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## 4.8 AIR QUALITY

### 4.8.1 INTRODUCTION

The project site is located within the City of Long Beach, which is part of the South Coast Air Basin (Basin) and is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The air quality assessment for the proposed project includes estimating emissions associated with short-term construction and long-term operation of the proposed project.

A number of air quality modeling tools are available to assess air quality impacts of projects. In addition, certain air districts, such as the SCAQMD, have created guidelines and requirements to conduct air quality analyses. The SCAQMD's current guidelines, included in its CEQA Air Quality Handbook, April 1993, were adhered to in the assessment of air quality impacts for the proposed project.

### 4.8.2 EXISTING ENVIRONMENTAL SETTING

#### Regional Air Quality

Both the State of California (State) and the federal government have established health-based ambient air-quality standards (AAQS) for six air pollutants. As shown in Table 4.8.A, these pollutants include ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter with a diameter of 10 microns or less (PM<sub>10</sub>), and lead. In July 1997, the U.S. Environmental Protection Agency (EPA) adopted new standards for eight-hour ozone and for fine particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to setting out primary and secondary AAQS, the State has established a set of episode criteria for O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, and PM<sub>10</sub>. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three. Table 4.8.B lists the health effects of these criteria pollutants and their potential sources. These health effects would not occur unless the standards are exceeded by a large margin or for a prolonged period of time. The State AAQS are more stringent than the federal AAQS.

The California Clean Air Act (CCAA) provides the SCAQMD with the authority to manage transportation activities at indirect sources. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution. Examples of this would be the motor vehicles at an intersection, a mall, and on highways. The SCAQMD also regulates stationary sources of pollution throughout its jurisdictional area. Direct emissions from motor vehicles are regulated by the California Air Resources Board (ARB).

**Table 4.8.A: Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards <sup>1</sup>		Federal Standards <sup>2</sup>		
		Concentration <sup>3</sup>	Method <sup>4</sup>	Primary <sup>3,5</sup>	Secondary <sup>3,6</sup>	Method <sup>7</sup>
Ozone (O <sub>3</sub> )	1-Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Ultraviolet Photometry	0.12 ppm (235 µg/m <sup>3</sup> ) <sup>8</sup>	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	--		0.08 ppm (157 µg/m <sup>3</sup> ) <sup>8</sup>		
Respirable Particulate Matter (PM <sub>10</sub> )	24-Hour	50 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	150 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>		50 µg/m <sup>3</sup>		
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	No Separate State Standard		65 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	15 µg/m <sup>3</sup>		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m <sup>3</sup> )	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m <sup>3</sup> )	None	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m <sup>3</sup> )		35 ppm (40 mg/m <sup>3</sup> )		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m <sup>3</sup> )		--		
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Arithmetic Mean	--	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.25 ppm (470 µg/m <sup>3</sup> )		--		
Sulfur Dioxide (SO <sub>2</sub> )	Annual Arithmetic Mean	--	Ultraviolet Fluorescence	0.030 ppm (80 µg/m <sup>3</sup> )	--	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m <sup>3</sup> )		0.14 ppm (365 µg/m <sup>3</sup> )	--	
	3-Hour	--		--	0.5 ppm (1300 µg/m <sup>3</sup> )	
	1-Hour	0.25 ppm (655 µg/m <sup>3</sup> )		--	--	
Lead <sup>9</sup>	30 Day Average	1.5 µg/m <sup>3</sup>	Atomic Absorption	--	--	High Volume Sampler and Atomic Absorption
	Calendar Quarter	--		1.5 µg/m <sup>3</sup>	Same as Primary Standard	
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.		<b>No Federal Standards</b>		
Sulfates	24-Hour	25 µg/m <sup>3</sup>	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m <sup>3</sup> )	Ultraviolet Fluorescence			
Vinyl Chloride <sup>9</sup>	24-Hour	0.01 ppm (26 µg/m <sup>3</sup> )	Gas Chromatography			

Source: ARB (July 2003).

Footnotes:

- <sup>1</sup> California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1 and 24 hour); nitrogen dioxide; suspended particulate matter, PM<sub>10</sub>; 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.
- <sup>2</sup> National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m<sup>3</sup> is equal to or less than one. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
- <sup>3</sup> 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.
- <sup>4</sup> Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
- <sup>5</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- <sup>6</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- <sup>7</sup> 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.
- <sup>8</sup> New federal eight-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18, 1997. Contact U.S. EPA for further clarification and current federal policies.
- <sup>9</sup> 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.

**Table 4.8.B: Summary of Health Effects of the Major Criteria Air Pollutants**

<b>Pollutants</b>	<b>Sources</b>	<b>Primary Effects</b>
Ozone (O <sub>3</sub> )	Atmospheric reaction of organic gases with nitrogen oxides in the presence of sunlight.	Aggravation of respiratory and cardiovascular diseases. Irritation of eyes. Impairment of cardiopulmonary function. Plant leaf injury.
Nitrogen Dioxide (NO <sub>2</sub> )	Motor vehicle exhaust. High temperature stationary combustion. Atmospheric reactions.	Aggravation of respiratory illness. Reduced visibility. Reduced plant growth. Formation of acid rain.
Carbon Monoxide (CO)	By-products from incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. Natural events, such as decomposition of organic matter.	Reduced tolerance for exercise. Impairment of mental function. Impairment of fetal development. Death at high levels of exposure. Aggravation of some heart diseases (angina).
Suspended Particulate Matter (PM <sub>2.5</sub> and PM <sub>10</sub> )	Stationary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Reduced lung function. Aggravation of the effects of gaseous pollutants. Aggravation of respiratory and cardiorespiratory diseases. Increased cough and chest discomfort. Soiling. Reduced visibility.
Sulfur Dioxide (SO <sub>2</sub> )	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	Aggravation of respiratory diseases (asthma, emphysema). Reduced lung function. Irritation of eyes. Reduced visibility. Plant injury. Deterioration of metals, textiles, leather, finishes, coatings, etc.
Lead (Pb)	Contaminated soil (e.g., from leaded fuels and lead-based paints).	Impairment of blood function and nerve construction. Behavioral and hearing problems in children.

Source: ARB 2001.

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

Climate in the Basin is determined by its terrain and geographical location. The Basin 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 Basin. The Basin lies in the semi-permanent 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, or Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s, measured in degrees Fahrenheit. 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 Long Beach WSCMO Station.<sup>1</sup> The monthly average maximum temperature recorded at this station from April 1958 to July 2003 ranged from 66.9°F in January to 84.1°F in August, with an annual average maximum of 74.3°F. The monthly average minimum temperature recorded at this station ranged from 45.5°F in January to 64.9°F in August, with an annual average minimum of 54.7°F. January is typically the coldest month, and August is typically the warmest month in this area of the Basin.

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thunder showers in coastal regions and slightly heavier showers in the eastern portion of the Basin and along the coastal side of the mountains. The Long Beach WSCMO Station climatological station monitored precipitation from April 1958 to July 2003. Average monthly rainfall measured in Long Beach during that period varied from 2.85 inches in February to 0.29 inch or less between May and October, with an annual total of 11.97 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

Although the Basin 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 Basin. Summer wind flow patterns represent worst-case conditions, because this is the period of higher temperatures and more sunlight, which results in O<sub>3</sub> formation.

Winds in the Long Beach area are almost always driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction, traveling toward the sea. Wind direction is altered by local canyons, with wind tending to flow parallel to the canyons. During the transition period from one

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<sup>1</sup> Western Regional Climate Center, [www.wrcc@dri.edu](http://www.wrcc@dri.edu).

wind pattern to another, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south. The frequency of calm winds (i.e., less than two miles per hour) is less than 10 percent. Therefore, there is little stagnation in the vicinity of the project, especially during busy daytime traffic hours.

During spring and early summer, pollution produced during any one day is typically blown out of the Basin through mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. Air contaminants can be transported 60 miles or more from the Basin by ocean air during the afternoons. From early fall to winter, the transport is less pronounced because of slower average wind speed 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 Basin 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 Basin and are about 25 percent more likely along the coast. The vertical dispersion of air pollutants in the Basin 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 CO and NO<sub>x</sub> 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<sub>x</sub> to form photochemical smog.

**Air Pollution Constituents and Attainment Status.** The following describes the six criteria air pollutants and their attainment status in the Basin based on ARB's Area Designations (Activities and Maps) (<http://www.arb.ca.gov/desig/desig.htm>). ARB provided the EPA with California's recommendations for eight-hour ozone area designations on July 15, 2003. The recommendations and supporting data were an update to a report submitted to the EPA in July 2000. On December 3, 2003, the EPA published its proposed designations. The EPA's proposal differs from the State's recommendations primarily on the appropriate boundaries for several nonattainment areas. ARB

responded to the EPA's proposal on February 4, 2004. The EPA issued the final designations for the eight-hour zone on April 15, 2004.

Table 4.8.C summarizes the attainment status in the Basin for the major criteria pollutants.

**Table 4.8.C: Attainment Status of Criteria Pollutants in the South Coast Air Basin**

Pollutant	State	Federal
O <sub>3</sub> 1-hour	Nonattainment	Extreme Nonattainment
O <sub>3</sub> 8-hour	Not Applicable (no State standard)	Severe-17 Nonattainment
PM <sub>10</sub>	Nonattainment	Serious Nonattainment
PM <sub>2.5</sub>	Not Applicable (not established)	Nonattainment (preliminary)
CO	Attainment (except Los Angeles County)	Attainment (data finding in 2003 AQMP)
NO <sub>2</sub>	Attainment	Attainment/Maintenance
SO <sub>2</sub>	Attainment	Attainment
Lead	Attainment	Attainment
All others	Attainment/Unclassified	Attainment/Unclassified

Source: ARB 2004.

**Ozone.** O<sub>3</sub> (smog) is formed by photochemical reactions between NO<sub>x</sub> and reactive organic gases (ROG) rather than being directly emitted. O<sub>3</sub> is a pungent colorless gas typical of Southern California smog. Elevated O<sub>3</sub> 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. O<sub>3</sub> levels peak during summer and early fall. The entire Basin is designated as a nonattainment area for both federal and State one-hour O<sub>3</sub> standards. The EPA has classified the Basin as an "extreme" nonattainment area for the one-hour O<sub>3</sub> standard and has mandated that the Basin achieve attainment by 2010. As previously stated, the EPA officially designated the Basin's attainment status as being severe-17 nonattainment for the eight-hour O<sub>3</sub> standard on April 15, 2004.

**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 impairment to central nervous system functions. Although the SCAQMD has not officially requested the redesignation of CO attainment status from the EPA, it has stated in the 2003 AQMP that recent data collected in the entire Basin have not exceeded any federal CO standards. The Los Angeles County portion of the SCAQMD district (which includes Long Beach) has been designated by the ARB to be a nonattainment-transitional area for State CO standards.

**Nitrogen Oxides.** NO<sub>2</sub>, a reddish-brown gas, and nitric oxide (NO), a colorless odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NO<sub>x</sub>. NO<sub>x</sub> is a primary component of the photochemical smog reaction. It also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition (i.e., acid rain). NO<sub>2</sub> decreases lung function and may reduce resistance to infection. No areas of the Basin have exceeded both federal and State standards for NO<sub>2</sub> in the past five years with published monitoring data. It is designated as a maintenance area under the federal standards and an attainment area under the State standards.

**Sulfur Dioxide.** SO<sub>2</sub> is a colorless irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO<sub>2</sub> levels. SO<sub>2</sub> irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight. The entire Basin is in attainment with both federal and State SO<sub>2</sub> standards.

**Lead.** Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the blood stream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead. The entire Basin is in attainment for the federal and State standards for lead.

**Particulate Matter.** Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles, PM<sub>10</sub>, derive 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 particle (PM<sub>2.5</sub>) levels. Fine particles can also be formed in the atmosphere through chemical reactions. PM<sub>10</sub> can accumulate in the respiratory system and aggravate health problems such as asthma. The EPA's scientific review concluded that PM<sub>2.5</sub>, which penetrates deeply into the lungs, is more likely than PM<sub>10</sub> 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 PM<sub>10</sub> standards. These health effects include premature death and increased hospital admissions and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individuals with cardiopulmonary disease such as asthma); decreased lung functions (particularly in children and individuals with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms. The entire Basin is a nonattainment area for the federal and State PM<sub>10</sub> standards. The attainment status of PM<sub>2.5</sub> in the Basin was not officially established by the EPA or the ARB at the time this analysis was prepared. However, based on the monitored data, the Basin is likely to be designated as a nonattainment area for PM<sub>2.5</sub>.

## Local Air Quality

The SCAQMD, together with the ARB, maintains ambient air quality monitoring stations in the Basin. The air quality monitoring station closest to the site is the North Long Beach station, and its air

quality trends are representative of the ambient air quality in the project area. The pollutants monitored are CO, O<sub>3</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, and SO<sub>2</sub>.<sup>1</sup>

The ambient air quality data in Table 4.8.D shows that NO<sub>2</sub>, SO<sub>2</sub>, and CO levels are below the relevant State and federal standards at the North Long Beach station. The federal one-hour O<sub>3</sub> standard was exceeded one day in the last 5 years and the State standard from zero to three days in each of the last 5 years. The federal eight-hour O<sub>3</sub> standard has not been exceeded since 1994. The State 24-hour PM<sub>10</sub> standard was exceeded from five to 13 days in each of the last five years but has not exceeded the federal 24-hour standard since 1984. The federal 24-hour PM<sub>2.5</sub> standard has not been exceeded for the last two years and in prior years was exceeded from one to four days each year. Both the State and federal annual average PM<sub>2.5</sub> standards have been exceeded every year since monitoring began in 1999.

## Regulatory Settings

**Federal Regulations/Standards.** 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.

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

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 Basin.

The EPA established new national air quality standards for ground-level O<sub>3</sub> and PM<sub>2.5</sub> matter 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 O<sub>3</sub> and particulate matter, was unconstitutional as an improper delegation of legislative authority to the EPA. On February 27, 2001, the U.S. 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 O<sub>3</sub> and soot in 1997. Nevertheless, the court threw out the EPA’s policy for implementing new O<sub>3</sub> rules, saying that the agency ignored a section of the law that restricts its authority to enforce such rules.

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<sup>1</sup> Air quality data, 1999–2003; EPA and ARB Web sites.

**Table 4.8.D: Ambient Air Quality at the North Long Beach Air Monitoring Station**

Pollutant	Standard	2003	2002	2001	2000	1999
<b>Carbon Monoxide (CO)</b>						
Max 1-hr concentration (ppm)		5.5	5.8	6.0	9.7	7.5
No. days exceeded: State	> 20 ppm/1-hr	0	0	0	0	0
Federal	> 35 ppm/1-hr	0	0	0	0	0
Max 8-hr concentration (ppm)		4.7	4.6	4.7	5.7	5.5
No. days exceeded: State	≥ 9.0 ppm/8-hr	0	0	0	0	0
Federal	≥ 9 ppm/8-hr	0	0	0	0	0
<b>Ozone (O<sub>3</sub>)</b>						
Max 1-hr concentration (ppm)		0.099	0.084	0.091	0.188	0.131
No. days exceeded: State	> 0.09 ppm/1-hr	1	0	0	3	3
Federal	> 0.12 ppm/1-hr	0	0	0	0	1
Max 8-hr concentration (ppm)		0.068	0.064	0.070	0.081	0.081
No. days exceeded: Federal	> 0.08 ppm/8-hr	0	0	0	0	0
<b>Particulates (PM<sub>10</sub>)</b>						
Max 24-hr concentration (μg/m <sup>3</sup> )		63	74	91	105	79
No. days exceeded: State	> 50 μg/m <sup>3</sup> /24-hr	10	5	10	12	13
Federal	> 150 μg/m <sup>3</sup> /24-hr	0	0	0	0	0
Annual Arithmetic Average (μg/m <sup>3</sup> )		34	36	37	38	39
Exceeded: State	> 20 μg/m <sup>3</sup> ann. arth. avg.	Yes	Yes	Yes	Yes	Yes
Federal	> 50 μg/m <sup>3</sup> ann. arth. avg.	No	No	No	No	No
<b>Particulates (PM<sub>2.5</sub>)</b>						
Max 24-hr concentration (μg/m <sup>3</sup> )		46.5	62.7	72.9	81.5	66.9
No. days exceeded: Federal	> 65 μg/m <sup>3</sup> /24-hr	0	0	1	4	1
Annual Arithmetic Average (μg/m <sup>3</sup> )		15.5	19.5	21.2	19.6	20.7
Exceeded: State	> 12 μg/m <sup>3</sup> ann. arth. avg.	Yes	Yes	Yes	Yes	Yes
Federal	> 15 μg/m <sup>3</sup> ann. arth. avg.	Yes	Yes	Yes	Yes	Yes
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>						
Max 1-hr concentration (ppm)		0.135	0.130	0.122	0.140	0.151
No. days exceeded: State	> 0.25 ppm/1-hr	0	0	0	0	0
Annual arithmetic average concentration (ppm)		0.026	0.029	0.030	0.032	0.034
Exceeded: Federal	> 0.053 ppm ann. arth. avg.	No	No	No	No	No
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>						
Max 1-hr concentration (ppm)		0.033	0.030	0.047	0.047	0.050
No. days exceeded: State	> 0.25 ppm/1-hr	0	0	0	0	0
Max 3-hr concentration (ppm)		0.020	0.026	0.027	0.036	0.030
No. days exceeded: Federal	> 0.5 ppm/3-hr	0	0	0	0	0
Max 24-hr concentration (ppm)		0.008	0.008	0.009	0.011	0.011
No. days exceeded: State	> 0.04 ppm/24-hr	0	0	0	0	0
Federal	> 0.14 ppm/24-hr	0	0	0	0	0
Annual arithmetic average concentration (ppm)		0.003	0.002	0.003	0.003	0.004
Exceeded: Federal	> 0.030 ppm ann. arth. avg.	No	No	No	No	No

Source: EPA and ARB 1999 to 2003

ppm = parts per million

μg/m<sup>3</sup> = microgram of pollutant per cubic meter of air

ann. arth. avg. = annual arithmetic average

In April 2003, the EPA was cleared by the White House Office of Management and Budget (OMB) to implement the eight-hour ground-level O<sub>3</sub> standard. The EPA issued the proposed rule implementing the eight-hour O<sub>3</sub> standard in April 2003. On April 15, 2004, the EPA issued the final designations for the eight-hour ozone standards for the State of California.

The EPA plans to issue the final PM<sub>2.5</sub> implementation rule in September 2004. The EPA is then expected to make final designations on December 15, 2004.

**State Regulations/Standards.** The State began to set California ambient air quality standards (CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are also listed in Table 4.8.A.

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

The attainment plans are required to achieve a minimum 5 percent annual reduction in the emissions of nonattainment pollutants unless all feasible measures have been implemented. The Basin is currently classified as a nonattainment area for four criteria pollutants.

**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.

The ARB coordinates and oversees both State and federal air pollution control programs in California. The ARB oversees activities of local air quality management agencies and is responsible for incorporating air quality management plans for local air basins into a State Implementation Plan (SIP) for EPA approval. The ARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by the ARB to classify air basins as "attainment" or "nonattainment" with respect to each pollutant and to monitor progress in attaining air quality standards. The 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 the SCAG are responsible for formulating and implementing the AQMP for the Basin. Every three years the SCAQMD prepares a new AQMP, updating the previous plan and having a twenty-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to ARB for review and approval. The 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 O<sub>3</sub> and PM<sub>10</sub>; replaces the 1997 attainment demonstration for the federal CO standard; provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal NO<sub>2</sub> standard that the Basin has met since 1992.

This revision to the 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. The 2003 AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the Ozone SIP for the South Coast Air Basin for the attainment of the federal ozone air quality standard. However, this revision points to the urgent need for additional emissions reductions (beyond those incorporated in the 1997/99 Plan) from all sources, specifically those under the jurisdiction of the ARB and the U.S. Environmental Protection Agency, which account for approximately 80 percent of the ozone precursor emissions in the Basin.

The 1999 Amendment to the 1997 Ozone SIP Revision for the South Coast Air Basin, adopted by the SCAQMD on December 10, 1999, and approved by the EPA in April 2000, is the most recent federally approved AQMP.

The 1999 Amendment provides additional short-term stationary source control measures that implement portions of the 1997 Ozone SIP's long-term stationary source control measures. In addition, the Amendment revises the adoption and implementation schedule for the remaining 1997 Ozone SIP short-term stationary source control measures that the AQMD is responsible to implement.

The 1999 Amendment addresses U.S. EPA concerns relative to the adoption schedule for the 1997 Ozone SIP Revision short-term control measures and the increased reliance on long-term control measures. The U.S. EPA indicated in a letter to the Governing Board that it believes the 1999 Amendment would be approvable and would expedite the review and approval process.

The 1999 Amendment does not revise the PM<sub>10</sub> portion of the 1997 AQMP, emission inventories, the mobile source portions of the 1997 Ozone SIP Revision, or the ozone attainment demonstration. However, with the new short-term stationary source control measures, additional emission reductions are projected to occur in the near-term.

Specifically, the 1999 Amendment:

- includes new short-term stationary source control measures;
- revises the adoption/implementation schedule for 13 short-term VOC and NO<sub>x</sub> stationary source control measures from the 1997 Ozone SIP Revision;
- provides further VOC emission reductions in the near-term; and
- revises the emission reduction commitments for the long-term control measures in the 1997 Ozone SIP Revision long-term stationary source control measures that the SCAQMD is responsible to implement.

### 4.8.3 METHODOLOGY

The proposed project is located within the SCAQMD's air quality jurisdiction. Therefore, the emission thresholds established by the SCAQMD were adhered to in the assessment of air quality impacts for the proposed project.

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

CO concentrations were predicted for the Existing (2004), year 2006 no project, and year 2006 plus project scenarios, based on traffic data provided in the traffic study (LLG, March 2004) for this project. CALINE4, the fourth generation California Line Source Dispersion Model developed by the California Department of Transportation (Caltrans), was used. Input data for this model include meteorology, street network geometrics, traffic information, and emission generation rates. Meteorological data required include temperature, sigma theta (standard deviation of wind direction change), wind direction, and wind speed. Street network geometrics require use of an x, y coordinate system onto which the modeled roadway can be overlaid in order to identify the relative locations of the traffic lane(s) and nearby receptor(s). Required traffic information included peak-hour traffic volumes, speed limit, level of service, and signal cycle times. Emission factors were calculated using the CARB EMFAC2002 emission factors.

Output from the model includes one-hour CO concentrations in parts per million (ppm) at selected receptor locations. To reflect total concentrations, the ambient CO concentration of the vicinity must be added to the CO concentration predicted by CALINE4. Based on the methodology suggested by the EPA and included in Caltrans CO Protocol (December 1997), the existing ambient concentration was determined as the higher of the second highest annual one-hour and annual eight-hour observation at the nearest representative monitoring station over the past two years. Ambient concentrations for the year 2006 with and without project are assumed to be the same as the existing levels for the worst-case scenario. The predicted CALINE4 concentration is calculated for the one-hour averaging time. The one-hour CO concentrations predicted by CALINE4 were multiplied by a persistence factor of 0.7 to determine the predicted eight-hour CO concentrations.

Regional emissions were calculated from motor vehicles. Predictions for air pollutant emissions generated by the project traffic were calculated with the URBEMIS2002 model, based on the trip generations projected for the project from the traffic study (LLG, March 2004). Emissions from stationary sources such as natural gas usage were also calculated with URBEMIS2002.

Health risks to the users of the Sports Park from diesel truck traffic on the I-405 were predicted by using Caltrans data for existing truck traffic to predict traffic volumes in 2015. These volumes plus EMFAC2002 emission factors for 2010 were inputted into the HARP health risk model to calculate both carcinogenic and chronic risks.

#### 4.8.4 THRESHOLDS OF SIGNIFICANCE CRITERIA

A project would normally be considered to have a significant effect on air quality if the project would

- violate any AAQS,
- contribute substantially to an existing air quality violation,
- expose sensitive receptors to substantial pollutants concentrations, or
- conflict with adopted environmental plans and goals of the community in which it is located.

In addition to the federal and State AAQS, there are daily and quarterly emissions thresholds for construction and operation of a proposed project in the Basin. The Basin is administered by the SCAQMD, and guidelines and emissions thresholds established by the SCAQMD in its CEQA Air Quality Handbook (SCAQMD, April 1993) are used in this analysis.

##### Thresholds for Construction Emissions

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

- 75 pounds per day or 2.5 tons per quarter of reactive organic compounds (ROC)
- 100 pounds per day or 2.5 tons per quarter of NO<sub>x</sub>
- 550 pounds per day or 24.75 tons per quarter of CO
- 150 pounds per day or 6.75 tons per quarter of PM<sub>10</sub>
- 150 pounds per day or 6.75 tons per quarter of sulfur oxides (SO<sub>x</sub>)

Projects in the Basin with construction-related emissions that exceed any of the emission thresholds should be considered to be significant under CEQA.

##### Thresholds for Operational Emissions

Following are the daily operational emissions “significance” thresholds for the Basin are as follows.

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

- 55 pounds per day of ROC
- 55 pounds per day of NO<sub>x</sub>
- 550 pounds per day of CO
- 150 pounds per day of PM<sub>10</sub>
- 150 pounds per day of SO<sub>x</sub>

**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 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 one-hour CO concentrations by 1.0 part per million (ppm) or more or eight-hour CO concentrations by 0.45 ppm or more. The following are applicable local emission concentration standards for CO:

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

## 4.8.5 IMPACTS AND MITIGATION MEASURES

### Construction Air Quality Impacts

Air quality impacts would occur during the construction of the proposed project from soil disturbance and equipment exhaust. Major sources of emissions during demolition, grading, and site preparation include exhaust emissions from construction vehicles and equipment and fugitive dust generated by construction vehicles and equipment traveling over exposed surfaces and demolition activities, as well as by soil disturbances from grading and backfilling. The following construction impact analysis summarizes construction emissions and associated impacts for the project site.

**Construction Equipment Emissions.** Grading and construction activities would cause combustion emissions from utility engines, heavy-duty construction vehicles, haul trucks, and vehicles transporting the construction crew. Exhaust emissions during grading and other construction activities envisioned on site vary daily as construction activity levels change. Peak grading days typically generate a larger amount of air pollutants than during other project construction days. It is anticipated that demolition of the existing structures will take approximately six to eight weeks. Implementation of the proposed project will require approximately 638,440 cubic yards of cut and 625,998 cubic yards of fill. It is anticipated that the cut and fill will be balanced on site and the difference in these estimated volumes is intended to accommodate a minor amount of “shrinkage” that will occur when the on-site soils are converted to compacted fill. At the present time, it is also anticipated that much of the concrete rubble produced during demolition will be crushed on site so that it can be incorporated in planned fills and/or used as a paving base for the proposed project improvements. Air quality allowances have also been made for truck export of demolition debris that cannot be crushed and/or incorporated in proposed fills and also for export of local layers or lenses of organic soil (i.e., peat) encountered during grading that are unsuitable for use in the proposed fills. Equipment required would include four dozers working 10 hours per day during peak days, two pieces of crushing equipment, two loaders working eight hours a day each, and haul trucks making a total of 60 trips per day traveling 30 miles each way.

Grading and construction of the playing fields, parking lots, and building pads will take approximately four to five months. Equipment required for grading would include two dozers working

10 hours per day during peak days, four scrapers working eight hours per day, haul trucks making a total of 40 trips per day traveling 30 miles each way, and two water trucks traveling 15 miles on site per day, as shown in Table 4.8.E. In addition, it is assumed there would be 30 workers on the site during demolition and 25 workers during grading, each traveling 40 miles per day to and from the site.

**Table 4.8.E: Emissions from Construction Equipment Exhaust—Demolition and Grading**

Source	Hours or Miles Per Day	Pollutants (Lbs/Day)				
		CO	ROC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
<b>Demolition</b>						
2 Dozers	10 hours	72	3.6	25	1.8	2.8
2 Loaders	8 hours	9.1	3.6	30	2.9	2.7
2 Crushing Equip.	8 hours	11	2.4	27	2.3	2.2
2 Hyd. Hammers, backhoe mounted	8 hours	11	2.4	27	2.3	2.2
2 Water Trucks	15 miles	0.58	0.066	0.83	0.009	0.021
60 Haul Truck Trips	30 miles each	42	4.7	60	0.63	1.5
30 Worker Trips	40 miles each	13.2	0.62	1.7	0.008	0.02
<b>Total Demolition</b>		<b>160</b>	<b>17</b>	<b>170</b>	<b>9.9</b>	<b>12</b>
<b>SCAQMD Threshold</b>		<b>550</b>	<b>75</b>	<b>100</b>	<b>150</b>	<b>150</b>
<b>Exceed Threshold?</b>		<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>No</b>
<b>Grading</b>						
2 Dozers	10 hours	72	3.6	25	1.8	2.8
4 Scrapers	8 hours	40	8.6	123	15	13
2 Water Trucks	15 miles	0.58	0.066	0.83	0.009	0.021
40 Haul Truck Trips	30 miles each	23	2.6	33	0.35	0.84
25 Worker Trips	40 miles each	22	1.0	2.9	0.01	0.04
<b>Total Grading</b>		<b>160</b>	<b>16</b>	<b>190</b>	<b>17</b>	<b>17</b>
<b>SCAQMD Threshold</b>		<b>550</b>	<b>75</b>	<b>100</b>	<b>150</b>	<b>150</b>
<b>Exceed Threshold?</b>		<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>No</b>

Source: LSA Associates, Inc., March 2004.

Table 4.8.E also summarizes peak daily emissions associated with construction equipment exhaust for the proposed project during the demolition and grading periods. Emissions during the building erection phase would be lower than the peak daily emissions presented in Table 4.8.E. Table 4.8.E shows that construction equipment/vehicle emissions during demolition and grading periods would only exceed the SCAQMD established daily and quarterly thresholds for NO<sub>x</sub>.

**Fugitive Dust.** Fugitive dust emissions are generally associated with demolition, land clearing, exposure, and cut and fill operations. Dust generated daily during construction would vary substantially, depending on the level of activity, the specific operations, and weather conditions. Nearby sensitive receptors (cemetery visitors) and on-site workers may be exposed to blowing dust,

depending upon prevailing wind conditions. Fugitive dust would also be generated as construction equipment or trucks travel on unpaved roads on the construction site.

The SCAQMD estimates that 21.8 pounds of PM<sub>10</sub> per hour would be generated from dirt/debris pushing per dozer/scrapper and 0.00042 lbs. of PM<sub>10</sub> per cubic foot of building volume from demolition. Since there is a relatively small number of structures on-site to demolish, and all of the site will require grading, maximum emissions will occur from grading operations during a peak construction day. Based on the construction assumptions for the proposed project and emission factors from the EPA AP-42 and the SCAQMD CEQA Air Quality Handbook, Table 4.8.F lists the fugitive dust emissions during the grading periods.

**Table 4.8.F: Peak Grading Day—Total Emissions (lbs/day)**

Category	CO	ROC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>
Vehicle/Equipment Exhaust (Table 4.8.E)	158	16	186	17	17
Fugitive Dust from 10 hours of Dozer Soil Disturbance: No Mitigation	—	—	—	—	1,308
Fugitive Dust from 10 hours of Dozer Soil Disturbance: with Mitigation	—	—	—	—	654
Total Grading: No Mitigation	158	16	186	17	1,325
Total Grading: With Mitigation	158	16	186	17	671
<b>SCAQMD Threshold</b>	<b>550</b>	<b>75</b>	<b>100</b>	<b>150</b>	<b>150</b>
<b>Exceeds SCAQMD Threshold?</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>

Source: LSA Associates, Inc., March 2004.

Table 4.8.F shows that without mitigation measures, fugitive dust emissions during the grading periods would exceed the SCAQMD threshold of 150 pounds per day during construction. With the implementation of standard conditions, such as frequent watering (e.g., a minimum of twice per day), fugitive dust emissions from construction activities are expected to be reduced by 50 percent or more; however, they would still exceed the SCAQMD threshold. Prior to grading, the City must obtain a Rule 1166 Permit related to release of airborne contaminants.

Table 4.8.E also lists total construction emissions (fugitive dust emissions and construction equipment exhausts) during the grading periods. Table 4.8.F shows that during peak grading days, daily total construction emissions of NO<sub>x</sub> and PM<sub>10</sub> would exceed the daily thresholds established by the SCAQMD even with mitigation measures implemented. Therefore, short-term construction impacts to air quality will be significant and adverse. Emissions of other criteria pollutants would be below the thresholds.

**Architectural Coatings.** Architectural coatings contain volatile organic compounds (VOC) that are similar to ROC and are part of the O<sub>3</sub> precursors. At this stage of project planning, no detailed architectural coatings information is available. However, compliance with the SCAQMD Rules and Regulations on the use of architectural coatings should be considered sufficient. In addition,

emissions associated with architectural coatings could be reduced by using precoated/natural-colored building materials, using water-based or low-VOC coating, and using coating transfer or spray equipment with high transfer efficiency. For example, a high-volume, low-pressure (HVLP) spray method is a coating application system operated at air pressure between 0.1 and 10 pounds per square inch gauge (psig), with 65 percent transfer efficiency. Manual applications such as paintbrush, hand roller, trowel, spatula, dauber, rag, or sponge have 100 percent transfer efficiency.

### **Long-Term Regional Air Quality Impacts**

Long-term air emission impacts are those associated with stationary sources and mobile sources related to any change related to the proposed project. The proposed sports complex and commercial use would result in both stationary and mobile sources. The stationary source emissions from the commercial uses would come from the consumption of natural gas. Based on the traffic study prepared for this project (LLG, March 2004), implementation of the proposed project would generate 3,970 daily trips on weekdays and 7,240 daily trips on Saturdays. Long-term operational emissions associated with the proposed project, calculated with the URBEMIS 2002 model and showing project impacts, are presented in Tables 4.8.G and 4.8.H. Emissions from the project related mobile sources would not exceed any criteria pollutant threshold during weekdays, however would exceed the operational thresholds for CO and NO<sub>x</sub> on Saturdays based on emission factors for year 2004. Therefore, the project related long-term air quality impacts would be significant. Trees will be planted to provide shade and shadow to buildings in order to reduce the regional impacts.

Because most of the project's air quality impacts are generated by vehicle emissions, these project design features do not substantially reduce any long-term air quality impacts of the project. Therefore, impacts remain significant and adverse.

### **Long-Term Microscale (CO Hot Spot) Analysis**

Vehicular trips associated with the proposed project would contribute to the congestion at intersections and along roadway segments in the project vicinity. Localized air quality effects would occur when emissions from vehicular traffic increase in local areas as a result of the proposed project.

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

An assessment of project-related impacts on localized ambient air quality requires that future ambient air quality levels be projected. Existing CO concentrations in the immediate project vicinity are not available. Ambient CO levels monitored at the North Long Beach station, the closest station with

**Table 4.8.G: Sports Park Operational Emissions: Weekday**

Source	Pollutants, lbs/day				
	CO	ROC	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>10</sub>
<b>Weekday emissions</b>					
Stationary sources	1.3	0.2	0.3	0	0
Sports Park	328	24	31	0.30	28
Youth Golf Center	26	2.0	2.4	0.02	2.2
General Office	68	5.1	6.2	0.06	5.7
<b>Total Weekday emissions</b>	<b>423</b>	<b>31</b>	<b>40</b>	<b>0.4</b>	<b>36</b>
<b>SCAQMD Threshold</b>	<b>550</b>	<b>55</b>	<b>55</b>	<b>150</b>	<b>150</b>
<b>Exceed SCAQMD Threshold?</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>

**Table 4.8.H: Sports Park Operational Emissions: Saturday**

Source	Pollutants, lbs/day				
	CO	ROC	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>10</sub>
<b>Saturday emissions</b>					
Stationary sources	1.3	0.2	0.3	0	0
Sports Park	716	52	67	0.66	61
Youth Golf Center	19	1.5	1.8	0.02	1.6
General Office	10	1.2	0.9	0.01	0.9
<b>Total Saturday emissions</b>	<b>746</b>	<b>55</b>	<b>70</b>	<b>0.69</b>	<b>64</b>
<b>SCAQMD Threshold</b>	<b>550</b>	<b>55</b>	<b>55</b>	<b>150</b>	<b>150</b>
<b>Exceed SCAQMD Threshold?</b>	<b>Yes<sup>1</sup></b>	<b>No</b>	<b>Yes<sup>1</sup></b>	<b>No</b>	<b>No</b>

Source: LSA Associates, Inc., October 2004.

<sup>1</sup> Saturday exceedance.

monitored CO data, showed a highest-recorded one-hour concentration of 9.7 ppm (State standard is 20 ppm) and a highest-recorded eight-hour concentration of 5.7 ppm (State standard is 9 ppm) during the past five years (see Table 4.8.D).

The highest CO concentrations would occur during peak traffic hours; hence, CO impacts calculated under peak traffic conditions represent a worst-case analysis. Based on the traffic study (LLG, March 2004), CO hot spot analyses were conducted for existing and future cumulative conditions. The impact on local carbon monoxide levels was assessed with the ARB approved CALINE4 air quality model, which allows microscale CO concentrations to be estimated along roadway corridors or near intersections. This model is designed to identify localized concentrations of carbon monoxide, often termed "hot spots." A brief discussion of input to the CALINE4 model follows. The analysis was performed for the worst-case wind angle and wind speed condition and is based upon the following assumptions:

- Selected modeling locations represent the intersections closest to the project site, with the highest project-related vehicle turning movements and the worst level of service deterioration.
- Twenty receptor locations with the possibility of extended outdoor exposure from 8 (approximately 26 feet) to 21 meters (approximately 69 feet) of the roadway centerline near intersections were modeled to determine carbon monoxide concentrations.
- The calculations assume a meteorological condition of almost no wind (0.5 meter/second), a suburban topographical condition between the source and receptor, and a mixing height of 1,000 meters, representing a worst-case scenario for CO concentrations.
- CO concentrations are calculated for the one-hour averaging period and then compared to the one-hour standards. CO eight-hour averages are extrapolated using techniques outlined in the SCAQMD CEQA Air Quality Handbook, October 1993, and compared to the eight-hour standards; a persistence factor of 0.7 was used to predict the eight-hour concentration in an attainment area.
- Concentrations are given in ppm at each of the receptor locations.
- The "at-grade" link option with speed adjusted based on average cruise speed and number of vehicles per lane per hour was used rather than the "intersection" link selection in the CALINE4 model (the Department has suggested that the "intersection" link should not be used due to an inappropriate algorithm based on outdated vehicle distribution). Emission factors from the EMFAC2002 model for all vehicles based on the adjusted speed for the years 2004 and 2006 were used for the vehicle fleet.
- The highest levels of the second-highest one-hour and eight-hour CO concentrations monitored at the North Long Beach station in the past three years were used as background concentrations: 5.9 ppm for the one-hour CO and 4.6 ppm for the eight hour CO. The "background" concentrations are then added to the model results for future with and without the proposed project conditions.

The proposed project would contribute to increased CO concentrations at intersections in the project vicinity. As shown in Table 4.8.I, under existing conditions, all ten intersections analyzed would have one-hour and eight-hour CO concentrations below the federal and State standards. The existing CO concentrations are from current traffic in the vicinity of these intersections.

**Table 4.8.I: Existing (2004) CO Concentrations<sup>1</sup>**

Intersection	Receptor Distance to Road Centerline (Meters)	Existing One-Hour CO Concentration (ppm)	Existing Eight-Hour CO Concentration (ppm)	Exceeds State Standards	
				1-Hr	8-Hr
Atlantic Ave. & Spring St.	14	8.8	6.6	No	No
	14	8.7	6.6	No	No
	14	8.5	6.4	No	No
	14	8.4	6.4	No	No
Atlantic Ave. & Willow St.	21	8.8	6.6	No	No
	20	8.8	6.6	No	No
	17	8.8	6.6	No	No
	16	8.8	6.6	No	No
California Ave. & Spring St.	8	7.3	5.6	No	No
	8	7.2	5.5	No	No
	8	7.2	5.5	No	No
	8	7.2	5.5	No	No
California Ave. & Willow St.	17	8.0	6.1	No	No
	16	8.0	6.1	No	No
	16	8.0	6.1	No	No
	16	8.0	6.1	No	No
Orange Ave. & 32nd St.	12	7.3	5.6	No	No
	12	7.3	5.6	No	No
	12	7.2	5.5	No	No
	12	7.2	5.5	No	No
Orange Ave. & I-405 SB Ramps	14	7.9	6.0	No	No
	14	7.8	5.9	No	No
	14	7.8	5.9	No	No
	12	7.8	5.9	No	No
Orange Ave. & Spring St.	14	7.6	5.8	No	No
	14	7.6	5.8	No	No
	14	7.5	5.7	No	No
	14	7.5	5.7	No	No
Orange Ave. & 29th St.	12	6.9	5.3	No	No
	12	6.9	5.3	No	No
	8	6.9	5.3	No	No
	8	6.9	5.3	No	No
Orange Ave. & 28th St.	12	6.8	5.2	No	No
	12	6.8	5.2	No	No
	8	6.8	5.2	No	No
	8	6.8	5.2	No	No
Orange Ave. & Willow St.	17	8.4	6.4	No	No
	16	8.3	6.3	No	No
	16	8.2	6.2	No	No
	16	8.2	6.2	No	No
Walnut Ave. & Spring St.	14	7.3	5.6	No	No
	14	7.3	5.6	No	No
	14	7.2	5.5	No	No
	14	7.2	5.5	No	No
Walnut Ave. & Willow St.	17	8.3	6.3	No	No
	16	8.3	6.3	No	No
	16	8.3	6.3	No	No
	16	8.3	6.3	No	No

Source: LSA Associates, Inc., March, 2004.

<sup>1</sup> Includes ambient one-hour concentration of 5.9 ppm and ambient eight-hour concentration of 4.6 ppm. Measured at the 3648 N. Long Beach Blvd., Long Beach, CA, AQ Station (Los Angeles County).

One future year scenario was evaluated for traffic impacts from the proposed project: the project build out year (2006). It is anticipated that emissions in the future years, including CO, will decrease with technology advancements in vehicular engine technology. The increase in traffic volumes would not outweigh the reduction in emission factors.

For the future opening year (2006) scenarios, traffic volumes projected for year 2006 were used, with the year 2006 emission factors for CO. The current year (2004) background CO concentrations at the North Long Beach station were used for the future opening year (2006) conditions. Table 4.8.J shows that, under the year 2006 opening year condition, none of the twelve intersections analyzed would exceed either the one-hour or the eight-hour CO concentration federal and State standards. Even though higher traffic volumes are anticipated, the lower overall CO concentrations are generally due to lower future vehicular emissions from advanced technology and lower ambient CO levels in the future. The proposed project would contribute at most a 0.7 ppm increase to the one-hour CO concentrations and 0.5 ppm increase to the eight-hour CO concentrations at these intersections. The proposed project would not have a significant impact on local air quality for CO, and no mitigation measures would be required.

### **Diesel Particulate Emissions**

Emissions from diesel truck traffic on the I-405 just north of the project is the most significant source of toxic air contaminant to users of the Sports Park due to its proximity and large volume of traffic. Therefore, an analysis of the health effects of this diesel exhaust on Sports Park users was performed. Caltrans truck traffic data for the years from 1992 to 2002 were projected forward to develop a traffic volume for light, medium, and heavy-duty diesel trucks in the year 2015. Potential health risks from this future truck traffic to the users of the Sports Park were predicted using emission factors from the ARB's emission factor model, EMFAC2002, for 2010 and the EPA's health risk analysis program HARP.

Health risk analyses are performed intentionally conservative to protect the health of a diverse population. Diesel exhaust particulate is considered to be a carcinogenic and chronic toxic air contaminant only, having long-term but not acute health effects. This means that the only effect recognized is long term, typically based on exposures of 70 years for residents and 40 years for workers. However, users of the Sports Park will be on site on an occasional basis and subject to episodic exposures, so an exposure duration of 30 years was determined to be a conservative estimate for the number of years park users would be exposed to diesel particulates. Traffic volumes and vehicle mix may change over this 30-year period. Using projected 2015 traffic volume accounts for the expected traffic volume increase and represents a reasonable conservative estimate of average traffic levels during the exposure duration. Using 2010 emission factors instead of the anticipated future lower 2015 factors accounts for higher emission rates shortly after the project opening.

The results of the HARP analysis are stated in terms of the estimated probability of an individual user of the Sports Park contracting cancer as a result of exposure to diesel exhaust particulate from trucks traveling on the I-405 over a period of 30 years. The chronic portion of the analysis is stated in terms of a hazard index, which is the ration of the 30-year exposure to diesel exhaust particulate for a user of the Sports Park to the chronic reference exposure level for diesel exhaust particulate.

**Table 4.8.J: Year 2006 CO Concentrations<sup>1</sup>**

Intersection	Receptor Distance to Road Centerline (Meters)	Project Related Increase 1-hr/8-hr (ppm)	Without/With Project One-Hour CO Concentration (ppm)	Without/With Project Eight-Hour CO Concentration (ppm)	Exceeds State Standards	
					1-Hr	8-Hr
Atlantic Ave. & Spring St.	17 / 17	0.0 / 0.0	9.3 / 9.3	7.0 / 7.0	No	No
	15 / 15	0.1 / 0.0	9.0 / 9.1	6.8 / 6.8	No	No
	14 / 14	0.0 / 0.0	8.9 / 8.9	6.7 / 6.7	No	No
	14 / 14	0.0 / 0.0	8.8 / 8.8	6.6 / 6.6	No	No
Atlantic Ave. & Willow St.	21 / 21	0.0 / 0.0	9.2 / 9.2	6.9 / 6.9	No	No
	20 / 20	0.1 / 0.1	9.1 / 9.2	6.8 / 6.9	No	No
	17 / 17	0.1 / 0.1	9.1 / 9.2	6.8 / 6.9	No	No
	16 / 16	0.0 / 0.0	9.1 / 9.1	6.8 / 6.8	No	No
California Ave. & Spring St.	14 / 14	0.1 / 0.1	7.3 / 7.4	5.6 / 5.7	No	No
	14 / 14	0.1 / 0.1	7.2 / 7.3	5.5 / 5.6	No	No
	14 / 14	0.1 / 0.1	7.2 / 7.3	5.5 / 5.6	No	No
	14 / 14	0.1 / 0.1	7.2 / 7.3	5.5 / 5.6	No	No
California Ave. & Willow St.	17 / 17	0.0 / 0.0	8.2 / 8.2	6.2 / 6.2	No	No
	16 / 16	0.0 / 0.0	8.1 / 8.1	6.1 / 6.1	No	No
	16 / 16	0.0 / 0.0	8.1 / 8.1	6.1 / 6.1	No	No
	16 / 16	0.0 / 0.0	8.1 / 8.1	6.1 / 6.1	No	No
Orange Ave. & 32nd St.	12 / 12	0.0 / 0.0	7.7 / 7.7	5.9 / 5.9	No	No
	12 / 12	0.0 / 0.0	7.6 / 7.6	5.8 / 5.8	No	No
	12 / 12	0.1 / 0.0	7.4 / 7.5	5.7 / 5.7	No	No
	12 / 12	0.1 / 0.0	7.4 / 7.5	5.7 / 5.7	No	No
Orange Ave. & I-405 SB Ramps	14 / 14	0.2 / 0.2	7.8 / 8.0	5.9 / 6.1	No	No
	14 / 14	0.2 / 0.1	7.7 / 7.9	5.9 / 6.0	No	No
	14 / 12	0.1 / 0.0	7.7 / 7.8	5.9 / 5.9	No	No
	12 / 12	0.1 / 0.0	7.7 / 7.8	5.9 / 5.9	No	No
Orange Ave. & Spring St.	14 / 14	0.5 / 0.4	8.1 / 8.6	6.1 / 6.5	No	No
	14 / 14	0.6 / 0.4	8.0 / 8.6	6.1 / 6.5	No	No
	14 / 14	0.6 / 0.4	8.0 / 8.6	6.1 / 6.5	No	No
	14 / 14	0.5 / 0.3	8.0 / 8.5	6.1 / 6.4	No	No
Orange Ave. & 29th St.	12 / 12	0.2 / 0.1	6.9 / 7.1	5.3 / 5.4	No	No
	12 / 12	0.2 / 0.1	6.9 / 7.1	5.3 / 5.4	No	No
	8 / 12	0.3 / 0.2	6.8 / 7.1	5.2 / 5.4	No	No
	8 / 12	0.3 / 0.2	6.8 / 7.1	5.2 / 5.4	No	No
Orange Ave. & 28th St.	12 / 12	0.7 / 0.5	6.8 / 7.5	5.2 / 5.7	No	No
	12 / 12	0.7 / 0.5	6.8 / 7.5	5.2 / 5.7	No	No
	8 / 12	0.7 / 0.5	6.8 / 7.5	5.2 / 5.7	No	No
	8 / 8	0.6 / 0.5	6.8 / 7.4	5.2 / 5.7	No	No
Orange Ave. & Willow St.	17 / 17	0.0 / 0.0	8.6 / 8.6	6.5 / 6.5	No	No
	16 / 17	0.0 / 0.0	8.5 / 8.5	6.4 / 6.4	No	No
	16 / 16	0.0 / 0.0	8.4 / 8.4	6.4 / 6.4	No	No
	16 / 16	0.0 / 0.0	8.4 / 8.4	6.4 / 6.4	No	No
Walnut Ave. & Spring St.	14 / 14	0.1 / 0.1	7.3 / 7.4	5.6 / 5.7	No	No
	14 / 14	0.1 / 0.1	7.3 / 7.4	5.6 / 5.7	No	No
	14 / 14	0.1 / 0.1	7.2 / 7.3	5.5 / 5.6	No	No
	14 / 14	0.1 / 0.1	7.2 / 7.3	5.5 / 5.6	No	No
Walnut Ave. & Willow St.	17 / 17	0.0 / 0.0	8.3 / 8.3	6.3 / 6.3	No	No
	16 / 16	0.1 / 0.1	8.2 / 8.3	6.2 / 6.3	No	No
	16 / 16	0.0 / 0.0	8.2 / 8.2	6.2 / 6.2	No	No
	16 / 16	0.0 / 0.0	8.2 / 8.2	6.2 / 6.2	No	No

Source: LSA Associates, Inc., March, 2004.

<sup>1</sup> Includes ambient one-hour concentration of 5.9 ppm and ambient eight-hour concentration of 4.6 ppm. Measured at the 3648 N. Long Beach Blvd., Long Beach, CA, AQ Station (Los Angeles County).

The results show that the maximum carcinogenic health risk for a user of the Sports Park would be exposed to is 8 in one million. The SCAQMD threshold is 10 in one million. The chronic health hazard index is 0.014, compared to the SCAQMD threshold of 1.0.

The traffic volume on the segment of the I-405 near the project site has been steadily increasing over the past 10 years. The total average daily truck traffic was approximately 13,000 in 1992 and approximately 15,000 in 2003 and is projected to be 17,000 in 2015. Predicted emissions from diesel trucks will decrease slightly in the future as emission controls become more restrictive and older trucks are taken off the road; however, the large scale in traffic volume will offset the decrease in emissions per truck. The net effect is that the existing health risk is less than it will be in the future.

### **Air Quality Management Plan Consistency**

In order to accurately assess the environmental impacts as a result of new or renovated developments, environmental pollution and population growth are projected for future scenarios.

The proposed project is primarily a commercial recreational development. Population growth associated with the proposed project would be within the City's General Plan projection. Therefore, the project is consistent with the adopted AQMP.

### **Mitigation Measures**

**4.8.1** The City of Long Beach shall ensure that the project complies with regional rules that assist in reducing short-term air pollutant emissions. SCAQMD 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. In addition, SCAQMD 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. The construction contractor shall be responsible for compliance with applicable regional rules.

Following are the applicable Rule 403 measures:

- 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 will be thoroughly watered prior to earthmoving.)
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard in accordance with the requirements of California Vehicle Code (CVC) Section 23114 (freeboard means vertical space between the top of the load and top of the trailer).
- Pave construction access roads at least 100 feet onto the site from main road.
- Traffic speeds on all unpaved roads shall be reduced to 15 mph or less.

- 4.8.2** The City of Long Beach shall require use of dust suppression measures in the SCAQMD CEQA Air Quality Handbook. The construction contractor shall be responsible for implementation of dust suppression measures.
- Revegetate disturbed areas as quickly as possible.
  - All excavating and grading operations shall be suspended when wind speeds (as instantaneous gusts) exceed 25 mph.
  - All streets shall be swept once per day if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water).
  - Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash trucks and any equipment leaving the site each trip.
  - All on-site roads shall be paved as soon as feasible, watered periodically, or chemically stabilized.
  - The area disturbed by clearing, grading, earthmoving, or excavation operations shall be minimized at all times.
- 4.8.3** The construction contractor shall select the construction equipment used on site based on low-emission factors and high energy efficiency. Prior to issuance of grading permits, the City of Long Beach Director of Planning and Building shall verify that construction grading plans include a statement that all construction equipment will be tuned and maintained in accordance with the manufacturer's specifications.
- 4.8.4** The construction contractor shall utilize electric or diesel-powered equipment in lieu of gasoline-powered engines where feasible.
- 4.8.5** Prior to issuance of grading permits, the City of Long Beach Director of Planning and Building shall verify that construction grading plans include a statement that work crews will shut off equipment when not in use. During smog season (May through October), the overall length of the construction period will be extended, thereby decreasing the size of the area prepared each day, to minimize vehicles and equipment operating at the same time.
- 4.8.6** 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 flagperson shall be retained to maintain safety adjacent to existing roadways.
- 4.8.7** The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew.
- 4.8.8** The City of Long Beach shall ensure that the project complies with the SCAQMD rules and regulations on the use of architectural coatings, which include use of pre-coated/natural-colored building materials, using water-based or low-VOC coating, and using coating transfer or spray equipment with high transfer efficiency. The construction contractor shall be responsible for compliance with applicable SCAQMD Rules and Regulations on the use of architectural coatings.

**4.8.9** The project is expected to create total (vehicular and stationary) daily emissions exceeding the daily emissions thresholds established by the SCAQMD.

The City of Long Beach shall ensure that the project complies with Title 24 of the California Code of Regulations established by the Energy Commission regarding energy conservation standards. During Plan Check, the City of Long Beach Building Official shall verify that the following measures are incorporated into project building plans:

- Solar or low-emission water heaters shall be used with combined space/water heater units.
- Double-paned glass or window treatment for energy conservation shall be used in all exterior windows.

#### **4.8.6 CUMULATIVE IMPACTS**

The project site is planned for development (industrial) in the adopted City of Long Beach General Plan and is zoned for industrial and institutional uses. Emissions projections used to establish SCAQMD attainment objectives reflect adopted regional and local land use plans. The proposed project uses are generally less intense than the current site designation. Therefore, the emissions associated with occupation and use of the project are expected to be less than those already accounted for in the South Coast Air Quality Management Plan and are not expected to violate any SCAQMD standards or contribute to air quality deterioration beyond current SCAQMD projections.

The study included in the “Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant,” June 1998, estimated that the population-weighted average outdoor diesel exhaust PM<sub>10</sub> concentration in California for 1995 was 2.2 micrograms per cubic meter (µg/m<sup>3</sup>) with it reaching as high as 10 µg/m<sup>3</sup> near a freeway. These concentrations of diesel particulates present a carcinogenic health risk ranging from 130 in a million to 2,400 in a million (using a 70-year exposure duration). The study suggests that virtually all residents of California are being exposed to large doses of diesel exhaust PM<sub>10</sub>. The concentration of diesel particulates at the project site is below the established risk threshold. Individuals living and working in Southern California may be exposed to levels of diesel emissions that are cumulatively significant; however, that circumstance is not created by the project. The proposed project will generate few truck trips and does not result in a cumulatively significant contribution to the diesel emissions in the region.

#### **4.8.7 LEVEL OF SIGNIFICANCE AFTER MITIGATION**

Project-related traffic would not significantly affect local CO levels, which would remain below the State and federal CO standards. Therefore, the project effects on local CO levels are less than significant.

Even with compliance with SCAQMD rules and regulations, short-term construction emissions are expected to exceed the SCAQMD criteria pollutant thresholds for NO<sub>x</sub> and PM<sub>10</sub>. While the implementation of mitigation will further reduce these emissions, they remain above the threshold levels and are significant even after mitigation.

Long-term operational emissions associated with the proposed project, calculated with the URBEMIS 2002 model, are projected to exceed the SCAQMD criteria pollutant thresholds for CO and NO<sub>x</sub> on Saturdays only. Mitigation does not reduce these impacts to below a level of significance, and the impacts remain significant after mitigation.

The health risk to users of the Sports Park from diesel particulate emissions from the nearby I-405 was determined to be below the established threshold of 10 in one million. Therefore, the health effects of diesel particulate on users of the Sports Park site are less than significant.

The project site is planned for industrial development in the adopted City of Long Beach General Plan. The proposed Sports Park is of comparable or less intensity than the current site designation. Therefore, the emissions associated with occupation and use of the project are not expected to violate any SCAQMD standards or contribute to air quality deterioration beyond current SCAQMD projections.

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