, (SJVAPCD, 2006). The SJVAPCD Modeling Guidance (Guidance), describes recommended methodology for conducting CEQA health risk assessments and was followed when attributing source release parameters to truck exhaust and for the estimation of diesel-particulate emissions from truck travel and truck idling. Sources of TAC emissions from the project were estimated using emission factors provided in the SJVAPCD Guidance and particulate matter emission standards for various engine classes to quantify facility operations. This HRA used the USEPA-approved AERMOD (Version 07026) dispersion model to determine annual ground-level air concentrations. Results of the air modeling exposure predictions were then applied to the emission estimates and, along with the respective cancer potency factors and chronic and acute noncancer reference exposure levels (RELs) for each TAC, were used to perform a health risk characterization that quantified individual health risks associated with predicted levels of exposure.

In addition to the SJVAPCD Guidance, methods used to assess potential human health risks from the proposed project were obtained from The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2003) (OEHHA Guidance Manual) which describes algorithms, exposure methods, and cancer and noncancer health values needed to perform a HRA.

Sources of TAC emissions

Sources of TAC emissions include diesel-fueled engine and restaurant operations. Delivery truck travel, truck idling, and operation of the emergency back-up power generator are emission sources of particulate matter from diesel-fueled engines. Trucks entering and leaving the Lowe's Center Commercial Development would include deliveries associated with the Lowe's store, the retail stores, and fast-food restaurant. Trucks idling would occur in the Lowe's shipping and receiving delivery dock. Trucks will be limited to an idle time not to exceed 5 minutes for entering or exiting the truck delivery well, in accordance with California State Legislation. The delivery dock is the only location where routine truck idling associated with operation of the Lowe's Center is expected. The fast-food restaurant would emit organic gases from the cooking of animal fats and oils. Emissions would be controlled through to an exhaust manifold (hood) to a roof-top vent. It is not expected that operation of the restaurant will require use of transportation refrigeration storage units (TRU's).

Some small forklifts will be operated primarily inside the distribution center and will run on propane. Emissions from these forklifts would have an insignificant environmental impact due to their small engine size and type. In accordance with the SJVAPCD Modeling Guidance, emissions from vehicles traveling on the roads or highways, are not considered in health risk analysis.

Risk Definitions and Significance

Cancer risk is the probability or chance of contracting cancer over a human life span, which is assumed to be 70 years. Non-cancer health impacts can results from short-term (acute) or long-term (chronic) exposure to chemical substances. In determining potential non-cancer health risks from air toxics, it is assumed that there is a dose of the chemical of concern below which there would be no impact on human health. Non-cancer health risks are measured in terms of a hazard index (HI). The SJVAPCD Modeling Guidance and GAMAQI define significance thresholds for cancer health impacts as equal to or greater than 10 (cases) in a million, and significance thresholds for incremental non-cancer health impacts as equal to or greater than a HI of 1.0.

Results

The HRA evaluated cancer risk and chronic non-cancer health effects at specific nearby locations where people may experience an actual exposure. The HRA evaluated cancer and non-cancer health effects at individual residential, occupational, and sensitive receptors. Health risk impacts were identified at actual locations of residential and occupational receptors within a 1-mile radius of the proposed project site. A summary of maximum cancer risk and non-cancer health impacts values is shown in Table 4.3-6.

Table 4.3-6
Summary of Maximum Health Risks by Receptor Type

Individual Receptor Type	Health Risk Impact[1]	
	Cancer Risk	Non-cancer Chronic (HI)
Maximum Exposed Individual Receptor (MEIR)	2.6	0.0013
Maximum Exposed Individual Worker (MEIW)	0.25	0.00016
Maximum Exposed Individual Child (MEIC)	0.39 [(c)], 0.04 [(w)]	0.000024

[1]Cancer risk shown is total cancer risk, expressed in cases per million, from diesel particulate matter, PAH's and naphthalene. Cancer risk for residential receptor is based on a 70-year exposure. Cancer risk for worker receptors is based on an adjusted worker exposure in accordance with OEHHA and the SJVAPCD Modeling Guidance. Two cancer risk impacts were estimated for the schools. The first cancer risk shown (c) is based on a 9-year student exposure using inhalation and body weight factors developed by OEHHA for children. The second (w) cancer risk is based on a 40-year adult worker exposure.
Source: Data modeled by ENSR 2007

Of the 22 residential locations identified for evaluating maximum individual health risk impacts, cancer risk at the MEIR was determined to be 2.6 in one million, which is less than the significance criterion of 10 in one million. The non-cancer chronic HI at the MEIR was determined to be 0.0013, which is less than the significance criterion of 1.0.

Two off-site worker locations were identified for evaluating maximum individual health risk impacts at the MEIW. Cancer risk at the MEIW, based on worker exposure assumptions, was determined to be 0.25 per million. The non-cancer chronic HI at the MEIW was determined to be 0.00016. These values are less than the significance criteria.

Four sensitive receptors were identified within 2-kilometers of the proposed Lowe's site. The schools are located northeast of the project. For evaluating school receptors, two exposure durations were modeled. The first was to evaluate potential health risk impacts to children that may be attending the school. The health risk assessment used a 9-year exposure period to estimate health risks to children. This exposure scenario accounts for the higher breathing rate to body mass ratio of a child compared to an adult and is appropriate for use in estimating child exposure. The second assessment was of the school as an occupational (worker) receptor, similar to the analysis performed identification of impacts at the MEIW.

Estimated cancer risks and non-cancer chronic impacts at all receptors evaluated in this HRA were determined to be less than the SJVAPCD significance levels of 10 per million and 1.0, respectively. Impacts would be **less than significant.**

IMPACT 4.3-4 Generation of Long-Term Operation-Related (Local) Mobile-Source Emissions of Carbon Monoxide. *The proposed project would generate a trip increase that is less than 1.0% of existing traffic volumes on local area roadways and would not decrease the LOS of these roadways. The proposed project would be defined as a small project (e.g., generates less than 1,000 trips per day) for which no quantitative analysis would be required. Project-generated, long-term operation-related (local) mobile-source emissions of CO would not violate or contribute substantially to a violation of the CAAQS or NAAQS, or expose sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant****.*

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations may reach unhealthy levels with respect to local sensitive land-uses such as residential areas, schools, and hospitals. As a result, SJVAPCD recommends analysis of CO emissions at a local rather than a regional level.

SJVAPCD has established preliminary screening criteria to determine with fair certainty that if not violated project-generated long-term operational local mobile-source emissions of CO would not violate or contribute substantially contribute to a violation of the CAAQS or NAAQS. SJVAPCD's preliminary screening criteria include the following:

- a traffic study for the project indicates that the level of service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to LOS E or F; or
- a traffic study for the project indicates that implementation would substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity (SJVAPCD 2002).

The project's traffic analysis, Section 4.11, "Transportation and Circulation," indicates that the all signalized intersections that were analyzed would operate at LOS E or LOS F under cumulative conditions without and with the project. While mitigation measures have been proposed that would alleviate the congestion, the lack of adequate funding leads to the conclusion that the mitigation measures may not be in place prior to the completion of the proposed project. Therefore, further investigation of potential CO impacts is warranted. The SJVAPCD

GAMAQI recommends a screening analysis as prescribed in the *Transportation Project-Level Carbon Monoxide Protocol* (UC Davis 1997.) However, subsequent to the publication of GAMAQI, the screening method in the Protocol has become obsolete. As a substitute, various air quality agencies in California have developed conservative screening methods. The SJVAPCD has not developed quantitative CO screening criteria; therefore, the methods of the Sacramento Metropolitan Air Quality Management District (SMAQMD) are used (SMAQMD 2004). The method is based on background CO concentrations and project trip generation, and is not dependent on the traffic volumes or geometry for a specific intersection. The screening is based on the background concentration of CO and a conservative estimate of project-related CO as a function of peak hour trip generation. The screening analysis for potential CO impacts at a generalized intersection is shown in Table 4.3-7. As shown in the table, the anticipated 1-hour and 8-hour CO concentrations would be less than the national and state standards. The proposed project would not create a CO hot spot; the impact would be **less than significant**.

Table 4.3-7
CO Screening for a Generalized Local Intersection

Concentration (ppm)	1-Hour	8-Hour
Background[1]	4.4	N/A
Project-Related[2]	2.2	N/A
Anticipated Total[3]	6.6	4.6
NAAQS	35	9.0
CAAQS	20	9.0
Exceed standards?	No	No

[1] Highest value from Table 4.3-1.
[2] Peak hour trip generation is 672 vehicles in the evening peak hour. CO contribution is interpolated from SMAQMD table as 2.2 ppm.
[3] Eight-hour concentration assumed to be 0.7 times 1-hour concentration.
Sources: Data compiled by EDAW 2007, SMAQMD 2004

IMPACT 4.3-5 Exposure of Sensitive Receptors to Odors. *The proposed commercial center would not be a major generation source of odors. However, the nature of the businesses that would occupy the shopping center is not known, and one or more of the businesses could be a minor source of objectionable odors, which could adversely affect nearby sensitive receptors. Therefore, this would be a* ***potentially significant*** *impact.*

The occurrence and severity of odor impacts depends on numerous factors, including: the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies. Projects with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact.

SJVAPCD has developed screening-level distances to potential major odor sources (e.g., wastewater treatment facilities, food processing facilities, and landfills) to identify areas where potential odor sources could be significant (SJVAPCD 2002). The proposed project is not considered a major odor source nor is it located in close proximity to any major odor sources.

The SJVAPCD has no record of specific odor complaints from home improvement center or general retail land uses in their database. However, several of the SLVAPCD staff recalled that over the past 15 years there have been a few odor complaints related to manicure salons and dry cleaners that might be located in a commercial center (Clarke, pers. comm., 2007). In addition to these sources, restaurant exhaust, automotive repair, and other businesses could be sources of objectionable odors. A residential area is located on the north side of Daniels

Street, across from the project site. The operation of one or more of the sources described above could result in the frequent exposure of on-site receptors to substantial objectionable odor emissions. As a result, this impact would be considered **potentially significant**.

Mitigation Measure 4.3-5

The Applicant shall require all business that occupy the property to install odor-controls as necessary to prevent a substantial dispersion of odors to adjacent residential areas.

Significance after Mitigation

Implementation of Mitigation Measure 4.3-5 would provide adequate controls for minor odor sources. As a result, this impact would be **less than significant**.

IMPACT 4.3-6	Increases in Greenhouse Gas Emissions. *Emissions of GHG during construction and operation would be less than the 25,000 tons per year threshold for direct project impact; the direct impact would be* ***less than significant.***

Short-term construction and long-term operation of the project would generate emissions of GHGs. Construction emissions would come from vehicle engine exhaust. Operations emissions would come from area- and mobile-sources. Area-source emissions would be associated with activities such as natural gas use for area and water heating, electrical energy use for building operations, maintenance of landscaping and grounds, waste disposal, and other sources. Mobile-source emissions of GHGs would include project-generated vehicle trips for customers, employees, and vendors. In addition, increases in stationary-source emissions could occur at off-site utility providers associated with energy supply to the proposed uses within the project site.

GHG emissions generated by the proposed project would predominantly be in the form of CO_2. In comparison to criteria air pollutants, such as ozone and PM_{10}, CO_2 emissions persist in the atmosphere for a much longer period of time. While emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, the emission levels of these other GHGs for the sources considered for this project are relatively small compared with CO_2 emissions.

CO_2 emissions were calculated for the proposed project. Emission factors and calculation methods for GHG from development projects have not been formally adopted for use by the state or SJVAPCD. The most recent URBEMIS model, URBEMIS2007, includes an output of CO_2 emissions. The California Climate Action Registry (CCAR) *General Reporting Protocol* is the most comprehensive guidance, but the protocol is designed to be used by existing large entities and facilities where there are records of energy use, vehicle fleet activities, and manufacturing processes (CCAR 2007). Both construction and operations emissions were calculated with URBEMIS. Operations emissions were also calculated using the CCAR Protocol; however, construction data is not available in the form that would provide input to CCAR Protocol methods. For area sources, URBEMIS calculates CO_2 from natural gas use. The CCAR Protocol has calculation formulas for natural gas use and electricity use. The emissions from electricity use may occur a long distance from the point of electrical use, but on a global scale, the location of emissions is of less importance. The two methods appear to use different emission factors and other assumptions, but both of the methods provide results of the same order of magnitude. An additional feature of the CCAR method is that there are factors for calculating CH_4 and N_2O, which can be summed with CO_2 to yield CO_2e. For the CCAR calculations of operations emissions, the following assumptions were made:

- Average trip distance would be 7.4 miles. This value was taken from the URBEMIS calculations of total vehicle miles traveled and dividing that value by the daily trip generation.

- Average natural gas consumption would be 49.8 cubic feet per square foot of building space per year. Average electrical use would be 11.8 kilowatt hours per square foot of building space per year. These values were taken from statistics provided by the U.S. Department of Energy, Energy Information Administration (DOE EIA).

The results of the calculations are shown in Table 4.3-8.

Table 4.3-8
Summary of Modeled and Calculated Construction and Operation Emissions of Greenhouse Gases (Carbon Dioxide)

Method/Source	Emissions	
URBEMIS2007[1]	TPY CO_2	
Construction Emissions for 2008	**186**	
Construction Emissions for 2009	172	
Area Emissions for 2010 (Natural Gas)	**410**	
Vehicle Emissions for 2010	**8,723**	
Total Operations Emissions for 2010	9,133	
California Climate Action Registry[2]	**TPY CO_2**	**TPY CO_2e**
Natural Gas Emissions for 2010	603	605
Electricity Use Emissions for 2010	962	963
Area Emissions for 2010	1,565	1,568
Vehicle Emissions for 2010	7,686	7,946
Total Operations Emissions for 2010	**9,251**	**9,514**

[1] Emissions modeled using the Urbemis2007 computer model. Model assumptions described in methodology sections and in impacts 4.3-1 and 4.3-2. Data sheets in Appendix C.
[2] Emissions calculated using CCAR Protocol and assumptions described in preceding text. Data sheets in Appendix C
Source: Data modeled by EDAW 2007.

As shown in Table 4.3-8, estimated GHG emissions for 2008, 2009, and 2010 would be less than 25,000 tons per year. Therefore direct impact of GHG emissions would be **less than significant.**