

4.3 AIR QUALITY

This section provides a discussion of the existing air quality environment and an analysis of potential impacts from implementation of the proposed project. This section summarizes information provided in the *Air Quality Assessment Report* (LSA Associates, Inc., October 2010). The *Air Quality Assessment Report* is included in Appendix C of this Environmental Impact Report (EIR).

4.3.1 Existing Environmental Setting

The project site is located in Orange County, which is part of the South Coast Air Basin (SCAB) and is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

4.3.1.1 Meteorology

Air quality in the planning area is affected not only by various emission sources (mobile, industry, etc.) but also by atmospheric conditions such as wind speed, wind direction, temperature, and rainfall. The combination of topography, low mixing height, abundant sunshine, and emissions from the second largest urban area in the United States gives the SCAB the worst air pollution problem in the nation.

Climate in the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern border and high mountains surround the rest of the SCAB. The SCAB lies in the semipermanent high-pressure zone of the eastern Pacific; the resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the SCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site is the Laguna Beach Station. The annual average maximum temperature recorded at this station is 71.2°F, and the annual average minimum is 51.0°F. January is typically the coldest month in this area of the SCAB.

The majority of annual rainfall in the SCAB occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the SCAB and along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the Laguna Beach Station. Average rainfall measured at this station varies from 2.79 inches in February to 0.46 inch or less between May and October, with an average annual total of 12.61 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

Although the SCAB has a semiarid climate, air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally. The dominant daily wind pattern is an onshore 8 to 12 miles per hour (mph) daytime breeze and an offshore 3 to 5 mph nighttime breeze. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly (Santa Ana) winds from

the mountains and deserts northeast of the SCAB. Summer wind flow patterns represent worst-case conditions because this is the period of higher temperatures and more sunlight, which results in ozone (O₃) formation.

During spring and early summer, pollution produced during any particular day is typically blown out of the SCAB through mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. Air contaminants can be transported 60 miles or more from the SCAB by ocean air during the afternoon. From early fall to winter, the transport is less pronounced because of slower average wind speeds and the appearance of drainage winds earlier in the day. During stagnant wind conditions, offshore drainage winds may begin by late afternoon. Pollutants remaining in the SCAB are trapped and begin to accumulate during the night and the following morning. A low morning wind speed in pollutant source areas is an important indicator of air stagnation and the potential for buildup of primary air contaminants.

Temperature normally decreases with altitude, and a reversal of this atmospheric state, where temperature increases with altitude, is called an inversion. The height from the earth to the inversion base is known as the mixing height. Persistent low inversions and cool coastal air tend to create morning fog and low stratus clouds. Cloudy days are less likely in the eastern portions of the SCAB and are about 25 percent more likely along the coast. The vertical dispersion of air pollutants in the SCAB is limited by temperature inversions in the atmosphere close to the earth's surface.

Inversions are generally lower in the nighttime, when the ground is cool, than during daylight hours, when the sun warms the ground and, in turn, the surface air layer. As this heating process continues, the temperature of the surface air layer approaches the temperature of the inversion base, causing heating along its lower edge. If enough warming takes place, the inversion layer becomes weak and opens up to allow the surface air layers to mix upward. This can be seen in the middle to late afternoon on a hot summer day when the smog appears to clear up suddenly. Winter inversions typically break earlier in the day, preventing excessive contaminant buildup.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problem is accumulation of carbon monoxide (CO) and oxides of nitrogen (NO_x) due to extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_x to form photochemical smog.

4.3.1.2 Air Pollution Constituents

Criteria air pollutants are those that are regulated by federal and State law. Criteria pollutants are discussed in more detail below.

Ozone. O₃ (smog) is formed by photochemical reactions between NO_x and reactive organic gases (ROGs) rather than being directly emitted. O₃ is a pungent, colorless gas typical of Southern California smog. Elevated O₃ concentrations result in reduced lung function, particularly during

vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, the elderly, and young children. O₃ levels peak during the summer and early fall.

Carbon Monoxide. CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions.

Nitrogen Oxides. Nitrogen dioxide (NO₂), a reddish-brown gas, and nitric oxide (NO), a colorless and odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as NO_x. NO_x is a primary component of the photochemical smog reaction. It also contributes to other pollution problems, including a high concentration of particulate matter less than 2.5 microns in diameter (PM_{2.5}), poor visibility, and acid deposition (i.e., acid rain). NO₂ decreases lung function and may reduce resistance to infection.

Sulfur Dioxide. Sulfur dioxide (SO₂) is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO₂ levels. SO₂ irritates the respiratory tract, can injure lung tissue when combined with PM_{2.5}, and reduces visibility and the level of sunlight.

Lead. Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the bloodstream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead.

Particulate Matter. Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particulates (particulate matter less than 10 microns in diameter, or PM₁₀) are derived from a variety of sources, including windblown dust and grinding operations. Fuel combustion and resultant exhaust from power plants and diesel buses and trucks are primarily responsible for fine particulate matter (PM_{2.5}) levels. Fine particles can also be formed in the atmosphere through chemical reactions. PM₁₀ can accumulate in the respiratory system and aggravate health problems such as asthma. The United States Environmental Protection Agency's (EPA) scientific review concluded that fine particulate matter, which penetrates deeply into the lungs, is more likely than coarse particulate matter to contribute to the health effects listed in a number of recently published community epidemiological studies at concentrations that extend well below those allowed by the current PM₁₀ standards. These health effects include premature death and increased hospital admissions and emergency room visits, primarily among the elderly and individuals with cardiopulmonary disease; increased respiratory symptoms and disease in children and individuals with cardiopulmonary disease such as asthma; decreased lung function, particularly in children and individuals with asthma; and alterations in lung tissue and structure and in respiratory tract defense mechanisms.

Reactive Organic Compounds. Reactive organic compounds (ROCs) (also known as reactive organic gases [ROGs] and volatile organic compounds [VOCs]) are formed from the combustion of fuels and the evaporation of organic solvents. ROCs are not defined as criteria pollutants, but are a prime component of the photochemical smog reaction. Consequently, ROCs accumulate in the atmosphere more quickly during the winter, when sunlight is limited and photochemical reactions are slower.

4.3.1.3 Health Effects

Table 4.3.1 lists the health effects of the criteria pollutants and their potential sources. Because the State and federal concentration standards are set at levels that protect public health with an adequate margin of safety, these health effects will not occur unless the standards are exceeded by a large margin.

4.3.1.4 Regional Air Quality

Both the State of California and the federal government have established health-based ambient air quality standards (AAQS) for six criteria air pollutants described previously. Areas that meet the AAQs are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Data collected at air quality monitoring stations throughout the State are used by the California Air Resources Board (ARB) and EPA to classify air basins as attainment, nonattainment, nonattainment-transitional, or unclassified based on air quality data for the most recent 3 calendar years compared with the AAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. The air quality data are also used to monitor progress in attaining air quality standards. Table 4.3.2 summarizes the attainment status in the SCAB for the major criteria pollutants.

4.3.1.5 Local Air Quality

The SCAQMD, together with ARB, maintains ambient air quality monitoring stations in the SCAB. The air quality monitoring station closest to the site is the Mission Viejo Air Monitoring Station, and its air quality trends are representative of the ambient air quality in the project area. The pollutants monitored at this station are O₃, PM₁₀, PM_{2.5}, and CO. The closest air quality monitoring site that monitors NO₂ is the Costa Mesa Station, and its air quality trends are also representative of the ambient air quality in the project area.

The ambient air quality data in Table 4.3.3 show that CO and NO₂ levels are below the relevant State and federal standards. O₃ exceeded the State 1-hour standard 5 to 13 days during the last 3 years for which data are available (2006 through 2008). Table 4.3.3 also shows that during the same 3-year period the State 8-hour O₃ standards were exceeded from 10 to 25 times, the federal 8-hour O₃ standards were exceeded 5 to 15 times, and the 24-hour PM₁₀ levels exceeded State standards 0 to 3 days per year; however, the federal 24-hour PM_{2.5} standard was not exceeded.

Table 4.3.1: Summary of Health and Other Effects of the Major Criteria Air Pollutants

Pollutants	Sources	Primary Effects
O ₃	Atmospheric reaction of organic gases with NO _x in the presence of sunlight.	<ul style="list-style-type: none"> • Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
NO ₂	Motor vehicle exhaust. High-temperature stationary combustion. Atmospheric reactions.	<ul style="list-style-type: none"> • Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
CO	Byproducts from incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. Natural events, such as decomposition of organic matter.	<ul style="list-style-type: none"> • Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Suspended Particulate Matter (PM _{2.5} and PM ₁₀)	Stationary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	<ul style="list-style-type: none"> • Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
SO ₂	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	<ul style="list-style-type: none"> • Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.
Lead	Contaminated soil (e.g., from leaded fuels and lead-based paints).	<ul style="list-style-type: none"> • Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

CO = carbon monoxide

NO₂ = nitrogen dioxide

NO_x = oxides of nitrogen

O₃ = ozone

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

SO₂ = sulfur dioxide

Table 4.3.2: Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
O ₃ : 1-hour	Nonattainment	Revoked June 2005
O ₃ : 8-hour	Nonattainment	Severe-17 Nonattainment ¹
PM ₁₀	Nonattainment	Serious Nonattainment ²
PM _{2.5}	Nonattainment	Nonattainment ³
CO	Attainment	Attainment/Maintenance ⁴
NO ₂	Nonattainment	Attainment/Maintenance
Lead	Attainment ⁵	Attainment
All others	Attainment/Unclassified	Attainment/Unclassified

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

¹ The EPA has officially designated the status for most of the SCAB regarding the 8-hour O₃ standard as "Severe 17," which means the SCAB has until 2021 to attain the federal 8-hour O₃ standard. The SCAQMD has requested that the SCAB federal designation be changed from severe to extreme nonattainment. This change would extend the attainment deadline to 2023.

² In October 2006, the EPA, in its final rule revision, eliminated the annual PM₁₀ standard.

³ The PM_{2.5} nonattainment designation is based on the 1997 standard. In 2006, the EPA revised the 24-hour standard. The 2006 PM_{2.5} new standard of 35 µg/m³ applies 1 year after the effective date of the new designation (October 2010).

⁴ Effective June 11, 2007, the SCAB was redesignated as attainment/ maintenance for the federal CO standard.

⁵ Lead is in nonattainment for the State standard only in the Los Angeles County portion of the SCAB.

µg/m³ = micrograms per cubic meter

CO = carbon monoxide

EPA = United States Environmental Protection Agency

NO₂ = nitrogen dioxide

O₃ = ozone

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

SCAB = South Coast Air Basin

SCAQMD = South Coast Air Quality Management

Table 4.3.3: Ambient Air Quality Levels at the Mission Viejo Air Monitoring Station

Pollutant	Standard	2007	2008	2009
Carbon Monoxide				
Max 1-hr concentration (ppm)		2.9	1.5	NA
No. days exceeded: State	> 20 ppm/1-hr	0	0	0
Federal	> 35 ppm/1-hr	0	0	0
Max 8-hr concentration (ppm)		2.2	1.1	1.0
No. days exceeded: State	9 ppm/8-hr	0	0	0
Federal	9 ppm/8-hr	0	0	0
Ozone				
Max 1-hr concentration (ppm)		0.108	0.118	0.121
No. days exceeded: State	> 0.09 ppm/1-hr	5	9	7
Max 8-hr concentration (ppm)		0.090	0.104	0.095
No. days exceeded: State	> 0.07 ppm/8-hr	10	25	14
Federal	> 0.075 ppm/8-hr	5	15	10
Particulates (PM₁₀)				
Max 24-hr concentration (µg/m ³)		74	42	41
No. days exceeded: State	> 50 µg/m ³ /24-hr	3	0	1
Federal	> 150 µg/m ³ /24-hr	0	0	0
Annual Arithmetic Average (µg/m ³)		23.0	22.6	23.2
Exceeded: State	> 20 µg/m ³ ann. arth. avg.	Yes	Yes	Yes
Particulates (PM_{2.5})				
Max 24-hr concentration (µg/m ³)		46.8	32.6	39.2
No. days exceeded: Federal	> 35 µg/m ³ /24-hr	2	0	1
Annual Arithmetic Average (µg/m ³)		11.1	10.4	9.5
Exceeded: State	> 12 µg/m ³ ann. arth. avg.	No	No	No
Federal	> 15 µg/m ³ ann. arth. avg.	No	No	No
Nitrogen Dioxide				
Max 1-hr concentration (ppm)		0.074	0.081	0.065
No. days exceeded: State	> 0.25 ppm/1-hr	0	0	0
Annual arithmetic average concentration (ppm)		0.013	0.013	0.013
Exceeded: Federal	> 0.053 ppm ann. arth. avg.	No	No	No

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

hr = hour

NA = data not available

No. = number

ppm = parts per million

µg/m³ = micrograms per cubic meter

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

4.3.2 Regulatory Setting

4.3.2.1 Federal Regulations

Clean Air Act. Pursuant to the federal Clean Air Act (CAA) of 1970, the EPA established national ambient air quality standards (NAAQS). The NAAQS were established for six major pollutants, termed “criteria” pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established AAQS, or criteria, for outdoor concentrations in order to protect public health. The AAQS are shown in Table 4.3.4.

Data collected at permanent monitoring stations are used by the EPA to classify regions as “attainment” or “nonattainment,” depending on whether the regions meet the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA.

The EPA has designated the Southern California Association of Governments (SCAG) as the Metropolitan Planning Organization (MPO) responsible for ensuring compliance with the requirements of the CAA for the SCAB.

The EPA established new NAAQS for ground-level O₃ and PM_{2.5} in 1997. On May 14, 1999, the Court of Appeals for the District of Columbia Circuit issued a decision ruling that the CAA, as applied in setting the new public health standards for O₃ and particulate matter, was unconstitutional as an improper delegation of legislative authority to the EPA. On February 27, 2001, the United States Supreme Court upheld the way the government sets air quality standards under the CAA. The court unanimously rejected industry arguments that the EPA must consider financial cost as well as health benefits in writing standards. The justices also rejected arguments that the EPA took too much lawmaking power from Congress when it set tougher standards for O₃ and soot in 1997. Nevertheless, the court threw out the EPA’s policy for implementing new O₃ rules, saying that the agency ignored a section of the law that restricts its authority to enforce such rules.

In April 2003, the EPA was cleared by the White House Office of Management and Budget (OMB) to implement the 8-hour ground-level O₃ standard. The EPA issued the proposed rule implementing the 8-hour O₃ standard in April 2003. The EPA completed final 8-hour nonattainment status on April 15, 2004. The EPA revoked the 1-hour O₃ standard on June 15, 2005, and lowered the 8-hour O₃ standard from 0.08 parts per million (ppm) to 0.075 ppm on April 1, 2008.

The EPA issued the final PM_{2.5} implementation rule in Fall 2004. The EPA lowered the 24-hour PM_{2.5} standard from 65 micrograms per cubic meter (µg/m³) to 35 µg/m³ and revoked the annual PM₁₀ standard on December 17, 2006. The EPA issued final designations for the 2006 24-hour PM_{2.5} standard on December 12, 2008.

4.3.2.2 State Regulations

Air Resources Board. In 1967, the California Legislature passed the Mulford-Carrell Act, which combined two Department of Health bureaus, the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board, to establish ARB. Since its formation, ARB has worked with the public, the business sector, and local governments to find solutions to California’s air pollution problems.

Table 4.3.4: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		Federal Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
Ozone (O ₃)	1-Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm (137 µg/m ³)		0.075 ppm (147 µg/m ³)		
Respirable Particulate Matter (PM ₁₀)	24-Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m ³		--		
Fine Particulate Matter (PM _{2.5})	24-Hour	No Separate State Standard		35 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m ³	Gravimetric or Beta Attenuation	15.0 µg/m ³		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m ³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m ³)		—		
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm (56 µg/m ³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m ³) (see footnote 8)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (339 µg/m ³)		0.100 ppm (188 µg/m ³) (see footnote 8)	None	
Sulfur Dioxide (SO ₂)	24-Hour	0.04 ppm (105 µg/m ³)	Ultraviolet Fluorescence	—	0.5 ppm (1300 µg/m ³) (see footnote 9)	Spectrophotometry (Pararosaniline Method)
	3-Hour	—		—		
	1-Hour	0.25 ppm (655 µg/m ³)		75 ppb (196 µg/m ³) (see footnote 9)		
Lead ¹⁰	30 Day Average	1.5 µg/m ³	Atomic Absorption	—	Same as Primary Standard	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m ³		
	Rolling 3- Month Average ¹¹	—		0.15 µg/m ³		
Visibility- Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m ³	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence			
Vinyl Chloride ¹⁰	24-Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography			

Source: California Air Resources Board, September 8, 2010.

Table footnotes are provided on the following page.

Footnotes:

- ¹ California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1- and 24-hour); nitrogen dioxide; suspended particulate matter (PM₁₀, and PM_{2.5}), and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- ² National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than 1. For PM_{2.5}, the 24-hour standard is attained when 98 percent 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.
- ³ Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- ⁴ Any equivalent procedure which can be shown to the satisfaction of ARB to give equivalent results at or near the level of the air quality standard may be used.
- 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 Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.
- ⁸ To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.
- ⁹ On June 2, 2010, the EPA established a new 1-hour SO₂ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO₂ standard of 0.14 ppm and the annual primary SO₂ standard of 0.030 ppm, effective August 23, 2010. The secondary SO₂ standard was not revised at that time; however, the secondary standard is undergoing a separate review by the EPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
- ¹⁰ The ARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- ¹¹ National lead standard, rolling 3-month average: final rule signed October 15, 2008.

ARB = California Air Resources Board

°C = degrees Celsius

EPA = United States Environmental Protection Agency

µg/m³ = micrograms per cubic meter

mg/m³ = milligrams per cubic meter

ppm = parts per million

ppb = parts per billion

ARB identified particulate emissions from diesel-fueled engines (diesel particulate matter [DPM] plus diesel exhaust organic gases) as toxic air contaminants (TACs) in August 1998. Following the identification process, ARB was required by law to determine whether there is a need for further control. In September 2000, ARB adopted the Diesel Risk Reduction Plan (Diesel RRP), which recommends many control measures to reduce the risks associated with DPM and achieve a goal of 75 percent DPM reduction by 2010 and 85 percent by 2020.

4.3.2.3 Local Plans and Regulations

Regional Air Quality Planning Framework. The 1976 Lewis Air Quality Management Act established the SCAQMD and other air districts throughout the State. The federal CAA Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

ARB coordinates and oversees both State and federal air pollution control programs in California. ARB oversees activities of local air quality management agencies and is responsible for incorporating Air Quality Management Plans (AQMPs) for local air basins into a State Implementation Plan (SIP) for EPA approval. ARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by ARB to classify air basins as “attainment” or “nonattainment” with respect to each pollutant and to monitor progress in attaining air quality standards. ARB has divided the State into 15 air basins. Significant authority for air quality control within them has been given to local air districts that regulate stationary-source emissions and develop local nonattainment plans.

Regional Air Quality Management Plan. The SCAQMD and SCAG are responsible for formulating and implementing the AQMP for the Basin. Every 3 years, the SCAQMD prepares a new AQMP, updating the previous plan and having a 20-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to ARB for review and approval. ARB approved a modified version of the 2003 AQMP and forwarded it to the EPA in October 2003 for review and approval.

The 2003 AQMP updates the attainment demonstration for the federal standards for O₃ and PM₁₀, replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future, and updates the maintenance plan for the federal NO₂ standard that the SCAB has met since 1992.

The 2003 AQMP proposes policies and measures to achieve federal and State standards for healthful air quality in the SCAB and those portions of the Salton Sea Air Basin (formerly named the Southeast Desert Air Basin) that are under district jurisdiction (namely, the Coachella Valley). The Coachella Valley PM₁₀ Plan was revised in June 2002 and forwarded to ARB and the EPA for approval. The EPA approved the 2002 Coachella Valley SIP on April 18, 2003.

The 2003 AQMP also addresses several State and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. This AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the O₃ SIP for the SCAB for the attainment of the federal O₃ air quality standard. However, this

revision points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/99 Plan) to offset increased emission estimates from mobile sources and to meet all federal criteria pollutant standards within the time frames allowed under the federal CAA.

On June 1, 2007, the SCAQMD adopted the 2007 AQMP, which it describes as a regional and multiagency effort involving the SCAQMD Governing Board, ARB, SCAG, and the EPA. State and federal planning requirements include developing control strategies, attainment demonstration, reasonable further progress, and maintenance plans. The 2007 AQMP also incorporated significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. ARB adopted the SCAQMD 2007 AQMP as part of the 2007 SIP and forwarded it to the EPA for review and approval. The SCAQMD is awaiting EPA's review and approval on its 2007 AQMP as part of the 2007 SIP.

Local Regulations.

County of Orange General Plan. The Resources Element of the Orange County General Plan includes the following goal and objectives for air resources that are applicable to the proposed project:

- **Air Resources Goal 1:** Promote optimum sustainable environmental quality standards for air resources.
- **Air Resources Objective 1.1:** To the extent feasible, attainment of federal and state air quality standards by the year 2007.

City of San Clemente General Plan. The Natural and Historic/Cultural Resources Element of the City of San Clemente General Plan includes the following goal for air resources that is applicable to the proposed project:

- **Air Quality Goal:** Implementation of regional AQMD air quality mitigation measures for new development.
- **Air Quality Policy 10.9.1:** Require that new development utilize appropriate AQMD air quality mitigation measures (SMMs and BAMMs).

Please see Appendix N of this EIR for a summary of the project's General Plan consistency pursuant to California Environmental Quality Act (CEQA) Guidelines, California Code of Regulations (CCR) Section 15125(d).

4.3.3 Methodology

An estimate of the construction emissions was conducted using the Road Construction Emissions Model developed by the Sacramento Metropolitan Air Quality Management District. The model can be used to estimate emissions from both construction vehicle exhaust and fugitive dust.

The potential impact of the proposed roadway widening project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from the EMFAC2007 emission

model. A supplemental traffic analysis prepared by Austin-Foust Associates, Inc. (October 2009) estimated the impact that the proposed project would have on regional vehicle miles traveled (VMT) and vehicle hours traveled (VHT).

The VMT and VHT data from the supplemental traffic analysis, along with the EMFAC2007 emission rates, were used to calculate the CO, ROG, NO_x, oxides of sulfur (SO_x), PM₁₀, and PM_{2.5} emissions for the 2016 and 2035 regional conditions.

The traffic analysis prepared by Austin-Foust Associates, Inc. (September 2009) evaluated the existing (2009), 2016, and 2035 traffic conditions at multiple intersections within the project area. These intersection vehicle turn volumes were used in the California Department of Transportation (Caltrans) CALINE4 model to evaluate local CO concentrations at the intersections most affected by project traffic. Per EPA guidelines, the highest of the second-highest CO concentrations measured within the past 3 years were used as the background levels. At the Mission Viejo Air Monitoring Station, the background concentrations are 2.7 ppm for the 1-hour period and 2 ppm for the 8-hour period.

SCAQMD has developed localized significance threshold (LST) methodology that can be used to determine whether or not a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or State AAQS and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). SCAQMD's current guidelines, *Final Localized Significance Threshold Methodology* (June 2003, revised July 2008) and *Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (October 2006) were adhered to in the assessment of air quality impacts for the proposed project.

The LST analysis is used to determine whether the daily emissions for the proposed construction activities could result in significant localized air quality impacts. The emissions of concern from construction activities are NO_x, CO, PM₁₀, and PM_{2.5} combustion emissions from construction equipment and fugitive PM₁₀ dust from construction site preparation activities. Off-site mobile emissions (if any) from the project are not included in the emissions compared to the LSTs.

4.3.4 Thresholds of Significance

The impact significance criteria used for this analysis are based primarily on Appendix G of the CEQA Guidelines and the County of Orange *Local CEQA Procedures Manual* (2000). The project may be considered to have a significant effect related to air quality if implementation would result in one of more of the following:

- Threshold 4.3.1:** Conflict with or obstruct implementation of the applicable air quality plan?
- Threshold 4.3.2:** Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

- Threshold 4.3.3:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?
- Threshold 4.3.4:** Expose sensitive receptors to substantial pollutant concentrations?
- Threshold 4.3.5:** Create objectionable odors affecting a substantial number of people?

4.3.4.1 SCAQMD Criteria

The SCAB is administered by SCAQMD. SCAQMD has established guidelines and emissions thresholds in its *CEQA Air Quality Handbook* (SCAQMD, April 1993). In addition to the federal and State AAQS, there are daily emissions thresholds for construction and operation of a proposed project in the SCAB. It should be noted that the emissions thresholds were established based on the attainment status of the SCAB in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety (EPA), these emissions thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

4.3.4.2 Thresholds for Construction Emissions

The following CEQA significance thresholds for construction emissions have been established for the SCAB:

- 75 pounds per day (lbs/day) of ROCs
- 100 lbs/day of NO_x
- 550 lbs/day of CO
- 150 lbs/day of PM₁₀
- 55 lbs/day of PM_{2.5}
- 150 lbs/day of SO_x

Projects in the SCAB with construction-related emissions that exceed any of the emissions thresholds are considered to be significant under the SCAQMD guidelines.

4.3.4.3 Thresholds for Operational Emissions

The daily operational emissions significance thresholds for the SCAB are as follows.

Emission Thresholds for Pollutants with Regional Effects. Projects with operation-related emissions that exceed any of the emissions thresholds listed below are considered significant under the SCAQMD guidelines.

- 55 lbs/day of ROCs
- 55 lbs/day of NO_x
- 550 lbs/day of CO
- 150 lbs/day of PM₁₀
- 55 lbs/day of PM_{2.5}
- 150 lbs/day of SO_x

Local Microscale Concentration Standards. The significance of localized project impacts under CEQA depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. If ambient levels are below the standards, a project is considered to have a significant impact if project emissions would result in an exceedance of one or more of these standards. If ambient levels already exceed a State or federal standard, project emissions are considered significant if they increase 1-hour CO concentrations by 1 ppm or more or 8-hour CO concentrations by 0.45 ppm or more. The following are applicable local emissions concentration standards for CO:

- California State 1-hour CO standard of 20.0 ppm
- California State 8-hour CO standard of 9.0 ppm

4.3.4.4 Thresholds for Localized Significance

For this project, the appropriate SRA for the LST is the Capistrano Valley area (Area 21). This project includes 237 acres of disturbance.

Following the SCAQMD LST methodology, dispersion modeling needs to be conducted for sites larger than 5 acres. Each of the project areas are larger than the 5-acre limit of the LST look-up methodology; however, at the time of this air quality analysis, the sites do not have any construction details, schedules, etc., so using the 5-acre look-up values provides a conservative estimate of the off-site impacts.

The sensitive receptors closest to the project area are located within 50 feet of the active construction areas. The shortest distance threshold in the LST guidance is 25 meters (82 feet). Therefore, the following 25-meter thresholds are used for the proposed project.

- Construction thresholds for a 5-acre site at 25 meters (82 feet):
 - 197 lbs/day of NO_x
 - 1,804 lbs/day of CO
 - 12 lbs/day of PM₁₀
 - 8 lbs/day of PM_{2.5}

4.3.5 Impacts and Mitigation

4.3.5.1 Less Than Significant Impacts

Threshold 4.3.1: Conflict with or obstruct implementation of the applicable air quality plan?

An analysis of a project's consistence with applicable air quality plans plays an essential role in local agency project review by linking local planning and unique individual projects to the AQMP in the following ways: (1) it fulfills the CEQA goal of fully informing local agency decision makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are fully addressed, and (2) it provides the local agency with ongoing information, assuring local decision makers that they are making real contributions to clean air goals defined in the most current AQMP (adopted in 2003 and updated in 2007). Because the AQMP uses projections based on local General Plans, projects that are consistent with the local General Plan are considered consistent with the AQMP. The implementation of the proposed project would also not delay timely implementation of the Transportation Control Measures (TCMs) identified in the AQMP. The operation of the proposed project would not significantly contribute to or cause deterioration of existing air quality; therefore, mitigation measures are not required for the long-term operation of the project. *The proposed project is included in the applicable General Plans (see Section 4.1, Land Use) and is consistent with the must current AQMP.*

Threshold 4.3.2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Threshold 4.3.3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

Threshold 4.3.4: Expose sensitive receptors to substantial pollutant concentrations?

Naturally Occurring Asbestos (NOA). The project is located in Orange County, which is not among the counties listed as containing serpentine and ultramafic rock. *Therefore, the impact from NOA during construction of the project would be minimal to none. No mitigation is required.*

Regional Vehicle Emissions. Long-term stationary- and mobile-source emissions would occur due to natural gas consumption and electricity usage by the proposed transportation facility. The proposed project would not generate new vehicular traffic trips since it would not construct new homes or businesses. In addition, as shown in Table 4.3.5, the proposed project would reduce regional VHT and VMT. As shown in Tables 4.3.6 and 4.3.7, the reduction of regional VHT and VMT would reduce regional vehicle emissions. *Therefore, the operation of the proposed project would not contribute significantly to regional vehicle emissions. No mitigation is required.*

Table 4.3.5: Change in Regional VMT and VHT

Year	Regional VMT	Regional VHT
Existing	7,045,375	146,012
2016 No Build	8,612,151	183,467
2016 Build	8,581,393	183,038
2035 No Build	10,689,041	233,117
2035 Build	10,617,510	232,120

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

VHT = vehicle hours traveled

VMT = vehicle miles traveled

Table 4.3.6: 2016 Change in Regional Vehicle Emissions (lbs/day)

Pollutant	2016 Baseline Emissions	2016 With Project Emissions	Project-Related Increase	SCAQMD Threshold
CO	34,091	33,976	-115	550
ROGs	1,678	1,672	-6	55
NO _x	10,883	10,841	-42	55
SO _x	76	76	0	150
PM ₁₀	824	821	-3	150
PM _{2.5}	429	428	-1	55

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

CO = carbon monoxide

lbs/day = pounds per day

NO_x = oxides of nitrogen

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

ROGs = reactive organic gases

SCAQMD = Southern California Air Quality Management District

SO_x = sulfur oxides

Table 4.3.7: 2035 Change in Regional Vehicle Emissions (lbs/day)

Pollutant	2035 Baseline Emissions	2035 With Project Emissions	Project-Related Increase	SCAQMD Threshold
CO	17,067	16,953	-114	550
ROGs	825	819	-6	55
NO _x	4,250	4,221	-28	55
SO _x	94	94	-1	150
PM ₁₀	919	913	-6	150
PM _{2.5}	546	542	-4	55

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

CO = carbon monoxide

lbs/day = pounds per day

NO_x = oxides of nitrogen

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

ROGs = reactive organic gases

SCAQMD = Southern California Air Quality Management District

SO_x = sulfur oxides

CO Hot-Spot Analysis. Long-term local CO emissions at intersections in the project vicinity would be affected by project-related traffic. The primary mobile-source pollutant of local concern is CO, which is a direct function of vehicle idling time and, thus, traffic flow conditions. CO is used as an indicator of a project's direct and indirect impact on local air quality because CO does not readily disperse in the local environment in cool weather when the wind is fairly still.

CO transport is extremely limited; it disperses rapidly with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations proximate to a congested roadway or intersection may reach unhealthful levels, affecting local sensitive receptors (residents, schoolchildren, the elderly, hospital patients, etc). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. In areas with a high ambient background CO concentration, modeling is recommended to determine a project's effect on local CO levels.

Tables 4.3.8, 4.3.9, and 4.3.10 list the CO concentrations at the intersections within the project area that would be affected by the proposed project for the existing, 2016, and 2035 conditions, respectively. As shown in Tables 4.3.8, 4.3.9, and 4.3.10, the 8-hour CO concentrations at these intersections would not exceed the federal and State standards of 9 ppm. The 1-hour CO concentrations at these intersections would also be below the State standard of 20 ppm and below the federal standard of 35 ppm. *Therefore, the operation of the proposed project would not have a significant impact on local air quality for CO, and no mitigation measures would be required.*

Threshold 4.3.5: Create objectionable odors affecting a substantial number of people?

Operational Emissions. The proposed project involves the extension of La Pata Avenue and Camino Del Rio. The percentage of truck traffic on La Pata Avenue and Camino Del Rio is expected to be low and very low, respectively.¹ Also, the percentage of trucks on the project roadways is expected to be the same with or without the implementation of the proposed project. Existing municipal waste vehicles use La Pata Avenue from State Route 74 (SR-74) south to the existing road terminus. The number of refuse trucks will not increase as a result of the proposed roadway improvements. Operation of the proposed roadway improvements will not result in odor impacts to sensitive receptors due to the distance to the receptors and the small percentage of truck traffic on the roadways.

¹ The traffic mix on La Pata Avenue comprises 87 percent automobiles, 8 percent medium-duty trucks, and 5 percent heavy-duty trucks during the daytime period (7:00 a.m. to 7:00 p.m.) under existing, future no build, and future build conditions. During the evening (7:00 p.m. to 10:00 p.m.) and nighttime periods (10:00 p.m. to 7:00 a.m.), the traffic mix along La Pata Avenue comprises 97 percent automobiles, 2 percent medium-duty trucks, and 1 percent heavy-duty trucks under existing, future no build, and future build conditions. Lastly, during the daytime period (7:00 a.m. to 7:00 p.m.), evening period (7:00 p.m. to 10:00 p.m.), and nighttime period (10:00 p.m. to 7:00 a.m.), the traffic mix along Avenida La Pata and Camino Del Rio comprises 98 percent automobiles and 2 percent medium-duty trucks under existing, future no build, and future build conditions.

Table 4.3.8: Existing CO Concentrations¹

Intersection	Receptor Distance to Road Centerline (meters)	1-Hr CO Concentration (ppm)	8-Hr CO Concentration (ppm)	Exceeds State Standards? ²	
				1-Hr	8-Hr
La Pata Avenue and SR-74	24	4.1	3.0	No	No
	21	4.1	3.0	No	No
	21	4.0	2.9	No	No
	19	3.9	2.8	No	No
La Pata Avenue and Camino Del Rio	14	2.7	2.0	No	No
	14	2.7	2.0	No	No
	10	2.7	2.0	No	No
	10	2.7	2.0	No	No
La Pata Avenue and Avenida Vista Hermosa	24	3.8	2.8	No	No
	21	3.8	2.8	No	No
	19	3.8	2.8	No	No
	17	3.7	2.7	No	No
Camino Vera Cruz and Avenida Vista Hermosa	17	4.1	3.0	No	No
	15	4.1	3.0	No	No
	15	4.1	3.0	No	No
	15	4.0	2.9	No	No
La Pata Avenue and Avenida Pico	24	3.6	2.6	No	No
	24	3.6	2.6	No	No
	22	3.5	2.6	No	No
	22	3.5	2.6	No	No
I-5 NB ramps and Avenida Vista Hermosa	14	4.6	3.3	No	No
	14	4.5	3.3	No	No
	12	4.2	3.1	No	No
	12	4.2	3.1	No	No
I-5 NB ramps and Avenida Pico	15	5.0	3.6	No	No
	14	4.9	3.5	No	No
	14	4.7	3.4	No	No
	14	4.6	3.3	No	No

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

¹ Includes the ambient 1-hour concentration of 2.7 ppm and ambient 8-hour concentration of 2 ppm. Measured at the Mission Viejo Air Monitoring Station at 26081 Via Pera, Mission Viejo, California (Orange County).

² The 1-hour CO State standard is 20 ppm, and the 8-hour CO standard is 9 ppm.

CO = carbon monoxide

I-5 = Interstate 5

NB = northbound

ppm = parts per million

SR-74 = State Route 74

Table 4.3.9: 2016 CO Concentrations¹

Intersection	Receptor Distance to Road Centerline (meters)	Project-Related Increase 1-Hr/8-Hr (ppm)	Without/With Project 1-Hr CO Concentration (ppm)	Without/With Project 8-Hr CO Concentration (ppm)	Exceeds State Standards? ²	
					1-Hr	8-Hr
La Pata Avenue and SR-74	24 / 24	0.1 / 0.1	4.0 / 4.1	2.9 / 3.0	No	No
	24 / 22	0.1 / 0.1	4.0 / 4.1	2.9 / 3.0	No	No
	22 / 21	0.1 / 0.1	4.0 / 4.1	2.9 / 3.0	No	No
	15 / 19	0.1 / 0.1	3.9 / 4.0	2.8 / 2.9	No	No
La Pata Avenue and Camino Del Rio	14 / 14	0.8 / 0.6	2.7 / 3.5	2.0 / 2.6	No	No
	14 / 14	0.8 / 0.6	2.7 / 3.5	2.0 / 2.6	No	No
	10 / 10	0.8 / 0.6	2.7 / 3.5	2.0 / 2.6	No	No
	10 / 10	0.7 / 0.5	2.7 / 3.4	2.0 / 2.5	No	No
La Pata Avenue and Avenida Vista Hermosa	24 / 24	0.0 / 0.0	3.8 / 3.8	2.8 / 2.8	No	No
	21 / 22	0.0 / 0.0	3.7 / 3.7	2.7 / 2.7	No	No
	19 / 21	0.0 / 0.0	3.7 / 3.7	2.7 / 2.7	No	No
	19 / 19	0.0 / 0.0	3.6 / 3.6	2.6 / 2.6	No	No
Camino Vera Cruz and Avenida Vista Hermosa	17 / 17	-0.1 / 0.0	3.9 / 3.8	2.8 / 2.8	No	No
	15 / 15	-0.1 / 0.0	3.9 / 3.8	2.8 / 2.8	No	No
	15 / 15	0.0 / 0.0	3.7 / 3.7	2.7 / 2.7	No	No
	15 / 15	0.0 / 0.0	3.7 / 3.7	2.7 / 2.7	No	No
La Pata Avenue and Avenida Pico	24 / 24	0.1 / 0.0	3.5 / 3.6	2.6 / 2.6	No	No
	24 / 24	0.1 / 0.0	3.5 / 3.6	2.6 / 2.6	No	No
	22 / 22	0.0 / 0.0	3.5 / 3.5	2.6 / 2.6	No	No
	22 / 22	0.1 / 0.1	3.4 / 3.5	2.5 / 2.6	No	No
I-5 NB ramps and Avenida Vista Hermosa	14 / 14	0.0 / 0.0	4.3 / 4.3	3.1 / 3.1	No	No
	14 / 14	0.0 / 0.0	4.0 / 4.0	2.9 / 2.9	No	No
	12 / 12	0.0 / 0.0	4.0 / 4.0	2.9 / 2.9	No	No
	12 / 12	0.0 / 0.0	3.9 / 3.9	2.8 / 2.8	No	No
I-5 NB ramps and Avenida Pico	15 / 15	-0.1 / -0.1	4.5 / 4.4	3.3 / 3.2	No	No
	14 / 14	0.0 / 0.0	4.3 / 4.3	3.1 / 3.1	No	No
	14 / 14	0.0 / 0.0	4.3 / 4.3	3.1 / 3.1	No	No
	14 / 14	-0.1 / 0.0	4.3 / 4.2	3.1 / 3.1	No	No

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

¹ Includes the ambient 1-hour concentration of 2.7 ppm and ambient 8-hour concentration of 2 ppm. Measured at the Mission Viejo Air Monitoring Station at 26081 Via Pera, Mission Viejo, California (Orange County).

² The 1-hour CO State standard is 20 ppm, and the 8-hour CO standard is 9 ppm.

CO = carbon monoxide

I-5 = Interstate 5

NB = northbound

ppm = parts per million

SR-74 = State Route 74

Table 4.3.10: 2035 CO Concentrations¹

Intersection	Receptor Distance to Road Centerline (meters)	Project-Related Increase 1-Hr/8-Hr (ppm)	Without/With Project 1-Hr CO Concentration (ppm)	Without/With Project 8-Hr CO Concentration (ppm)	Exceeds State Standards? ²	
					1-Hr	8-Hr
La Pata Avenue and SR-74	24 / 24	0.0 / 0.0	3.4 / 3.4	2.5 / 2.5	No	No
	24 / 24	0.1 / 0.1	3.3 / 3.4	2.4 / 2.5	No	No
	22 / 22	0.0 / 0.0	3.3 / 3.3	2.4 / 2.4	No	No
	15 / 21	0.0 / 0.0	3.3 / 3.3	2.4 / 2.4	No	No
La Pata Avenue and Camino Del Rio	14 / 14	0.6 / 0.4	2.7 / 3.3	2.0 / 2.4	No	No
	14 / 14	0.5 / 0.4	2.7 / 3.2	2.0 / 2.4	No	No
	10 / 10	0.5 / 0.4	2.7 / 3.2	2.0 / 2.4	No	No
	10 / 10	0.5 / 0.4	2.7 / 3.2	2.0 / 2.4	No	No
La Pata Avenue and Avenida Vista Hermosa	24 / 24	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
	21 / 22	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
	19 / 21	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
	19 / 19	0.1 / 0.1	3.1 / 3.2	2.3 / 2.4	No	No
Camino Vera Cruz and Avenida Vista Hermosa	17 / 17	-0.1 / 0.0	3.3 / 3.2	2.4 / 2.4	No	No
	15 / 17	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
	15 / 15	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
	15 / 15	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
La Pata Avenue and Avenida Pico	24 / 24	0.1 / 0.0	3.2 / 3.3	2.4 / 2.4	No	No
	22 / 24	0.0 / 0.0	3.2 / 3.2	2.4 / 2.4	No	No
	22 / 22	0.1 / 0.1	3.1 / 3.2	2.3 / 2.4	No	No
	22 / 22	0.1 / 0.1	3.1 / 3.2	2.3 / 2.4	No	No
I-5 NB ramps and Avenida Vista Hermosa	14 / 14	0.0 / 0.0	3.4 / 3.4	2.5 / 2.5	No	No
	14 / 12	0.0 / 0.0	3.3 / 3.3	2.4 / 2.4	No	No
	12 / 12	0.0 / 0.0	3.3 / 3.3	2.4 / 2.4	No	No
	12 / 12	0.0 / 0.0	3.3 / 3.3	2.4 / 2.4	No	No
I-5 NB ramps and Avenida Pico	15 / 15	0.0 / 0.0	3.5 / 3.5	2.6 / 2.6	No	No
	14 / 14	0.0 / 0.0	3.4 / 3.4	2.5 / 2.5	No	No
	14 / 14	0.0 / 0.0	3.4 / 3.4	2.5 / 2.5	No	No
	14 / 14	0.0 / 0.0	3.4 / 3.4	2.5 / 2.5	No	No

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

¹ Includes the ambient 1-hour concentration of 2.7 ppm and ambient 8-hour concentration of 2 ppm. Measured at the Mission Viejo Air Monitoring Station at 26081 Via Pera, Mission Viejo, California (Orange County).

² The 1-hour CO State standard is 20 ppm, and the 8-hour CO standard is 9 ppm.

CO = carbon monoxide

I-5 = Interstate 5

NB = northbound

ppm = parts per million

SR-74 = State Route 74

4.3.5.2 Potentially Significant Impacts

Threshold 4.3.2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Threshold 4.3.3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

Threshold 4.3.4: Expose sensitive receptors to substantial pollutant concentrations?

Construction Emissions. Air pollutant emissions associated with the project would occur over the short term from construction activities and would include fugitive dust from site preparation and grading and emissions from equipment exhaust. During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most roadway projects are greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils.

Peak-day construction emissions are summarized in Table 4.3.11. As shown, the construction emissions would exceed the SCAQMD's CEQA thresholds for criteria pollutants during the mass grading phase. Table 4.3.12 summarizes the total construction emissions, in tons, generated during the proposed project's 30-month construction schedule.

Table 4.3.11: Peak-Day Construction Emissions (lbs/day) by Phase¹

Construction Phase	CO	ROGs	NO _x	PM ₁₀ ²	PM _{2.5} ²
Grubbing/Land Clearing	59	15	99	105	25
Grading/Excavation	1,100	86	270	110	31
Drainage/Utilities/Subgrade	38	9.4	55	103	24
Paving	33	8.2	39	3.3	3.0
SCAQMD Emissions Threshold	550	75	100	150	55
Exceed Significance?	Yes	Yes	Yes	No	No

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

¹ It is assumed that there is no overlap of these construction phases.

² The total PM₁₀ and PM_{2.5} daily emissions rate with fugitive dust mitigation measures implemented.

CO = carbon monoxide

lbs/day = pounds per day

N/A = not applicable

NO_x = oxides of nitrogen

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

ROGs = reactive organic gases

SCAQMD = South Coast Air Quality Management District

Table 4.3.12: Total Construction Emissions (tons)

	CO	ROGs	NO _x	PM ₁₀ ¹	PM _{2.5} ¹
Total Construction	228	19	61	30	8

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

¹ The total PM₁₀ and PM_{2.5} daily emissions rate with fugitive dust mitigation measures implemented.

CO = carbon monoxide

NO_x = oxides of nitrogen

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

ROGs = reactive organic gases

Mitigation Measures 4.3-1 through 4.3-6 would be required to reduce construction emissions; however, even with implementation of all available mitigation measures, project impacts related to construction emissions would remain significant and unavoidable.

Localized Significance. The nearest sensitive receptors are located along Camino Del Rio within 15 meters (50 feet) of the active construction areas. The shortest distance for LST analyses is 25 meters (80 feet). Therefore, the construction emissions for each phase of the proposed project's construction were compared to the 25-meter LST thresholds. Table 4.3.13 shows the construction-related emissions of NO_x, CO, PM₁₀, and PM_{2.5} compared to the LSTs for the Capistrano Valley area. As shown in Table 4.3.13, the NO_x, PM₁₀, and PM_{2.5} emissions would exceed the LST thresholds.

Table 4.3.13: Summary of Construction Emissions Localized Significance

Phase	Daily Emissions Rate (lbs/day)			
	CO	NO _x	PM ₁₀	PM _{2.5}
Grubbing/Land Clearing	59	99	105	25
Grading/Excavation	1,100	270	110	31
Drainage/Utilities/Subgrade	38	55	103	24
Paving	33	39	3.3	3.0
LST (at 25 meters)	1,804	197	12	8
Exceed Significance?	No	Yes	Yes	Yes

Source: *Air Quality Assessment Report*, LSA Associates, Inc. (October 2010).

CO = carbon monoxide

NO_x = oxides of nitrogen

PM₁₀ = particulate matter less than 10 microns in diameter

PM_{2.5} = particulate matter less than 2.5 microns in diameter

LST = localized significance threshold

Mitigation Measures 4.3-1 through 4.3-6 would be required to reduce construction emissions; however, even with implementation of all available mitigation measures, project impacts related to construction emissions would remain significant and unavoidable.

Threshold 4.3.5: Create objectionable odors affecting a substantial number of people?

Construction Emissions. Some objectionable odors may emanate from the operation of diesel-powered construction equipment during the construction of the proposed project. The closest existing residences in the vicinity of the project area are located along an approximately 400-foot length of Camino Del Rio at approximately 50 feet from the project construction area. These odors would be limited to the short-term construction period of the project and are not expected to be substantial, although they may be noticeable at times. *Implementation of Mitigation Measures 4.3-3 and 4.3-4 would reduce emissions from construction equipment. Therefore, the proposed project would not have a significant impact related to odors with incorporation of mitigation.*

4.3.5.3 Mitigation Measures

The following measures are required for air quality impacts during construction:

4.3-1 During all project construction, and as verified by the County Director of Public Works or designee, the project contractor shall comply with the South Coast Air Quality Management (SCAQMD) Rules 402 and 403 to assist in reducing short-term air pollutant emissions. Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Rule 402 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site. Applicable dust suppression techniques from Rule 403 are summarized below. Prior to commencement of grading activities, the County Director of Public Works or designee shall ensure that notes are included on grading and construction plans and referenced in the construction contractor's agreement that the construction contractor shall be responsible for compliance with Rules 402 and 403.

The applicable Rule 403 measures are as follows:

- Apply nontoxic chemical soil stabilizers according to manufacturers specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).
- Water active sites at least twice daily. (Locations where grading is to occur would be thoroughly watered prior to earth moving.)
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered, or should maintain at least 2 feet of freeboard (vertical space between the top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code (CVC) Section 23114.
- Traffic speeds on all unpaved roads shall be reduced to 15 miles per hour (mph) or less.

4.3-2 Prior to commencement of grading activities, the County Director of Public Works or designee shall ensure that notes are included on construction and grading plans and

referenced in the contractor's agreement that requires use of dust suppression measures in the SCAQMD *California Environmental Quality Act (CEQA) Air Quality Handbook* during project grading and construction. During all construction activities, and as verified by the County Director of Public Works or designee, the construction contractor shall be responsible for the implementation of following dust suppression measures:

- Revegetate disturbed areas as quickly as possible.
- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph.
- Sweep all streets once per day if visible soil materials are carried to adjacent streets (water sweepers with reclaimed water are recommended).
- Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash trucks and any equipment leaving the site each trip.
- Pave all on-site roads as soon as feasible, water them periodically, or chemically stabilize them.
- Minimize the area disturbed by clearing, grading, earthmoving, or excavation operations at all times.

- 4.3-3** Prior to commencement of grading activities, the County Director of Public Works or designee shall ensure that construction documents require the construction contractor to select the construction equipment used on site based on low-emission factors and high energy efficiency. Prior to commencement of grading activities, the County Director of Public Works or designee shall also verify that the grading plans include a statement that the construction contractor shall ensure that all construction equipment is tuned and maintained in accordance with manufacturer specifications.
- 4.3-4** Prior to issuance of a Notice to Proceed, the County Director of Public Works or designee shall verify that construction contracts and/or grading plans include a statement that work crews will shut off equipment when not in use.
- 4.3-5** Prior to issuance of a Notice to Proceed, the County Director of Public Works or designee shall verify that construction contracts and/or grading plans include a statement that the construction contractor shall time the construction activities so as to not interfere with peak-hour traffic and minimize obstruction of through traffic lanes adjacent to the site; if necessary, a flagger shall be retained to maintain safety adjacent to existing roadways.
- 4.3-6** Prior to issuance of a Notice to Proceed, the County Director of Public Works or designee shall verify that construction contracts and/or grading plans include a statement that the construction contractor shall support and encourage ride-sharing and transit incentives for the construction crew.

4.3.6 Cumulative Impacts

Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from vehicular traffic that can travel well beyond the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any, local projects and, when wind patterns are considered, would cover an even larger area. Accordingly, the cumulative analysis for a project's air quality analysis is regional by nature.

Construction and operation of cumulative projects would further degrade the local air quality, as well as the air quality of the SCAB. Air quality would be temporarily degraded during construction activities that occur separately or simultaneously. However, the cumulative projects identified in Section 4.1, Land Use, are not known to be scheduled for construction at the same time as the proposed project. For example, construction of the proposed Target store and Sports Park (Aquatic Center) is anticipated to occur prior to the proposed project construction, and the transportation projects are expected to be underway after the proposed project. However, this EIR acknowledges that construction schedules may vary, and some overlap of construction activities may occur. There is a potential for the proposed project's construction emissions to significantly contribute to cumulative short-term air quality impacts.

The greatest cumulative impact on the quality of regional air would be the incremental addition of pollutants from increased traffic from residential, commercial, and industrial development and the use of heavy equipment and trucks associated with the construction of these projects. Note that the proposed project is a transportation improvement and does not generate new trips.

Based on the regional vehicle emissions analysis, the proposed project would not contribute to long-term regional emissions and therefore would not result in, or contribute to, a cumulatively significant air quality impact.

4.3.7 Level of Significance after Mitigation

Implementation of the standard conditions and mitigation measures provided above would reduce air quality impacts during construction to the extent feasible. However, the adverse air quality impacts during project construction would remain significant and unavoidable after mitigation.