## 4.2 AIR QUALITY

This section provides an evaluation of potential air quality impacts associated with the proposed project. The evaluation is based on an *Air Quality and Climate Change Technical Report* prepared by HELIX Environmental Planning (HELIX) for the project, included as Appendix B to this EIR (HELIX 2012a).

### 4.2.1 Environmental Setting

**Meteorology/Climate**

The climate of the SP area, and all of San Diego, is dominated by a semi-permanent high pressure cell over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. The high pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

Subsidence inversions occur during the warmer months as descending air associated with the Pacific high pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses can also trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce ozone, commonly known as smog.

**Criteria Pollutants**

Background

Air quality is defined by ambient air concentrations of specific pollutants identified by the U.S. Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several pollutants (called "criteria" pollutants). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property

and the public welfare from air pollutants in the atmosphere. Areas that do not meet the NAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant.

The USEPA established NAAQS for the protection of human health and the public welfare for seven criteria pollutants: carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), ozone ($O_3$), particulate matter with an aerodynamic diameter less than 10 microns ($PM_{10}$), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb). Ozone is not emitted directly, but is formed from a complex set of reactions involving $O_3$ precursors such as nitrogen oxides ($NO_x$) and volatile organic compounds (VOC) or reactive organic compounds (ROC). Regulations relating to $O_3$, therefore, address emissions of $NO_x$, VOC, and ROC.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board (CARB) has established the more stringent California Ambient Air Quality Standards (CAAQS) for the seven criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant.

The following specific descriptions of health effects for each of the criteria air pollutants associated with project construction and operations are based on USEPA and CARB definitions.

*Ozone*

$O_3$ is considered a photochemical oxidant, which is a chemical that is formed when volatile organic compounds (VOCs) and $NO_x$, both by-products of combustion, react in the presence of ultraviolet light. $O_3$ is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at greatest risk from exposure to $O_3$.

*Carbon Monoxide*

CO is a product of combustion, and the main source of CO in the SDAB is from motor vehicle exhaust. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body's organs and

tissues. CO can cause health effects to those with cardiovascular disease, and can also affect mental alertness and vision.

*Nitrogen Dioxide*

$NO_2$ is also a by-product of fuel combustion, and is formed both directly as a product of combustion and in the atmosphere through the reaction of nitrogen oxide (NO) with oxygen. $NO_2$ is a respiratory irritant and may affect those with existing respiratory illness, including asthma. $NO_2$ can also increase the risk of respiratory illness.

*Respirable Particulate Matter and Fine Particulate Matter*

Respirable particulate matter, or $PM_{10}$, refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter, or $PM_{2.5}$, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in this size range has been determined to have the potential to lodge in the lungs and contribute to respiratory problems. $PM_{10}$ and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, combustion, tire and brake wear, construction operations and windblown dust. $PM_{10}$ and $PM_{2.5}$ can increase susceptibility to respiratory infections and aggravate existing respiratory diseases such as asthma and chronic bronchitis. $PM_{2.5}$ is considered to have the potential to lodge deeper in the lungs than $PM_{10}$.

In particular, diesel exhaust particulate matter is known to the state of California as a carcinogenic compound. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Air Pollution Control Officers' Association (CAPCOA) Air Toxics "Hot Spots" Program Risk Assessment Guidelines as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions have the potential to result in adverse health impacts.

*Sulfur Dioxide*

$SO_2$ is a colorless, reactive gas that is produced from the burning of sulfur-containing fuels such as coal and oil, and by other industrial processes. Generally, the highest concentrations of $SO_2$ are found near large industrial sources. $SO_2$ is a respiratory irritant that can cause narrowing of the airways, leading to wheezing and shortness of breath. Long-term exposure to $SO_2$ can cause respiratory illness and aggravate existing cardiovascular disease.

*Lead*

Lead in the atmosphere occurs as particulate matter. Lead has historically been emitted from vehicles combusting leaded gasoline, as well as from industrial sources. With the phase-out of leaded gasoline, large manufacturing facilities are now the sources of the largest amounts of lead emissions. Lead has the potential to cause gastrointestinal, central nervous system, kidney and blood diseases upon prolonged exposure. Lead is also classified as a probable human carcinogen.

*Sulfates*

Sulfates are the fully oxidized ionic form of sulfur. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to $SO_2$ during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of $SO_2$ to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. The CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility and, due to fact that they are usually acidic, can harm ecosystems and damage materials and property.

*Hydrogen Sulfide*

Hydrogen sulfide ($H_2S$) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing $H_2S$ at levels above the standard would result in exposure to a very disagreeable odor. In 1984, a CARB committee concluded that the ambient standard for $H_2S$ is adequate to protect public health and to significantly reduce odor annoyance.

*Vinyl Chloride*

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

causes central nervous system effects, such as dizziness, drowsiness and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure can cause liver damage, and cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer, in humans.

*Visibility-Reducing Particles*

Visibility-reducing particles consist of suspended PM, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt. These particles in the atmosphere can obstruct the range of visibility. Their concentration regulation standard is intended to limit the frequency and severity of visibility impairment due to regional haze.

Regulatory Framework

The CARB is the state regulatory agency with authority to enforce regulations to achieve and maintain the NAAQS and CAAQS. The CARB is responsible for the development, adoption and enforcement of the state's motor vehicle emissions program, as well as the adoption of the CAAQS. The CARB also reviews operations and programs of the local air districts, and requires each air district that is considered a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations that reflect the strategy to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans and adoption and enforcement of air pollution regulations. In San Diego County, the attainment planning process is embodied in a regional air quality management plan developed jointly by the San Diego Air Pollution Control District (APCD) and the San Diego Association of Governments (SANDAG). In San Diego, the APCD is responsible for attainment planning required by the California Clean Air Act. The APCD develops the Regional Air Quality Strategy (RAQS) to address strategies within the SDAB to attain and maintain air quality standards. The RAQS was initially adopted by the SDAPCD in 1992 and amended in 1993, in response to CARB comments. SDAPCD further updated the RAQS Revisions in 1995, 1998, 2001, 2004, and 2009. The local RAQS, in combination with those from all other California nonattainment areas with serious (or worse) air quality problems, is submitted to the CARB, which develops the California State Implementation Plan (SIP). The SIP was adopted by the CARB in 2007, and forwarded to the USEPA for their approval later that year.

Table 4.2-1, *Ambient Air Quality Standard*s, presents a summary of the state and federal ambient air quality standards.

**Table 4.2-1**
**NATIONAL AND CALIFORNIA 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 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 ($NO_2$)** (see footnote 8) | Annual Arithmetic Mean | 0.030 ppm (57 µg/m$^3$) | Gas Phase Chemiluminescence | 53 ppb (100 µg/m$^3$) | Same as Primary Standard | Gas Phase Chemilumi-nescence |
| | 1-Hour | 0.18 ppm (339 µg/m$^3$) | | 100 ppb (188 µg/m$^3$) | None | |
| **Sulfur Dioxide ($SO_2$)** | Annual Arithmetic Mean | - | Ultraviolet Fluorescence | 0.030 ppm (see footnote 9) | - | Ultraviolet Fluorescence Spectro-photometry (Pararo-saniline Method) |
| | 24-Hour | 0.04 ppm (105 µg/m$^3$) | | 0.14 ppm (see footnote 9) | - | |
| | 3-Hour | - | | - | 0.5 ppm (1300 µg/m$^3$) | |
| | 1-Hour | 0.25 ppm (655 µg/m$^3$) | | 75 ppb (196 µg/m$^3$) (see footnote 9) | - | |
| **Lead[10,11]** | 30-Day Average | 1.5 µg/m$^3$ | Atomic Absorption | - | - | - |
| | Calendar Quarter | - | | 1.5 µg/m$^3$ | Same as Primary Standard | High Volume Sampler and Atomic Absorption |
| | Rolling 3-Month Average | - | | 0.15 µg/m$^3$ | | |
| **Visibility Reducing Particles[12]** | 8-Hour | Extinction coefficient of 0.23 kilometers – visibility of ten miles or more (0.7 – 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 | | |

**Table 4.2-1 (cont.)**
**NATIONAL AND CALIFORNIA 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] |
| **Sulfates** | 24 Hour | 25 µg/m$^3$ | Ion Chromatography | | | |
| **Hydrogen Sulfide ($H_2S$)** | 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 | | | |

[1] California standards for $O_3$, CO (except Lake Tahoe), $SO_2$ (1- and 24-hour), $NO_2$, suspended particulate matter—$PM_{10}$, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than $O_3$, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The $O_3$standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For $PM_{10}$, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m$^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact 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 degrees Celsius (°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 parts per million (ppm) by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure which can be shown to the satisfaction of the CARB 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 the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 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, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[10] The CARB has identified Pb and VC as TACs 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] The national standard for Pb was revised on October 15, 2008 to a rolling 3-month average. The 1978 Pb standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[12] In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.
ppm = parts per million; µg/m$^3$ = micrograms per cubic meter; mg/m$^3$ = milligrams per cubic meter
Source: CARB February 7, 2012, HELIX 2012a

## Existing Criteria Pollutant Levels

The APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring stations to the SP area are the Camp Pendleton station, which is located approximately four miles north of the SP area ($O_3$ and $NO_2$ only), and the Escondido station, which is located approximately seven miles to the east of the SP area (CO, $PM_{10}$ and $PM_{2.5}$). Because of its coastal location similar to the SP area, the Camp Pendleton monitoring station ozone levels are considered most representative of the SP area. Conversely, the Escondido monitoring station concentrations for all other pollutants (except $SO_2$) are considered most

representative of the SP area. The downtown San Diego monitoring station is the nearest location to the SP area where $SO_2$ concentrations are monitored. Ambient concentrations of pollutants from these stations over the last three years are presented in Table 4.2-2, *Ambient Background Concentrations for San Diego Monitoring Stations*.

The 8-hour federal $O_3$ standard was not exceeded in 2007 and 2011; however, it was exceeded two times in 2008, and one time each in 2009 and 2010. The 24-hour daily federal $PM_{2.5}$ standard was exceeded 13 times each in 2007, 2008, and 2009; 12 times in 2010; and 10 times in 2011. The other criteria pollutant data from the monitoring stations indicate that air quality is in attainment of all other federal standards. The Escondido monitoring station measured at least one exceedance of the annual federal $PM_{10}$ standard during the period from 2006 to 2008; however, one exceedance per year is exempted under NAAQS. The Escondido monitoring station measured two exceedances of the daily California $PM_{10}$ standard in 2007, during the period of the October 2007 wildfire season. The 8-hour California $O_3$ standard was exceeded 2 times in 2008, 1 time in 2009, and 1 time in 2010. Because of the location of the monitoring station in downtown Escondido, where traffic congestion is prevalent, the station has higher concentrations of CO than are measured elsewhere in San Diego County and the background data are not likely to be representative of background ambient CO concentrations in the project vicinity. Use of downtown Escondido background data therefore provides a conservative estimate of background CO concentrations.

**Table 4.2-2**
**AMBIENT BACKGROUND CONCENTRATIONS**
**SAN DIEGO MONITORING STATIONS**

| Air Pollutant | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| **Ozone – Camp Pendleton** | | | | | |
| Max 1 Hour (ppm) | 0.083 | 0.104 | 0.090 | 0.092 | 0.085 |
| Days > CAAQS (0.09 ppm) | 0 | 1 | 0 | 1 | 0 |
| Max 8 Hour (ppm) | 0.074 | 0.077 | 0.077 | 0.079 | 0.071 |
| Days > NAAQS (0.075 ppm) | 0 | 2 | 1 | 1 | 0 |
| Days > CAAQS (0.070 ppm) | 4 | 3 | 5 | 1 | 2 |
| **Nitrogen Dioxide ($NO_2$) – Camp Pendleton** | | | | | |
| Max 1 Hour (ppm) | 0.072 | 0.081 | 0.068 | 0.081 | 0.066 |
| Days > CAAQS (0.18 ppm) | 0 | 0 | 0 | 0 | 0 |
| Annual Max (ppm) | 0.016 | 0.018 | 0.010 | 0.008 | 0.007 |
| Days > NAAQS (0.053 ppm) | 0 | 0 | 0 | 0 | 0 |
| Days > CAAQS (0.030 ppm) | 0 | 0 | 0 | 0 | 0 |

**Table 4.2-2 (cont.)**
**AMBIENT BACKGROUND CONCENTRATIONS**
**SAN DIEGO MONITORING STATIONS**

| Air Pollutant | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| **Carbon Monoxide (CO) – Escondido** | | | | | |
| Max 8 Hour (ppm) | 3.2 | 2.8 | 3.05 | 2.78 | 2.56 |
| Days > NAAQS (9 ppm) | 0 | 0 | 0 | 0 | 0 |
| Days > CAAQS (9.0 ppm) | 0 | 0 | 0 | 0 | 0 |
| Max 1 Hour (ppm) | 5.2 | 5.6 | 4.4 | 3.9 | 3.5 |
| Days > NAAQS (35 ppm) | 0 | 0 | 0 | 0 | 0 |
| Days > CAAQS (20 ppm) | 0 | 0 | 0 | 0 | 0 |
| **Particulate Matter ($PM_{10}$) – Escondido** | | | | | |
| Max Daily (µg/m$^3$) | 68.0 | 82.0 | 74.0 | 43.0 | 40.0 |
| Days > NAAQS (150 µg/m$^3$) | 0 | 0 | 0 | 0 | 0 |
| Days > CAAQS (50 µg/m$^3$) | 2 | 1 | 1 | 0 | 0 |
| Annual Max (µg/m$^3$) | 27 | 27 | 27 | 25 | 25 |
| Days > NAAQS (20 µg/m$^3$) | 1 | 1 | 1 | 1 | 1 |
| **Particulate Matter ($PM_{2.5}$) – Escondido** | | | | | |
| Max Daily (µg/m$^3$) | 126.2 | 44.0 | 64.9 | 48.4 | 67.7 |
| Days > NAAQS (35 µg/m$^3$) | 11 | 0 | 2 | 2 | 3 |
| Annual Max (µg/m$^3$) | 13 | 13 | 13 | 12 | 10 |
| Days > NAAQS (15 µg/m$^3$) | 0 | 0 | 0 | 0 | 0 |
| Days > CAAQS (12 µg/m$^3$) | 1 | 1 | 1 | 0 | 0 |
| **Sulfur Dioxide ($SO_2$) – Downtown San Diego** | | | | | |
| Max Daily Measurement (ppm) | 0.006 | 0.007 | 0.006 | 0.002 | 0.003 |
| Days > NAAQS (0.14 ppm) | 0 | 0 | 0 | 0 | 0 |
| Days > NAAQS (0.04 ppm) | 0 | 0 | 0 | 0 | 0 |

Abbreviations: > = exceed; ppm = parts per million; □g/m$^3$ = micrograms per cubic meter
CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard Mean = Annual Arithmetic Mean
* No Data / Insufficient Data
Source: CARB 2010 (all pollutants except 1-hour CO and annual maximum for $PM_{10}$, $PM_{2.5}$, and $NO_2$)
EPA 2010c (1-hour CO, and daily maximums for $PM_{10}$, $PM_{2.5}$, and $NO_2$)

As of April 30, 2012, the SDAB has been reclassified as a marginal nonattainment area for the 8-hour NAAQS for $O_3$. The attainment schedule in the SIP called for the SDAB to attain the NAAQS for $O_3$ by June 15, 2009. However, because the marginal $O_3$ nonattainment reclassification will become effective on July 20, 2012, SDAPCD will have to prepare another revision to the Ozone Attainment Plan soon. The SDAB is an attainment area for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for $O_3$, $PM_{10}$, and $PM_{2.5}$.

**Toxic Air Contaminants**

Background

In addition to the criteria air pollutants for which there are NAAQS and CAAQS, EPA and CARB also regulates a list of air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics identified by the EPA. MSATs are emitted from vehicle and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as by-products. Metal air toxics result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants (HAPs) from Mobile Sources 66 FR 17229 (March 29, 2001). In the 2001 rulemaking, six of the 21 MSATs were identified by EPA as priority MSATs: acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1,3-butadiene (66 FR 17230).

In its rule, EPA also examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, the Federal Highway Administration (FHWA) projects that even with a 64-percent increase in Vehicle Miles Traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 to 65 percent, and will reduce on-highway diesel particulate matter (DPM emissions by 87 percent.

In 1998, California identified DPM as a TAC based on its potential to cause cancer and other adverse health impacts. In addition to diesel PM, emissions from diesel-fueled engines include over 40 other cancer-causing substances. In September 2000, the CARB approved a comprehensive Diesel Risk Reduction Plan (DRRP) to reduce diesel emissions from both new and existing diesel-fueled engines and vehicles. The goal of the DRRP is to reduce

DPM emissions and the associated health risk by 75 percent in 2010 and 85 percent or more by 2020 (from the base year 2000 level).

California Diesel Regulations

The CARB is responsible for developing statewide programs and strategies to reduce the emission of smog-forming pollutants and toxics by diesel-fueled mobile sources. The identification of DPM as a TAC in 1998 led the CARB to adopt the DRRP in 2000. Included here are some of the resultant regulations that may be pertinent to this project.

California Diesel Fuel Regulations

This rule sets sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles. Under this rule, diesel fuel used in motor vehicles had been limited to 500 ppm sulfur since 1993. The sulfur limit was reduced to 15 ppm beginning in September 1, 2006. (A federal diesel rule similarly limits sulfur content nationwide for on-road vehicles to 15 ppm, which began on October 15, 2006.)

California In-Use Off-Road Diesel Vehicle Regulation

On July 26, 2007, the CARB adopted a regulation to reduce DPM and NOX emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Any person, business, or government agency that owns or operates diesel-powered off-road vehicles in California (except for agricultural or personal use, or for use at ports or intermodal rail yards) with engines with maximum power of 25 horsepower or greater are subject to the regulation. The regulation applies to vehicles commonly used in construction, mining, rental, airport ground support, and other industries. Out-of-state companies doing business in California are also subject to the regulation.

California On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation

In 2008, the CARB approved a regulation to reduce emissions from existing trucks and buses operating in California significantly. Affected vehicles include on-road, heavy-duty, diesel-fueled vehicles with a gross vehicle weight rating (GVWR) greater than 14,000 pounds; yard trucks with off-road certified engines; and diesel-fueled shuttle vehicles of any GVWR. Out-of-state trucks and buses that operate in California are also subject to the regulation. Approximately 170,000 businesses in nearly all industry sectors in California, and almost a

million vehicles that operate on California roads each year, are affected. Some common industry sectors that operate vehicles subject to the regulation include for-hire transportation; construction, manufacturing, retail, and wholesale trade; vehicle leasing and rental; bus lines; and agriculture.

**Existing Toxic Air Contaminant Levels**

Diesel Particulate Matter

Ambient levels of selected TACs are measured by the CARB at several locations in southern California. The closest TAC monitoring stations to Carlsbad are in El Cajon and Chula Vista, approximately 30 and 45 miles south of the SP area, respectively. Both of these stations may potentially contain higher, as well as different, TAC concentrations than those near the proposed project because of the distance from the SP area and the myriad land uses in those areas. Because diesel PM measurements are not collected at the two monitoring stations, background concentrations for this TAC were obtained from the 2009 California Almanac of Emissions and Air Quality (CARB 2009a). The annual average concentration for diesel PM in the SDAB is 1.4 micrograms per cubic meters ($\mu g/m^3$) with an estimated cancer risk of 420 chances in 1 million. For perspective, one out of three Americans will eventually develop cancer, and one out of four will die from cancer. Therefore, the national average background cancer incidence is equivalent to 333,000 chances in one million.

Structural and Naturally Occurring Asbestos

There is potential for structural asbestos to occur on site, mostly due to the nature of the old building materials. No NOA is anticipated to be encountered at the project site.

### 4.2.2 Thresholds for Determining Significance

Appendix G of the State CEQA Guidelines is used to provide direction for determination of a significant air quality impact from the proposed project. For the purposes of this EIR, a significant impact would occur if the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

- Result in cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors (i.e., day care centers, schools, retirement homes and hospitals or medical patients in residential homes which could be impacted by air pollutants) to substantial pollutant concentrations, including air toxins such as diesel particulates; or
- Create objectionable odors affecting a substantial number of people.

The City of Carlsbad's emission-specific thresholds were derived from the APCD's Regulation II, Rule 20.2, Table 20.2, Air Quality Impact Analysis (AQIA) Trigger Levels. These thresholds are applicable as screening criteria for potential significance. The threshold for reactive organic gases (ROG) is based on significance criteria from the City of San Diego. The threshold for $PM_{2.5}$ is based on significance criteria from the South Coast Air Quality Management District. The emission thresholds are shown in Table 4.2-3, *Air Quality Significance Thresholds*.

**Table 4.2-3**
**AIR QUALITY SIGNIFICANCE THRESHOLDS**

| Pollutant | Pounds/day | Tons/year |
|---|---|---|
| Carbon Monoxide (CO) | 550 | 100 |
| Oxides of Nitrogen ($NO_x$) | 250 | 40 |
| Particulate Matter ($PM_{10}$) | 100 | 15 |
| Oxides of Sulfur ($SO_x$) | 250 | 40 |
| Lead and Lead Compounds | 3.2 | 0.6 |
| Reactive Organic Gases (ROG) | 137 | 15 |
| Fine Particulate Matter ($PM_{2.5}$) | 55 | 10 |

Sources: HELIX 2012a

In the event that emissions exceed these thresholds, modeling is required to determine whether the project's total air quality impacts would result in ground-level concentrations that are above the state and federal ambient air quality standards (shown in Table 4.2-1), including appropriate background levels (shown in Table 4.2-2).

For TACs in San Diego County, SDAPCD Regulation XII establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional TACs. Under Rule 1210, emissions of TACs that result in a cancer risk of more than ten in one million, or a health Hazard Index of more than one, are considered a significant impact.

With regard to evaluating whether a project would have a significant impact on sensitive receptors, air quality regulators typically define sensitive receptors as schools (preschool through 12th grade), hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. Any project which has the potential to directly impact a sensitive receptor located within one mile and results in a health risk greater than ten in one million would have a potentially significant impact.

In regard to odor, APCD Rule 51 (Public Nuisance) prohibits emission of any material which causes nuisance to a considerable number of persons or endangers the comfort, health or safety of any person. A project that proposes a use which would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

### 4.2.3 Environmental Impact

**Air Quality Management Plan**

Section 15125(B) of the State CEQA Guidelines contains specific reference to the need to evaluate any inconsistencies between the proposed project and the applicable air quality management plan. The RAQS plan sets forth the steps needed to accomplish attainment of safe and federal ambient air quality standards. Included in the RAQS are mobile source controls such as Transportation Control Measures, as well as stationary source controls and other related emission-reduction measures.

The SP area is located in the SDAB, in an area where a regional air quality plan is being implemented. The SP area is designated R, Regional Commercial, in the City of Carlsbad General Plan. The land use designations immediately surrounding the SP area are Open Space (OS), Medium-High Density Residential (RMH), and Local Shopping Center (L). Under the City of Carlsbad's Zoning Ordinance, the SP area is zoned as C-2, General Commercial, which may include uses such as commercial and office, personal services, retail, and wholesale. The SP allows for the flexibility to meet the progressive commercial, entertainment and service needs of the residents of Carlsbad and coastal North County region. The SP would implement the General Plan's R land use designation for the SP area, in conjunction with the C-2 district established in the Zoning Ordinance.

The APCD relies to a certain degree on land use designations contained in general plan documents applicable to its jurisdiction. The APCD refers to the contents of approved general plans in order to forecast, inventory and allocate regional emissions from land use and development-related sources. These emissions budgets are used in statewide air quality attainment planning efforts. As such, the proposed project would be consistent with the regional air quality plan. Additionally, the project would involve the provision of additional employment-generating uses within the North County area that could reduce vehicle miles traveled in the region through the provision of employment-generating uses closer to residential land uses. The proposed project would be consistent with the RAQS and the impact would be less than significant.

**Construction Impacts**

Short-term construction impacts of the proposed project would generate ozone precursor emissions (i.e., ROG and $NO_x$) from heavy-duty construction equipment operating within the SP area, from mobile-source emissions attributed to construction workers and haul/delivery trucks that would travel to and from the area. In addition, ROG emissions would occur during each "finishing" phase of construction activity, during asphalt paving and during the application of architectural coatings (e.g., paints). The largest quantity of fugitive $PM_{10}$ emissions would occur during demolition activities.

Emissions from the construction phase of the project were estimated through the use of the CalEEMod model version 2001.1, a computer model developed for the CARB by estimating the types and number of pieces of equipment that would be used to demolish existing structures, grade the project site, construct the proposed development, and plant new landscaping within the project site. The CalEEMod Model contains the latest OFFROAD emission factors and EMFAC2007 emission factors from the CARB's models for off-road equipment and on-road vehicles. The model estimates the types and number of pieces of equipment that would be used for the demolition of existing structures, grading, construction and landscaping within the SP area.

The construction activities associated with the proposed project would create diesel emissions, and would generate emissions of dust. Construction equipment within the project site that would generate criteria air pollutants could include backhoe, cranes, dozers, excavator, loaders, portable rock crusher, and haul trucks. Some of this equipment would be used during demolition and grading/excavation activities as well as when buildings are constructed within the SP area. In addition, emissions during construction and grading activities include truck trips off site to

remove debris during the demolition phase and construction worker truck trips. It is assumed that most of the construction equipment used would be diesel-powered.

Table 4.2-4, *Construction Phases and Equipment Requirements*, presents a summary of the assumed equipment that would be involved in construction.

Construction would require heavy equipment during demolition, grading/excavation, building construction, architectural coating, and paving. For the purpose of this analysis, construction activities are assumed to occur in three separate phases, which would occur sequentially.

Demolition emissions were calculated as a separate phase. It is estimated that approximately 225,631 sf of the building structure would be renovated; and the project would require approximately 8,000 cy of surface cuts; 12,000 cy of fill, 8,000 cy of remedial grading, and 4,000 cy of imported soil. Building construction, architectural coating (i.e., painting), and asphalt paving emissions were calculated as well.

Based on the assumed construction schedule, the maximum daily emissions for all pollutants except ROGs occur during the grading portion of the construction. For ROGs, the maximum emissions would occur during construction of buildings application of architectural coatings and paving.

Heavy equipment emissions, fugitive dust emissions, and other construction-related volatile emissions were estimated using the CalEEMod Model, Version 2011.1. Equipment emission rates are based on California state-wide emissions for the San Diego County region.

EMFAC2007 Version 2.3 was used in CalEEMod model to develop emission factors for the various criteria pollutants from construction equipment. EMFAC2007 does not account for rules and regulations enacted by the CARB after 2007. Two notable regulations not captured in EMFAC are those designed to reduce $NO_x$ and diesel particulate matter (DPM). The 2010 Statewide Diesel Bus and Truck Regulation and Drayage Truck Regulation will require fleets to reduce DPM and $NO_x$ emissions. The regulations now require the installation of particulate matter filters beginning January 1, 2012 and replacement of older engines beginning January 1, 2015. All trucks to be utilized at the proposed Westfield Carlsbad project site would be required to meet the 2007 U.S. EPA standards for trucks.

**Table 4.2-4**
**CONSTRUCTION PHASES AND EQUIPMENT REQUIREMENTS**

| | | Demolition | | Grading | | Building Construction | | Architectural Coatings | | Paving | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Duration (month) | 1 | | 3-4 | | 12-15 | | 6-8 | | 1-2 | |
| List of Equipment | Horsepower | Pieces | Hours | Pieces | Hours | Pieces | Hours | Pieces | Hours | Pieces | Hours |
| Aerial Lift | 34 | 4 | 8 | | | 10 | 8 | 3 | 8 | | |
| Air Compressors | 78 | 2 | 8 | | | 2 | 8 | 1 | 8 | | |
| Cement and Mortar Mixers | 9 | | | 1 | 8 | 2 | 8 | 1 | 8 | 1 | 8 |
| Concrete/Industrial Saws | 81 | 1 | 8 | | | | | | | | |
| Cranes | 208 | 1 | 4 | | | 2 | 4 | | | | |
| Crawler Tractors | 82 | 1 | 8 | 5 | 8 | | | | | 4 | 8 |
| Crushing/Proc. Equipment | 85 | 1 | 4 | | | | | | | | |
| Dumpers/Tenders | 16 | 10 | 4 | 20 | 4 | | | | | 20 | 4 |
| Excavators | 157 | 2 | 8 | 3 | 8 | 1 | 4 | | | | |
| Forklifts | 149 | 2 | 8 | | | 4 | 8 | 1 | 8 | | |
| Generator Sets | 84 | 2 | 8 | | | 3 | 8 | | | | |
| Graders | 162 | | | 2 | 8 | | | | | 1 | 8 |
| Off-Highway Tractors | 160 | | | 1 | 8 | 1 | 8 | | | 1 | 4 |
| Off-Highway Trucks | 381 | | | 2 | 8 | | | | | 1 | 4 |
| Other Construction Equipment | 327 | 2 | 4 | 2 | 4 | 2 | 4 | | | 2 | 4 |
| Other General Industrial Equipment | 150 | | | 1 | 4 | 4 | 4 | | | | |
| Pavers | 89 | | | | | | | | | 2 | 8 |
| Paving Equipment | 82 | | | | | | | | | 4 | 8 |
| Plate Compactors | 8 | | | | | 2 | 8 | | | 2 | 8 |
| Pressure Washers | 13 | | | | | 2 | 8 | | | | |
| Pumps | 84 | | | | | 1 | 8 | | | | |
| Rollers | 84 | | | 2 | 8 | | | | | 3 | 8 |
| Rough Terrain Forklifts | 83 | 1 | 8 | | | 2 | 8 | 1 | 8 | | |
| Rubber Tired Dozers | 358 | 1 | 4 | 2 | 4 | | | | | 2 | 4 |
| Rubber Tired Loaders | 87 | 1 | 8 | 2 | 8 | | | | | 2 | 8 |
| Skid Steer Loaders | 37 | 4 | 8 | 2 | 8 | 1 | 8 | | | 2 | 8 |
| Sweepers/Scrubbers | 88 | 1 | 4 | | | 1 | 4 | | | 1 | 4 |
| Tractors/Loaders/Backhoes | 75 | 2 | 8 | 2 | 8 | 2 | 8 | | | 2 | 8 |
| Welders | 46 | | | | | 8 | 8 | | | | |

Source: Construction duration - Westfield 2012, List of Equipment – CalEEMod Default

[1] It was assumed that the building construction and paving phases would overlap in the last two months of construction.

For the off-road equipment (i.e., heavy construction equipment), OFFROAD2007 was used to develop emission factors for the various criteria pollutants. OFFROAD2007 utilizes the U.S. EPA Tier 1 equipment emission factors and does not account for rules and regulations enacted by the CARB after 2007. To reduce emissions from non-road diesel equipment, EPA established a series of tier emission standards for new non-road diesel engines. Tier 1 standards were phased in between 1996 and 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in between 2001 and 2006. Tier 3 standards were phased in between 2006 and 2008. Tier 4 standards, which often require add-on emission control equipment to reach attainment, are being phased in from 2008 to 2015. For the proposed project, the Tier 3 engine standards were applied to construction equipment in the CalEEMod model.

Table 4.2-5, *Daily Construction Emissions*, presents a summary of emissions for each individual construction phase, assuming standard dust control measures (e.g., watering two times daily during grading, applying soil stabilizers on inactive sites, replacing ground cover on inactive areas as soon as possible, reducing speed on unpaved roads to 15 mph or less, and watering unpaved haul roads) would be implemented to reduce fugitive dust generation.

**Table 4.2-5**
**DAILY CONSTRUCTION EMISSIONS**

| Year | ROG | $NO_x$ | CO | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| | Pounds/day[1] | | | | | |
| 2013 | 28.55 | 198.01 | 121.06 | 0.24 | 36.01 | 14.91 |
| 2014 | 58.59 | 150.12 | 114.21 | 0.20 | 11.86 | 10.29 |
| **Highest Daily Emissions** | **58.59** | **198.01** | **121.06** | **0.24** | **36.01** | **14.91** |
| Screening-Level Thresholds | 137 | 250 | 550 | 250 | 100 | 55 |
| ***Above Screening-Level Thresholds?*** | ***No*** | ***No*** | ***No*** | ***No*** | ***No*** | ***No*** |

[1]Maximum of summer and winter daily emissions
Source: HELIX 2012a

As illustrated in Table 4.2-5, emissions of all criteria pollutants related to project construction would be below the significance thresholds. Furthermore, due to the fact that the construction is short-term in nature, construction would not result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, a less than significant impact related to construction-phase criteria pollutant emissions would occur.

## Operational Impacts

Operation Area and Mobile Source Emissions

The net operational impacts associated with the proposed project would include impacts associated with vehicular traffic, as well as area sources such as energy use, landscaping, consumer products use, and architectural coatings use. The total net operational impacts associated with area sources including energy use, landscaping, consumer products use, hearth emissions, and architectural coatings use for maintenance purposes were estimated using the CalEEMod model, Version 2011.1. It should be noted that the CalEEMod model does not contain San Diego-specific emission factors; therefore, emissions are based on California statewide averages. Also, the emissions estimates associated with proposed revitalization project are limited to the net increase of approximately 35,417 sf of the regional shopping center.

According to the Transportation Study prepared for the project (Gibson 2012), the project has the potential to generate approximately 1,240 average daily trips (ADT), including 49 trips in the a.m. peak hour and 124 trips in the p.m. peak hour. The proposed revitalization project is primarily focused on the net increase of approximately 35,417 sf GLA within Westfield Carlsbad. Table 4.2-6, *Net Operational Emissions*, presents the operational emissions estimates associated with the proposed SDP, which factors in the criteria pollutant emissions resulting from the net increase of approximately 35,417 sf GLA.

**Table 4.2-6**
**NET OPERATIONAL EMISSIONS**

| | **ROGs** | **$NO_x$** | **CO** | **$SO_x$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| | Pounds/day[1] | | | | | |
| Area | 0.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Energy | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 |
| Mobile | 4.07 | 7.46 | 32.72 | 0.07 | 7.55 | 0.44 |
| Waste | - | - | - | - | - | - |
| Water | - | - | - | - | - | - |
| **TOTAL** | **5.05** | **7.48** | **32.74** | **0.07** | **7.55** | **0.44** |
| Significance Screening Criteria | 137 | 250 | 550 | 250 | 100 | 55 |
| ***Above Screening Criteria?*** | ***No*** | ***No*** | ***No*** | ***No*** | ***No*** | ***No*** |

| Table 4.2-6 (cont.)<br>NET OPERATIONAL EMISSIONS | | | | | | |
|---|---|---|---|---|---|---|
| | **ROGs** | **$NO_x$** | **CO** | **$SO_x$** | **$PM_{10}$** | **$PM_{2.5}$** |
| | Tons/year | | | | | |
| Area | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Energy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mobile | 0.69 | 1.29 | 5.97 | 0.01 | 1.21 | 0.08 |
| Waste | - | - | - | - | - | - |
| Water | - | - | - | - | - | - |
| **TOTAL** | **0.87** | **1.29** | **5.97** | **0.01** | **1.21** | **0.08** |
| Significance Screening Criteria | 15 | 40 | 100 | 100 | 15 | 10 |
| ***Above Screening Criteria?*** | ***No*** | ***No*** | ***No*** | ***No*** | ***No*** | ***No*** |

Source: HELIX 2012a
[1] Maximum of summer and winter daily emissions

As illustrated in Table 4.2-6, the net operational emissions associated with the proposed SDP are anticipated to be below the significance criteria and would therefore be less than significant.

**Sensitive Receptors/CO "Hot Spots"**

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations known as CO "hot spots" may reach unhealthy levels with respect to local sensitive land uses such as residential areas, schools and hospitals.

To verify that the project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO "hot spots" was conducted. The project Transportation Study (Gibson 2012) evaluated whether or not there would be a decrease in the level of service (LOS) at the roadways and/or intersections affected by the proposed SDP. The potential for CO "hot spots" was evaluated based on the results of the Transportation Study. The Caltrans Transportation Project-Level Carbon Monoxide Protocol was followed to determine whether a CO "hot spot" is likely to form due to project-generated traffic. In accordance with the Caltrans Protocol, CO "hot spots" are typically evaluated when (a) the LOS of an intersection or roadway decreases to a LOS E or worse; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection or roadway segment.

The Transportation Study evaluated eighteen intersections in the vicinity of the SP area to evaluate the LOS under the Existing Conditions, Near-Term Conditions (Existing Conditions with Cumulative Projects), Near-Term Conditions with Project, Horizon Year Conditions (2030) and Horizon Year with Project (2030) (Gibson 2012). Table 4.2-7, *Intersection Peak Hour Level of Service Summary*, presents a summary of the peak hour LOS for each of the intersections evaluated.

**Table 4.2-7**
**INTERSECTION PEAK HOUR LEVEL OF SERVICE SUMMARY**

| Intersection | Existing Conditions | | Near Term Conditions (2020) Without Project | | Near Term Condition with Project (2020) | | Horizon Year Conditions (2030) Without Project | | Horizon Year Conditions with Project (2030) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| El Camino Real / Fire Mountain Drive | B | B | B | B | B | B | B | B | B | B |
| Jefferson Street / Vista Way/Ivy Road | C | C | C | C | C | C | C | C | C | C |
| El Camino Real / Vista Way | B | D | C | D | C | D | B | D | B | D |
| Rancho del Oro Road / Vista Way | C | C | C | C | C | C | C | C | C | C |
| Jefferson Street / SR 78 Westbound Ramps | B | C | B | B | B | B | B | E | B | E |
| Jefferson Street / SR 78 Eastbound Ramps | B | C | B | C | B | C | B | C | B | C |
| El Camino Real / SR 78 Westbound Ramps | B | C | B | C | B | C | B | C | B | C |
| El Camino Real / SR 78 Eastbound Ramps | C | C | C | C | C | C | C | C | C | C |
| El Camino Real / Plaza Drive | A | A | C | C | C | C | C | C | C | C |
| Jefferson Street / Marron Road | A | A | C | D | C | D | C | D | C | D |
| Monroe Street / Marron Road | A | A | C | D | C | D | C | D | C | D |
| Project Driveway / Marron Road | A | A | A | B | B | B | A | B | A | B |
| El Camino Real / Marron Road | A | B | C | D | C | D | C | D | C | D |
| I-5 Southbound Ramps / Carlsbad Village Drive | A | A | C | C | C | C | C | C | C | C |
| I-5 Northbound Ramps / Carlsbad Village Drive | A | B | C | C | C | C | C | C | C | C |
| Monroe Street / Carlsbad Village Drive | A | A | C | D | C | D | C | D | C | D |
| El Camino Real / Carlsbad Village Drive | A | A | C | D | C | D | C | D | C | D |
| El Camino Real / Hosp Way | A | A | C | C | C | C | C | C | C | C |

Note: The Jefferson Street and SR78 westbound ramps are operating at LOS E during the p.m. peak hours at horizon year without the project.
Source: Gibson 2012

Based on the Transportation Study (Gibson 2012), project-generated traffic would not cause a significant degradation to LOS E or worse for any of the intersections analyzed. Therefore, no CO "hotspot" modeling analysis is required.

**Exposure of Sensitive Receptors to TACs**

The exposure of sensitive receptors to emissions of TACs from on-site construction-related and operational sources is discussed separately below.

Construction-Related TAC Equipment Emissions

Diesel particulate matter (DPM) is not included as a criteria pollutant. However, it is recognized by the state of California as carcinogenic compounds. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure. DPM would be emitted from heavy equipment used in the construction process. The anticipated SDP construction period of just over 20 months would be much less than the 70-year period used for risk determination. Because of the short-term nature of project construction and the fact that heavy equipment exhaust emissions are not significant, exposure to diesel exhaust emissions during construction would not be significant.

Operation Related Mobile and Area TAC Sources

Mobile sources of TACs could include proposed land uses that involve the long-term use of heavy-duty diesel trucks. Implementation of the proposed SDP would include development of commercial land uses, which may include facilities that require the long-term use of heavy-duty diesel trucks (e.g., loading docks). The operation of such a source could result in the exposure of sensitive receptors, especially those within proximity, to TACs that exceed the significance threshold.

Sources of TAC emissions include diesel-fueled engine and possible food-service facility operations. Delivery truck travel, truck idling, and operation of the emergency back-up power generator are emission sources of particulate matter from diesel-fueled engines. Trucks entering and leaving the SP area would include deliveries associated with the retail stores, gas stations and possibly food service establishments. Trucks would be limited to an idle time not to exceed five minutes for entering or exiting a truck delivery well, in accordance with California State Legislation. The loading delivery docks are the only locations where routine truck idling associated with operation of the project would be expected.

Many of the types of tenants that would occupy retail space within the SP area are currently unknown. It is possible that restaurants could be included as tenants and such uses emit organic gases from the cooking of animal fats and oils. Emissions from each restaurant would be controlled through an exhaust hood connected to a roof-top vent. It is possible that operation of the restaurant(s) would require use of trucks equipped with transportation refrigeration storage units (TRUs) to deliver cold-stored food items. Trucks equipped with TRUs typically result in higher TAC emissions, because they are equipped with diesel generator sets to keep perishable food cold, in addition to diesel engine exhaust from the truck. However, it is not anticipated that the future retail establishments would experience high truck volumes delivering materials on a frequent basis (i.e., greater than 100 commercial trucks per day or 40 TRU-equipped trucks per day as defined by CARB as the screening level).

Therefore, on-site or off-site sensitive receptors would not be exposed to substantial TAC concentrations from these sources, and a less than significant impact would occur.

**Objectionable Odors**

Construction Odors

The only source of odor anticipated from the construction of the proposed SDP would be exhaust emissions from the diesel equipment and haul trucks. The expected construction period of less than two years (approximately 20 months) would be much less than the 70-year period used for odor risk determination. Thus, the temporary use of off-road heavy-duty diesel equipment in combination with the highly dispersive properties of diesel PM would not expose sensitive receptors to substantial construction-related odor generation. Based on the distance to the nearest sensitive receptor from the source of odiferous emissions and the small number of diesel-powered vehicles on site, potential construction-phase odor impacts are expected to be less than significant.

Operational Odors

During the operational phase, the proposed commercial retail land uses are not anticipated to be sources of nuisance odors. In addition, the majority of uses surrounding the site are commercial in nature, although residential development is situated near the El Camino Real/Marron Road intersection, above the proposed building site. Because a considerable number of receptors would not be affected by the project, the potential for odor impacts associated with project operations are expected to be less than significant.

### 4.2.4 Mitigation Measures

**Construction Impacts**

No mitigation measures are proposed as no significant construction-phase impacts associated with air quality have been identified.

**Operational Impacts**

No mitigation measures are proposed as no significant operational phase air quality impacts associated with air quality have been identified.

### 4.2.5 Level of Significance after Mitigation

**Construction Impacts**

No significant impact associated with short-term air quality standards, criteria pollutants, or exposure to sensitive receptors has been identified. Although particulate matter emissions are projected to be below a level of significance, the construction team would employ standard fugitive dust control measures in compliance with SDAPCD Rule 55 to further protect the immediately surrounding communities from construction-related dust. Impacts would be less than significant.

**Operational Impacts**

No significant operational phase air quality impacts associated with air quality standards, criteria pollutants, and exposure to sensitive receptors have been identified, and impacts would be less than significant.