

3.2 Air Quality

Environmental Setting

PHYSICAL SETTING

The weather of the San Diego region, as in most of Southern California, is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average temperature ranges (in degrees Fahrenheit (°F)) from the mid-40s to the high 90s. Most of the region's precipitation falls from November to April with infrequent (approximately 10%) precipitation during the summer. The average seasonal precipitation along the coast is approximately 10 inches; the amount increases with elevation as moist air is lifted over the mountains to the east.

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east. Along with local meteorology, the topography influences the dispersal and movement of pollutants in the basin. The mountains to the east prohibit dispersal of pollutants in that direction and help trap them in inversion layers.

The interaction of ocean, land, and the Pacific High Pressure Zone maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). Local terrain is often the dominant factor inland that affects wind patterns, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

Climate and Meteorology

Carlsbad is located within the San Diego Air Basin (SDAB or basin) and is subject to the San Diego Air Pollution Control District (SDAPCD) guidelines and regulations. The SDAB is one of 15 air basins that geographically divide the State of California. The SDAB is currently classified as a federal nonattainment area for ozone (O₃) and a state nonattainment area for particulate matter less than or equal to 10 microns (PM₁₀), particulate matter less than or equal to 2.5 microns (PM_{2.5}), and O₃.

The SDAB lies in the southwest corner of California and comprises the entire San Diego region, covering 4,260 square miles, and is an area of high air pollution potential. The basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The SDAB experiences frequent temperature inversions. Subsidence inversions occur during the warmer months as descending air associated with the Pacific High Pressure Zone meets cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. Another 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 also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce O₃, commonly known as smog.

Light daytime winds, predominately from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and oxides of nitrogen (NO_x) emissions. CO concentrations are generally higher in the morning and late evening. In the morning, CO levels are elevated due to cold temperatures and the large number of motor vehicles traveling. Higher CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the basin are associated with heavy traffic. Nitrogen dioxide (NO₂) levels are also generally higher during fall and winter days.

Under certain conditions, atmospheric oscillation results in the offshore transport of air from the Los Angeles region to San Diego County. This often produces high O₃ concentrations, as measured at air pollutant monitoring stations within the county. The transport of air pollutants from Los Angeles to San Diego has also occurred within the stable layer of the elevated subsidence inversion, where high levels of O₃ are transported.

Sensitive Receptors

Reduced visibility, eye irritation, and adverse health impacts upon those persons termed sensitive receptors are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution, as identified by the California Air Resources Board (CARB), include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Accordingly, the proposed planning area would house sensitive receptors.

Pollutants and Health Effects

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O₃, NO₂, CO, sulfur dioxide (SO₂), PM₁₀, PM_{2.5}, and lead. These pollutants are

discussed below, based on the U.S. Environmental Protection Agency (EPA) Six Common Air Pollutants and the CARB Glossary of Air Pollutant Terms.¹ In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O₃ is a colorless gas that is formed in the atmosphere when volatile organic compounds (VOCs), sometimes referred to as reactive organic gases (ROGs), and NO_x react in the presence of ultraviolet sunlight. O₃ is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of VOCs and NO_x, the precursors of O₃, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in O₃ formation and ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. Short-term exposures (lasting for a few hours) to O₃ at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.

Nitrogen Dioxide. Most NO₂, like O₃, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO₂ are collectively referred to as NO_x and are major contributors to O₃ formation. High concentrations of NO₂ can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility. There is some indication of a relationship between NO₂ and chronic pulmonary fibrosis and some increase in bronchitis in children (2 and 3 years old) has also been observed at concentrations below 0.3 parts per million by volume (ppm).

Carbon Monoxide. CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as Carlsbad, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions; primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. The highest levels of CO typically occur during the colder months of the year when inversion conditions are more frequent. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO₂ is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Main sources of SO₂ are coal and oil used in power plants and industries; as such, the highest levels of SO₂ are generally found near large industrial complexes. In recent years, SO₂ concentrations have been reduced by the increasingly stringent controls placed on

¹EPA. 2010. "Six Common Air Pollutants." Air and Radiation. July 1, 2010. <http://www.epa.gov/air/urbanair>.
CARB (California Air Resources Board). "Glossary of Air Pollutant Terms." CARB website.
<http://www.arb.ca.gov/html/gloss.htm>.

stationary source emissions of SO₂ and limits on the sulfur content of fuels. SO₂ is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. SO₂ can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. PM_{2.5} and PM₁₀ represent fractions of particulate matter. Fine particulate matter, or PM_{2.5}, is roughly 1/28 the diameter of a human hair. PM_{2.5} results from fuel combustion (e.g., motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, PM_{2.5} can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOC. Inhalable or coarse particulate matter, or PM₁₀, is about 1/7 the thickness of a human hair. Major sources of PM₁₀ include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

PM_{2.5} and PM₁₀ pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM_{2.5} and PM₁₀ can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport absorbed gases, such as chlorides or ammonium, into the lungs, also causing injury. Whereas PM₁₀ tends to collect in the upper portion of the respiratory system, PM_{2.5} is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline, the manufacturing of batteries, paint, ink, ceramics, and ammunition and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance including intelligence quotient performance, psychomotor performance, reaction time, and growth.

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. A toxic substance released into the air is considered a toxic air

contaminant (TAC). Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced either on short-term (acute) or long-term (chronic) exposure to a given TAC. CARB has identified diesel engine exhaust particulate matter as the predominant TAC in California. Diesel particulate matter (DPM) is emitted into the air by diesel-powered mobile vehicles, including heavy-duty diesel trucks, construction equipment, and passenger vehicles. Certain ROGs may also be designated as TACs.

Local Air Quality

SDAB Attainment Designation

An area is designated in attainment when it is in compliance with the National Ambient Air Quality Standards (NAAQS) (federal) and/or California Ambient Air Quality Standards (CAAQS) (state). These standards are set by the EPA or CARB for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or the public welfare. Table 3.2-4 in the “Regulatory Setting” section, below, lists the current NAAQS and CAAQS.

The criteria pollutants of primary concern that are considered in this air quality assessment include O₃, NO₂, CO, SO₂, PM₁₀, and PM_{2.5}. Although there are no ambient standards for VOCs or NO_x, they are important as precursors to O₃.

The SDAB is designated by EPA as a marginal nonattainment area for the 2008 8-hour NAAQS for O₃. The SDAB is designated in attainment for all other criteria pollutants under the NAAQS with the exception of PM₁₀, which was determined to be unclassifiable. The SDAB is currently designated nonattainment for O₃ and particulate matter, PM₁₀ and PM_{2.5}, under the CAAQS. It is designated attainment for the CAAQS for CO, NO₂, SO₂, lead, and sulfates. Table 3.2-1, SDAB Attainment Classification, summarizes the SDAB’s federal and state attainment designations for each of the criteria pollutants.

Table 3.2-1: SDAB Attainment Classification

Pollutant	Federal Designation ^a	State Designation ^b
O ₃ (1 hour)	Attainment ¹	Nonattainment
O ₃ (8-hour – 1997) (8-hour – 2008)	Attainment (Maintenance) Nonattainment (Marginal)	Nonattainment
CO	Unclassifiable/Attainment ²	Attainment
PM ₁₀	Unclassifiable ³	Nonattainment
PM _{2.5}	Attainment	Nonattainment
NO ₂	Unclassifiable/Attainment	Attainment
SO ₂	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen Sulfide	(no federal standard)	Unclassified
Visibility-Reducing Particles	(no federal standard)	Unclassified

1 The federal 1-hour standard of 0.12 ppm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in state implementation plans.

2 The western and central portions of the SDAB are designated attainment (maintenance), while the eastern portion is designated unclassifiable/attainment.

3 At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

Sources:

^aEPA. "Region 9: Air Programs, Air Quality Maps." Last updated April 8, 2013. Accessed: February 26, 2015. http://www.epa.gov/region9/air/maps/maps_top.html;

^bCARB. "Area Designations Maps/State and National." (Last reviewed on April/August 22, 2013/2014.) Accessed: March 5, 2015. <http://www.arb.ca.gov/DESIGN/ADM/ADM.htm>.

Air Quality Monitoring Data

The SDAPCD operates a network of ambient air monitoring stations throughout San Diego County, which measure ambient concentrations of pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The SDAPCD monitors air quality conditions at 10 locations throughout the basin. Due to its proximity to Carlsbad and similar geographic and climactic characteristics, the Del Mar–Mira Costa College monitoring station concentrations for 8-hour and 1-hour O₃ are considered most representative of O₃ in Carlsbad. The Escondido–East Valley Parkway monitoring station is the nearest location to Carlsbad where PM₁₀, PM_{2.5}, NO₂, and CO concentrations are monitored. The ~~San Diego 1110 Beardsley Street~~ El Cajon – Redwood Avenue monitoring station is the nearest location to Carlsbad where SO₂ concentrations are monitored. Ambient concentrations of pollutants from ~~2009–2010 through 2012–2013~~ are presented in Table 3.2-2. The number of days exceeding the ambient air quality standards (state and federal) is shown in Table 3.2-3. The state 8-hour O₃ standards were exceeded in ~~2009, 2010, 2011, and 2012~~; the state 1-hour standards were exceeded in ~~2009~~, while the federal 8-hour O₃ standard was exceeded in ~~2009 and 2012~~, and the state 1-hour standard was not exceeded any time during this monitoring period. The state 24-hour PM₁₀ standard was exceeded in ~~2009~~ 2013; the state annual PM₁₀ standard was exceeded in ~~2009 and 2010~~ and 2013; and the federal 24-hour PM_{2.5} standard was exceeded in ~~2009, 2010, 2011, and 2010, 2012 and 2013~~. Air quality within

the region was in compliance with both CAAQS and NAAQS for NO₂, CO, and SO₂ during this monitoring period.

Table 3.2-2: Ambient Air Quality Data (ppm unless otherwise indicated)

Pollutant	Averaging Time	2010 ⁹	2011 ⁹	2012 ⁺	2013 [±]	Most Stringent	Monitoring Station
						Ambient Air Quality Standard	
O ₃	8-hour	0.07284	0.0752	0.0795	0.0709	0.070	Del Mar–Mira Costa College
	1-hour	0.8597	0.09185	0.08891	0.07688	0.090	
PM ₁₀	Annual	24.621.0 µg/m ³	21.018.8 µg/m ³	18.18 µg/m ³	1823.1 µg/m ³	20 µg/m ³	Escondido–East Valley Parkway
	24-hour	7443.0 µg/m ³	403.0 µg/m ³	4033.0 µg/m ³	3382.0 µg/m ³	50 µg/m ³	
PM _{2.5}	Annual ¹	13.412.2 µg/m ³	12.210.4 µg/m ³	10.84 µg/m ³	10.58 µg/m ³	12 µg/m ³	Escondido–East Valley Parkway
	24-hour	78.452.2 µg/m ³	52.227.4 µg/m ³	27.470.7 µg/m ³	70.756.3 µg/m ³	35 µg/m ³	
NO ₂	Annual	0.0146	0.0134	0.013	0.013	0.030	Escondido–East Valley Parkway
	1-hour	0.06473	0.0624	0.062	0.0612	0.180	
CO	8-hour	2.463.54	2.302.46	3.702.30	2.603.70	9.0	Escondido–East Valley Parkway
	1-hour ²	3.904.40	3.503.90	4.403.50	3.204.40	20	
	Annual	0.0001	0.000	—	—	0.030	San Diego–1110 Beardsley Street–El Cajon – Redwood Ave
SO ₂	24-hour	0.0026	0.0012	0.0013	0.001—	0.040	San Diego–1110 Beardsley Street–El Cajon – Redwood Ave

µg/m³ = micrograms per cubic meter

Data represent maximum values

¹ Federal data reflected for 2009, 2010, and 2012; not determined for California method.

² Data were taken from EPA, “Monitor Values Report.”

Sources:

CARB. “Air Quality Data Statistics.” 2013-2014. Available: <http://arb.ca.gov/adam>.

EPA. “Monitor Values Report.” Last updated May 3, 2013-October 8, 2014. Available: http://www.epa.gov/airdata/ad_rep_mon.html.

Table 3.2-3: Frequency of Air Quality Standard Violations

Monitoring Site	Year	Number of Days Exceeding Standard				Federal 24-hour PM _{2.5}
		State 1-Hour O ₃	State 8-Hour O ₃	Federal 8-Hour O ₃	State 24-hour PM ₁₀	
Del Mar–Mira Costa College	2010 2009	<u>0</u> ⁺	<u>2</u> ³	<u>0</u> ⁺	—	—
	2011 2010	0	<u>1</u> ²	0	—	—
	2012 2011	0	<u>2</u> ⁺	<u>0</u> ⁰	—	—
	2013 2012	0	<u>0</u> ²	<u>0</u> ²	—	—
Escondido–East Valley Parkway	2010 2009	—	—	—	<u>0.0</u> (0) ⁵⁻⁶ (⁺)	<u>0.0</u> (0) ²⁻⁰ (⁻)
	2011 2010	—	—	—	0.0 (0)	<u>0.0</u> (0) ²⁻⁰ (⁻)
	2012 2011	—	—	—	0.0 (0)	3.0 ¹ (3)
	2013 2012	—	—	—	<u>6.0</u> (1) ⁰⁻⁰ (⁰)	1.0 ¹ -(1)

¹ Measurements of PM₁₀ and PM_{2.5} are usually collected every 6 days and daily, respectively. “Number of days exceeding the standards” is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Source: CARB. “Air Quality Data Statistics.” ~~2013~~2014. Available: <http://arb.ca.gov/adam>

REGULATORY SETTING

Federal Regulations

Clean Air Act

The Federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including the setting of NAAQS for major air pollutants, hazardous air pollutant standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O₃ protection, and enforcement provisions. NAAQS are established for “criteria pollutants” under the Clean Air Act, which are O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O₃, NO₂, SO₂, PM₁₀, PM_{2.5}, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O₃, NO₂, SO₂, PM₁₀, and PM_{2.5} are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan (SIP) that demonstrates how those areas will attain the standards within mandated time frames.

State Regulations

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts (AQMDs) and air pollution control districts (APCDs) at the regional and county levels. CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established CAAQS, which are generally more restrictive than the NAAQS.² The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. The CAAQS for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, PM₁₀, and PM_{2.5} and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 3.2-4, Ambient Air Quality Standards.

² CARB. 2013. "Ambient Air Quality Standards." <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>

Table 3.2-4: Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS ¹	NAAQS Standards ²	
		Concentration ³	Primary ^{3,4}	Secondary ^{3,5}
O ₃	1 hour	0.09 ppm (180 µg/m ³)	—	Same as Primary Standard
	8 hour	0.070 ppm (137 µg/m ³)	0.075 ppm (147 µg/m ³)	
CO	1 hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	—
	8 hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
NO ₂ ⁶	1 hour	0.18 ppm (339 µg/m ³)	0.100 ppm (188 µg/m ³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)	
SO ₂ ⁷	1 hour	0.25 ppm (655 µg/m ³)	0.75 ppm (196 µg/m ³)	—
	3 hour	—	—	0.5 ppm (1300 µg/m ³)
	24 hour	0.04 ppm (105 µg/m ³)	0.14 ppm (for certain areas) ⁷	—
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas) ⁷	—
PM ₁₀ ⁸	24 hour	50 µg/m ³	150 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m ³	—	
PM _{2.5} ⁸	24 hour	—	35 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m ³	12.0 µg/m ³	15.0 µg/m ³
Lead ^{9,10}	30-day Average	1.5 µg/m ³	—	Same as Primary Standard
	Calendar Quarter	—	1.5 µg/m ³ (for certain areas) ¹⁰	
	Rolling 3-Month Average	—	0.15 µg/m ³	
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m ³)	—	—
Vinyl chloride ⁹	24 hour	0.01 ppm (26 µg/m ³)	—	—
Sulfates	24 hour	25 µg/m ³	—	—
Visibility reducing particles ¹¹	8 hour (10:00 a.m. to 6:00 p.m. PST)	See footnote 11	—	—

ppm= parts per million by volume µg/m³ = micrograms per cubic meter mg/m³= milligrams per cubic meter

Table 3.2-4: Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS ¹	NAAQS Standards ²	
		Concentration ³	Primary ^{3,4}	Secondary ^{3,5}
<p>1 California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.</p> <p>2 National standards (other than O₃, NO₂, SO₂, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For NO₂ and SO₂, the standard is attained when the 3-year average of the 98th and 99th percentile, respectively, of the daily maximum 1-hour average at each monitor within an area does not exceed the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.</p> <p>3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.</p> <p>4 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.</p> <p>5 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.</p> <p>6 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 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.</p> <p>7 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 1 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.</p> <p>8 On December 14, 2012, the national annual PM_{2.5} primary standard was lowered from 15 µg/m³ to 12 µg/m³. The existing national 24-hour PM_{2.5} standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM₁₀ standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.</p> <p>9 CARB 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.</p> <p>10 The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until 1 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.</p> <p>11 In 1989, the ARB 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.</p>				

Local Regulations

San Diego Air Pollution Control District

While CARB is responsible for the regulation of mobile emission sources within the state, local AQMDs and APCDs are responsible for enforcing standards and regulating stationary sources. Carlsbad is located within the SDAB and is subject to SDAPCD guidelines and regulations. In San Diego County, O₃ and particulate matter are the pollutants of main concern, since exceedances of state ambient air quality standards for those pollutants are experienced here in most years. For this reason and as shown in Table 3.2-1 above, the SDAB has been designated as a nonattainment area for the state PM₁₀, PM_{2.5}, and O₃ (1-hour and 8-hour) standards. Table 3.2-1, above, also shows that the SDAB is a federal O₃ marginal nonattainment area for the 2008 8-hour NAAQS for O₃ and a CO maintenance area.

The SDAPCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis (most recently in 2009). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O₃. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in San Diego County and the cities in the county, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by San Diego County and the cities in the county as part of the development of their general plans.

The Eight-Hour Ozone Attainment Plan for San Diego County indicates that local controls and state programs would allow the region to reach attainment of the federal 8-hour O₃ standard by 2009.³ SDAPCD relies on the RAQS to demonstrate how the region will comply with the federal O₃ standard. The RAQS details how the region will manage and reduce O₃ precursors (NO_x and VOCs) by identifying measures and regulations intended to reduce these contaminants. The control measures identified in the RAQS generally focus on stationary sources; however, the emissions inventories and projections in the RAQS address all potential sources, including those under the authority of CARB and the EPA. Incentive programs for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS.

In December 2005, SDAPCD prepared a report titled "Measures to Reduce Particulate Matter in San Diego County" to address implementation of Senate Bill (SB) 656 in San Diego County (SB 656 required additional controls to reduce ambient concentrations of PM₁₀ and PM_{2.5}).⁴ In the

³ SDAPCD. *Eight-Hour Ozone Attainment Plan for San Diego County*. May 2007. <http://www.sdapcd.org/planning/8-Hour-O3-Attain-Plan.pdf>

⁴ SDAPCD. *Measures to Reduce Particulate Matter in San Diego County*. December 2005. <http://www.sdapcd.org/planning/PM-Measures.pdf>

report, SDAPCD evaluates the implementation of source-control measures that would reduce particulate matter emissions associated with residential wood combustion.

As stated above, the SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations would apply to construction that occurs pursuant to the proposed General Plan and some of the proposed stationary sources:

- **SDAPCD Regulation II: Permits; Rule 10: Permits Required.** Requires that any person building, erecting, altering, or replacing any article, machine, equipment or other contrivance, the use of which may cause the issuance of air contaminants, shall receive written authorization (Authority to Construction) and a Permit to Operate from the SDAPCD.⁵
- **SDAPCD Regulation II: Permits; Rule 20.1: New Source Review – General Provisions.** Establishes the general provisions, including exemptions, definitions, and emission calculations, that apply to any new or modified emission unit, any replacement emission unit, any relocated emission unit or any portable emission unit for which an Authority to Construct or Permit to Operate is required.⁶
- **SDAPCD Regulation II: Permits; Rule 20.2: New Source Review – Non-Major Sources.** Applies to any new or modified stationary source, to any new or modified emission unit and to any relocated emission unit that is not considered a major stationary source. As applied to new or modified sources, the rule requires (1) the use of Best Available Control Technology (BACT) where the emissions of PM₁₀, NO_x, VOC, or SO_x would increase by 10 pounds per day or more; (2) an air quality impact analysis if the emissions of PM₁₀, NO_x, VOC, SO_x, or lead exceed designated trigger levels; and (3) establishes public noticing requirements prior to issuance of a permit.⁷
- **SDAPCD Regulation IV: Prohibitions; Rule 50: Visible Emissions.** Prohibits any activity causing air contaminant emissions darker than 20% opacity for more than an aggregate of 3 minutes in any consecutive 60-minute time period. In addition, Rule 50 prohibits any diesel pile-driving hammer activity causing air contaminant emissions for a period or periods aggregating more than 4 minutes during the driving of a single pile.⁸
- **SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance.** Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or

⁵ SDAPCD. *Rules and Regulations, Regulation II, Permits, Rule 10 Permits Required.* Amended April 27, 2000.

⁶ SDAPCD. *Rules and Regulations, Regulation II, Rule 20.1, New Source Review – General Provisions.* Revised November 4, 1998, Effective December 17, 1998.

⁷ SDAPCD. *Rules and Regulations, Regulation II, Rule 20.2, New Source Review – Non-Major Sources.* Revised November 4, 1998, Effective December 17, 1998.

⁸ SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 50, Visible Emissions.* Amended August 13, 1997.

have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property.⁹

- **SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust.** Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project site.¹⁰
- **SDAPCD Regulation IV: Prohibitions; Rule 67.0: Architectural Coatings.** Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.¹¹
- **SDAPCD Regulation IV: Prohibitions; Rule 69.2: Industrial and Commercial Boilers, Process Heaters and Steam Generators.** Prescribes NO_x and CO emission limits for existing and new boilers, process heaters, and steam generators rated at 5 million British thermal units (Btu) per hour or more. The rule also includes recordkeeping and source testing requirements.¹²
- **SDAPCD Regulation IV: Prohibitions; Rules 69.3 and 69.3.1: Stationary Gas Turbine Engines.** Prescribes NO_x emission limits for stationary gas turbine engines, corresponding to Reasonably Available Control Technology and Best Available Retrofit Technology, respectively, as well as monitoring and recordkeeping requirements. The rules apply to gas turbine engines rated at greater than 0.3 megawatts (300 kW).¹³
- **SDAPCD Regulation IV: Prohibitions; Rule 69.4.1: Stationary Reciprocating Internal Combustion Engines.** Prescribes NO_x, VOC, and CO emission limits for existing and new internal combustion engines as well as monitoring and recordkeeping requirements. The requirements are limited for new emergency standby engines that operate less than 52 hours per year for non-emergency purposes.¹⁴
- **SDAPCD Regulation XII: Prohibitions; Rule 1200: Toxic Air Contaminants – New Source Review.** Applies to any new, relocated, or modified emission unit which may

⁹ SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 51, Nuisance.* Effective January 1, 1969.

¹⁰ SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 55, Fugitive Dust.* Adopted June 24, 2009, Effective December 24, 2009.

¹¹ SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 67, Architectural Coatings.* Revised December 12, 2001.

¹² SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 69.2, Industrial and Commercial Boilers, Process Heaters and Steam Generators.* Adopted September 27, 1994.

¹³ SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 69.3, Stationary Gas Turbine Engines – Reasonably Available Control Technology.* Revised, Effective December 16, 1998.

¹⁴ SDAPCD. *Rules and Regulations, Regulation IV, Prohibitions, Rule 69.4.1, Stationary Reciprocating Internal Combustion Engines.* Adopted November 15, 2000.

increase emissions of one or more TACs that requires an Authority to Construct or Permit to Operate. The rule establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional TACs. Under Rule 1200, permits to operate may not be issued when emissions of TACs result in an incremental cancer risk greater than 1 in 1 million without application of Toxics-BACT (T-BACT), or an incremental cancer risk greater than 10 in 1 million with application of T-BACT, or a health hazard index (chronic and acute) greater than one.¹⁵

- **SDAPCD Regulation XI: National Emission Standards for Hazardous Air Pollutants; Subpart M, Rule 361.145: Standard for Demolition and Renovation.** Requires owners and operators of a demolition or renovation activity to provide written notification of planned asbestos stripping or removal to the Control Officer no less than 10 days prior to demolition and/or asbestos removal. A Notification of Demolition and Renovation Form and fee is required with written notification. Procedures for asbestos emission control are provided under Rule 361.145 and must be followed in accordance with this regulation.¹⁶

Impact Analysis

SIGNIFICANCE CRITERIA

For the purposes of this Program EIR, a significant impact would occur if the proposed General Plan would:

- Conflict with or obstruct the implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for O₃ precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

SDAPCD

As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 requiring the preparation of air quality impact assessments for permitted stationary sources. The SDAPCD sets forth quantitative emission thresholds below which a stationary source would not

¹⁵ SDAPCD. *Rules and Regulations, Regulation XII, Toxic Air Contaminants, Rule 1200, Toxic Air Contaminant – New Source Review*. Effective June 12, 1996.

¹⁶ SDAPCD. *Rules and Regulations, Regulation XI, National Emission Standards for Hazardous Air Pollutants, Subpart M, Rule 361.145, Standard for Demolition and Renovation*. Adopted February 1, 1995.

have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 3.2-5, SDAPCD Air Quality Significance Thresholds, are exceeded.

Table 3.2-5: SDAPCD Air Quality Significance Thresholds

Construction Emissions			
<i>Pollutant</i>	<i>Total Emissions (Pounds per Day)</i>		
Respirable Particulate Matter (PM ₁₀)	100		
Fine Particulate Matter (PM _{2.5})	55		
Oxides of Nitrogen (NO _x)	250		
Oxides of Sulfur (SO _x)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOC)	137*		

Operational Emissions			
<i>Pollutant</i>	<i>Total Emissions</i>		
	<i>Pounds per Hour</i>	<i>Pounds per Day</i>	<i>Tons per Year</i>
Respirable Particulate Matter (PM ₁₀)	—	100	15
Fine Particulate Matter (PM _{2.5})	—	55	10
Oxides of Nitrogen (NO _x)	25	250	40
Sulfur Oxides (SO _x)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	—	3.2	0.6
Volatile Organic Compounds (VOC)	—	137*	13.7

* VOC threshold based on the significance thresholds recommended by the Monterey Bay Unified Air Pollution Control District for the North Central Coast Air Basin, which has similar federal and state attainment status as the SDAB for O₃.

Sources:

City of San Diego. California Environmental Quality Act: Significance Determination Thresholds.
<http://www.sandiego.gov/development-services/pdf/news/sdtceqa.pdf>

SDAPCD. Rules and Regulations, Regulation XV, Federal Conformity, Rule 1501, Conformity with General Federal Actions. Adopted March 7, 1995.

SDAPCD. Rules and Regulations, Regulation II, Rule 20.2, New Source Review – Non-Major Sources.

The thresholds listed in Table 3.2-5 represent screening-level thresholds that can be used for CEQA purposes to evaluate whether project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the CAAQS and NAAQS, including appropriate background levels. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 3.2-5, the project could have the potential to

result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

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

METHODOLOGY AND ASSUMPTIONS

Information and analysis have been compiled based on an understanding of the existing ambient air quality of the SDAB and review of existing technical data, aerial maps, and applicable laws, regulations, and guidelines. Traffic data and trip generation information was derived from the project's traffic impact analysis prepared by Fehr and Peers for the year 2008 (existing conditions) and 2035 (both with and without buildout of the proposed General Plan).¹⁷ The URBEMIS 2007 model, Version 9.2.4, land use and air emissions model was then utilized to estimate daily emissions from proposed vehicular sources for the year 2008 (existing conditions) as shown in Table 3.2-7, and the buildout year 2035 as shown in Table 3.2-10.¹⁸ The existing conditions data is included in this discussion for disclosure purposes only, while the 2035 data is utilized to assess project-related impacts.

URBEMIS 2007 default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances, were conservatively used for the model inputs. General Plan-related traffic was assumed to be comprised of a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2008 (existing conditions) and 2035 (buildout year, based on proposed General Plan) were used to estimate emissions associated with ~~the proposed General Plan~~ mobile sources. In addition to estimating mobile source emissions, the URBEMIS 2007 model was also used to estimate emissions from Carlsbad's area sources, which include other natural gas combustion, landscaping (which would not produce winter emissions), and architectural coatings for maintenance for the year 2008 (existing conditions) and 2035 (buildout based on proposed General Plan).

Table 3.2-6, Assumptions for General Plan Development through 2035, shows the net increase in land uses that are estimated to result from implementation of the proposed General Plan. The information provided in Table 3.2-6 were used for model inputs to calculate the net increase in emissions associated with the proposed project.

¹⁷ Fehr and Peers. Trip Generation Estimates. 2013.

¹⁸ Jones & Stokes Associates. *Software User's Guide: URBEMIS2007 for Windows; Emissions Estimation for Land Use Development Projects*. Version 9.2. Prepared for the South Coast Air Quality Management District. November 2007. <http://www.urbemis.com/support/manual.html>.

**Table 3.2-6: Assumptions for General Plan
 Development through 2035**

<u>Category</u>	<u>Assumption</u>
<u>Total New Development</u>	
<u>Housing Units</u>	<u>7,880</u>
<u>Commercial (sf)</u>	<u>2,132,200</u>
<u>Office Space (sf)</u>	<u>778,500</u>
<u>Industrial (sf)</u>	<u>4,600,400</u>
<u>Hotel Rooms</u>	<u>2,360</u>

Source: Land uses and associated trip generation - Fehr and Peers 2013

Existing (2008) emissions are shown in Table 3.2-7 and Table 3.2-10 shows the resulting emissions from the net increase in land uses and associated vehicle trips for 2035 (buildout of the proposed General Plan).

Table 3.2-7: Estimated Daily Maximum Operational Emissions (pounds/day)

<u>Emission Source</u>	<u>Existing Conditions (2008)</u>					
	<u>VOC</u>	<u>NO_x</u>	<u>CO</u>	<u>SO_x</u>	<u>PM₁₀</u>	<u>PM_{2.5}</u>
<u>Motor Vehicles</u>	<u>8,465.06</u>	<u>14,597.82</u>	<u>100,895.01</u>	<u>63.15</u>	<u>10,968.44</u>	<u>2,152.10</u>
<u>Area Sources</u>	<u>11,478.34</u>	<u>1,521.53</u>	<u>46,295.37</u>	<u>143.53</u>	<u>7,400.75</u>	<u>7,123.59</u>
<u>Encina Power Plant¹</u>	<u>83.84</u>	<u>176.49</u>	<u>1,472.88</u>	<u>33.70</u>	<u>172.60</u>	<u>N/A</u>
<u>Total</u>	<u>20,027.24</u>	<u>16,295.84</u>	<u>148,663.26</u>	<u>240.38</u>	<u>18,541.79</u>	<u>9,275.69</u>

Source: Appendix B.

1. Source: California Energy Commission (CEC). 2012. Carlsbad Energy Center Project: Commission decision.

SUMMARY OF IMPACTS

The proposed General Plan may conflict with the San Diego County Regional Air Quality Strategy (RAQS) because it will allow development in excess of the growth projections on which the RAQS is based (Impact 3.2-1). Although this conflict may be eliminated by updating the growth projections in the next triennial update of the RAQS, it is considered a significant and unavoidable impact because updating the RAQS is within the jurisdiction and control of the SDAPCD, and the city cannot assure the timing and implementation of the proposed mitigation.

Implementation of the proposed General Plan could result in substantial air quality impacts (Impact 3.2-2). ~~These Air quality impacts anticipated under the proposed General Plan could~~ would occur due to future construction activities such as grading and excavation associated with development, and due to increased vehicular traffic and area sources associated with future growth within the city. As described below, the proposed General Plan includes goals and policies that would help to reduce potential air quality impacts through reductions in construction and operational emissions. In addition, mitigation measures are identified to further reduce construction and operational emissions. However, as described below, even with implementation

of the proposed General Plan goals and policies and the recommended mitigation measures, impacts due to emissions from short-term construction activities and long-term operation air quality impacts would remain significant and unavoidable.

Development allowed under the proposed General Plan would result in a cumulatively considerable net increase of criteria pollutants for which the region is nonattainment under an applicable federal or state ambient air quality standard (Impact 3.2-3). Although the goals and policies of the proposed General Plan and other recommended measures would reduce the net increase in emissions for which the SDAB is in nonattainment status, it is not possible at this time to state with certainty that these measures would result in no net increase in nonattainment pollutant emissions. Therefore, impacts would be considered significant and unavoidable.

The proposed General Plan may result in the exposure of sensitive receptors to substantial pollutant concentrations associated with new development constructed in proximity to SR-78 and I-5 (Impact 3.2-4). Although implementation of the goals and policies of the proposed General Plan and other recommended measures would reduce the exposure of sensitive receptors to substantial pollutant concentrations, impacts would be considered significant and unavoidable because it is not possible at this time to state with certainty that these measures would reduce exposure to substantial pollutant concentrations to a level below significance.

Development under the proposed General Plan will not create objectionable odors affecting a substantial number of people (Impact 3.2-5). Impacts associated with odors during construction and operations would be considered less than significant.

IMPACTS

Impact 3.2-1 Development under the proposed General Plan will not conflict with or obstruct the implementation of the applicable air quality plan. (~~Less than Significant~~ **Significant and Unavoidable)**

As mentioned earlier in this analysis, the SDAPCD and SANDAG are responsible for developing and implementing the clean air plan (RAQS) for attainment and maintenance of the NAAQS and CAAQS in the SDAB. The RAQS was initially adopted in 1991 and is updated on a triennial basis (most recently in 2009). The 2009 update to the RAQS remains the most up-to-date regional air quality plan for the SDAB. The RAQS is the primary document that accounts for regional emission levels in the SDAB and serves as the long-term guidance tool for bringing into attainment and maintaining adequate air emission levels in the region. The RAQS outlines the SDAPCD's plans and control measures designed to attain the state air quality standards, particularly for O₃ and its precursor pollutants. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in San Diego County and the cities in the county, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by San Diego County and the cities in the county as part of the development of their general plans.

If a project proposes development that is greater than that anticipated in the local general plan and SANDAG's growth projections, the project might be in conflict with the RAQS and may contribute to a potentially significant cumulative impact on air quality. Future land uses and development projects that occur consistent with the proposed General Plan would generate vehicle miles traveled (VMT) trips and area source emissions that would result in ozone precursor emissions and particulate matter. However, the overall premise of the proposed General Plan is to plan for future growth in Carlsbad, which would include the efficient reconfiguration of land uses to reduce vehicle trips and VMT including development of compact, mixed-use and transit-oriented development; increase non-motorized modes of travel; improve transit corridors; and implement long-term sustainable development measures city-wide. The numerous policies delineated in the proposed General Plan support these goals and objectives to reduce criteria pollutant emissions. Moreover, the Climate Action Plan (CAP) is proposed concurrent with the proposed General Plan; the CAP will further implement sustainability measures to reduce emissions resulting from motor vehicles, electricity, solid waste generation, and water use. Additionally, although the proposed General Plan would be designed to accommodate future growth, the proposed General Plan and CAP have been developed to effectively and sustainably accommodate growth while creating a more efficient, sustainable land use and transportation profile that would be consistent with the control measures and regional air quality planning strategies as outlined in the RAQS.

Moreover, individual projects under the proposed General Plan would be required to undergo subsequent, individual environmental review pursuant to CEQA, and as part of this review effort, projects requiring discretionary approval would be required to demonstrate compliance with the RAQS and SIP. Individual projects would also be required to demonstrate compliance with SDAPCD rules and regulations governing air quality, specifically particulate matter. The City of Carlsbad will continue to coordinate with the SDAPCD and SANDAG to ensure city wide growth projections, land use planning efforts, and local development patterns are accounted for in the regional planning and air quality planning processes. The proposed General Plan policies listed below would help to reduce potential impacts related to conflicts with an applicable air quality plan. For these reasons, and emission control measures established by the RAQS and SIP, the proposed General Plan would not conflict with or obstruct the implementation of the applicable air quality plan. Impacts would be less than significant.

While numerous measures would be taken under the proposed General Plan and CAP to support the goals and policies of the RAQS and SIP, population projections, as anticipated under the proposed General Plan, would not be consistent with the growth projections as assumed by SANDAG in 2009, the year the RAQS was last updated. Therefore, because future growth anticipated under the proposed General Plan would not be consistent with the underlying growth projections of the RAQS, the proposed General Plan would not be consistent with the applicable air quality plan for the region. Until the RAQS undergoes a future update to incorporate growth projections consistent with the proposed General Plan, impacts would be considered significant.

Proposed General Plan Policies that Reduce the Impact

Land Use and Community Design Element Policies

~~2-G.3 Promote infill development that makes efficient use of limited land supply, while ensuring compatibility and integration with existing uses. Ensure that infill properties develop with uses and development intensities supporting a cohesive development pattern.~~

~~2-G.6 Allow a range of mixed use centers in strategic locations that maximize access to commercial services from transit and residential areas.~~

~~2-G.7 Ensure that neighborhood serving shopping and mixed use centers include shopping as a pedestrian oriented focus for the surrounding neighborhood, are physically integrated with the surroundings, and contain neighborhood serving stores and small offices. Where appropriate, include in the centers high and medium density housing surrounding the retail core or integrated in mixed use buildings.~~

~~2-G.11 Provide industrial lands that can accommodate a wide range of pollution free industrial establishments, including those of relatively high intensity, research and development and related uses set in campus or park like settings, as well as moderate to low intensity establishments capable of being located adjacent to residential areas with minimal buffering and attenuation measures.~~

~~2-P.5 Work with SANDAG through participation in its various standing committees on regional plans and initiatives. Adopt local implementing policies and programs when found to be consistent with the General Plan and in the best interests of Carlsbad's residents and businesses.~~

~~2-P.13 Encourage medium to higher density residential uses located in close proximity to commercial services, employment opportunities and major transportation corridors.~~

~~2-P.29 Regulate industrial land uses on the basis of performance standards, including, but not limited to noise, air quality, odor, and glare.~~

~~2-P.43 Evaluate each discretionary application for development of property with regard to the following specific criteria [only applicable criteria listed below]:~~

~~g. Compliance with the performance standards of the Growth Management Plan.~~

~~h. Development proposals which are designed to provide safe, easy pedestrian and bicycle linkages to nearby transportation corridors.~~

Open Space, Conservation, and Recreation Element Policies

~~4-G.11 Protect air quality within the city and support efforts for enhanced regional air quality.~~

~~4-P.25 Locate new parks, plazas, or alternative parks (such as greenways) in existing infill neighborhoods—the Village and Barrio—where new residential development is contemplated.~~

~~4-P.51 Participate in the implementation of transportation demand management programs on a regional basis.~~

~~4-P.52 To the extent practical and feasible, maintain a system of air quality alerts (such as through the city website, internet, email to city employees, and other tools) based on San Diego Air Pollution Control District forecasts. Consider providing incentives to city employees to use alternative transportation modes during alert days.~~

~~4-P.53 Provide, whenever possible, incentives for carpooling, flex time, shortened work weeks, and telecommunications and other means of reducing vehicular miles traveled.~~

~~4-P.54 Cooperate with the ongoing efforts of the U.S. Environmental Protection Agency, the San Diego Air Pollution Control District, and the State of California Air Resources Board in improving air quality in the regional air basin.~~

~~4-P.55 Ensure that construction and grading projects minimize short term impacts to air quality.~~

~~a. Require grading projects to provide a storm water pollution prevention plan (SWPPP) in compliance with city requirements, which include standards for best management practices that control pollutants from dust generated by construction activities and those related to vehicle and equipment cleaning, fueling and maintenance;~~

~~b. Require grading projects to undertake measures to minimize mono nitrogen oxide (NOx) emissions from vehicle and equipment operations; and~~

~~e.a. Monitor all construction to ensure that proper steps are implemented.~~

Mitigation Measures

~~None required~~To ensure the proposed General Plan growth projections would be consistent with the underlying growth projections on which the 2009-RAQS is based, the following mitigation is proposed.

MM AQ-1: The city shall request that SDAPCD revise the RAQS to include the growth projections of the proposed General Plan in SDAPCD's next triennial update of the RAQS.

Significance After Mitigation

Although the city will recommend that SDAPCD can and should update the RAQS to include the proposed General Plan's growth projections, implementation of the proposed mitigation is within SDAPCD's jurisdiction and control and the city cannot guarantee the timing and implementation of the proposed mitigation. Therefore, impacts would be considered significant and unavoidable.

Impact 3.2-2 Development under the proposed General Plan would violate air quality standards or contribute substantially to an existing or projected air quality violation. (Significant and unavoidable)

As stated previously, in San Diego County, O₃ and particulate matter are the pollutants of main concern, since exceedances of CAAQS for those pollutants are experienced here in most years. For this reason, the SDAB has been designated as a nonattainment area for the state PM₁₀, PM_{2.5}, and O₃ (1-hour and 8-hour) standards. The SDAB is also a federal O₃ marginal nonattainment area for the 2008 8-hour NAAQS and a CO maintenance area.

Construction

~~Construction activities under the proposed General Plan would occur during future residential, commercial, industrial, and open space development. Specific project development schedules under the proposed General Plan are not known at this time; however, buildout would occur over an extended period of time, depending on unknown factors such as local economic conditions, market demand, and other financing considerations.~~

Future construction allowed under the proposed General Plan would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions.

Construction activities under the proposed General Plan would occur during future residential, commercial, industrial, and open space development. Specific project development schedules under the proposed General Plan are not known at this time; however, buildout would occur over an extended period of time, depending on unknown factors such as local economic conditions, market demand, and other financing considerations. As such, it is not possible to accurately estimate construction emissions at the plan level. To accurately quantify construction emissions requires project-level information including size and scale of the project to be constructed, construction schedule, equipment fleet, construction worker crew estimates, grading quantities, etc. This level of detail is not available at the program level, and the proposed General Plan, by nature, does not propose specific development projects. Subsequent project-level environmental review, including quantification of construction criteria pollutant emissions, would be required during the processing of individual applications for future projects. Therefore, such emission levels can only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts. Fugitive dust (PM₁₀ and PM_{2.5}) emissions would primarily result from grading and site preparation activities. NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles.

In an effort to quantify construction emissions, total proposed General Plan development was averaged over the 20-year buildout period, and a single construction year from this scenario was analyzed as a representative year of construction under the proposed General Plan. Emissions from construction were estimated through the use of the URBEMIS 2007, Version 9.2.4, land use and air emissions model (Jones & Stokes 2007). For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week (22 days per month), during project construction. Additionally, URBEMIS model assumptions for construction equipment were used in calculating construction emissions. The equipment mix is meant to represent a reasonably conservative estimate of construction activity.

Future development allowed under the proposed General Plan is subject to SDAPCD Rule 55 – Fugitive Dust Control. This rule requires that future projects the project take steps to restrict visible emissions of fugitive dust beyond their respective the property lines. Compliance with Rule 55 would limit any fugitive dust (PM₁₀ and PM_{2.5}) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least two times daily, resulting in an approximately 55% reduction of particulate matter. Future development allowed under the proposed General Plan is also subject to SDAPCD Rule 67.0 – Architectural Coatings. This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

Table 3.2-7, Construction Assumptions for General Plan Development Through 2035, shows the net increase in new development that would occur under the proposed General Plan. For the purposes of modeling, it was assumed that development under the proposed General Plan would occur over a 20-year period between 2015 and 2035, with an equal amount of construction occurring each year. To estimate construction emissions associated within ongoing demolition that would occur as part of redevelopment efforts under the proposed General Plan, a plan-wide average of 15% of existing development is assumed to be demolished over the buildout time period. Annual average development under these assumptions are presented in Table 3.2-8.

Table 3.2-8: Construction Assumptions for General Plan Development Through 2035

<u>Category</u>	<u>Assumption</u>
<u>Total New Development</u>	
<u>Housing Units</u>	<u>7,880 (394 units per year)</u>
<u>Commercial (sf)</u>	<u>2,132,200 (106,610 sf/year)</u>
<u>Office Space (sf)</u>	<u>778,500 (38,925 sf/year)</u>
<u>Industrial (sf)</u>	<u>4,600,400 (230,020 sf/year)</u>
<u>Hotel Rooms</u>	<u>2,360 (118 rooms/year)</u>
<u>Total Demolition</u>	<u>15% of existing development</u>

Source: Land uses and associated trip generation - Fehr and Peers 2013

Table 3.2-9 shows the estimated average maximum daily construction emissions associated with one year of development under the proposed General Plan.

Table 3.2-9: Estimated Annual Average Maximum Daily Construction Emissions (pounds/day)

<i>Emissions by Phase</i>	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>SO_x</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>
<u>Demolition</u>	<u>8.87</u>	<u>92.89</u>	<u>44.15</u>	<u>0.14</u>	<u>117.33</u>	<u>27.10</u>
<u>Grading</u>	<u>4.09</u>	<u>30.45</u>	<u>22.04</u>	<u>0.00</u>	<u>184.38</u>	<u>39.64</u>
<u>Trenching</u>	<u>1.41</u>	<u>10.38</u>	<u>8.52</u>	<u>0.00</u>	<u>0.47</u>	<u>0.43</u>
<u>Building Construction</u>	<u>5.06</u>	<u>30.34</u>	<u>71.45</u>	<u>0.11</u>	<u>2.09</u>	<u>1.61</u>
<u>Paving</u>	<u>4.17</u>	<u>15.53</u>	<u>10.87</u>	<u>0.01</u>	<u>1.17</u>	<u>1.05</u>
<u>Architectural Coating</u>	<u>217.70</u>	<u>0.10</u>	<u>1.95</u>	<u>0.00</u>	<u>0.02</u>	<u>0.01</u>
Maximum Daily Emissions¹	<u>222.76</u>	<u>92.89</u>	<u>73.40</u>	<u>0.14</u>	<u>184.38</u>	<u>39.64</u>
<u>Emission Threshold</u>	<u>137</u>	<u>250</u>	<u>550</u>	<u>250</u>	<u>100</u>	<u>55</u>
<u>Threshold Exceeded?</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Yes</u>	<u>No</u>

Source: Appendix B.

¹ *Maximum Daily Emissions including emissions of overlapping construction phases.*

For the purposes of modeling, it was assumed an equal amount of construction activity would occur each year; however, in some cases, greater amounts of construction activity would occur at any given time, and construction schedules for multiple projects may overlap resulting in greater emissions than those presented in Table 3.2-9. Similarly, over the course of the 20-year build-out period, some years may result in fewer construction activities and thus, fewer emissions; than that presented in Table 3.2-9.

Although specific project construction schedules, equipment fleets, construction phasing and development intensity of projects that would be implemented under the proposed General Plan are not known at this time, construction emissions generated during construction of future development would potentially exceed SDAPCD thresholds. As shown in Table 3.2-9, construction emissions would exceed the SDAPCD thresholds for VOC and PM₁₀; therefore, impacts would be considered potentially significant.

Proposed General Plan Policy 4-P.55, listed below, would further aid in reducing emissions associated with construction activities. For example, the policy requires compliance with the city's storm water pollution prevention plan (SWPPP) requirements, which include implementation of best management practices (BMPs) such as dust control measures and other construction-related measures during grading and construction activities that would reduce criteria pollutant emissions.¹⁹ Additionally, Section 4.504 of the city's California Green Building Standards Code (adopted by reference as part of the city's building code) includes measures related to pollutant control for dust debris and architectural coating that would reduce fugitive

¹⁹ City of Carlsbad. Construction SWPPP Standards and Requirements. June 2008. <http://www.carlsbadca.gov/civicax/filebank/blobdload.aspx?BlobID=24277> <http://www.carlsbadca.gov/business/building/Documents/EngStandsw-stds-vol4-ch3.pdf>.

dust and VOC content during coating applications for new projects.²⁰ ~~Measures outlined in the city's SWPPP process and Green Building Standards Code would~~ In addition, construction-related mitigation measures are available that can be implemented on a project-by-project basis, as needed to further reduce impacts associated with construction activities; ~~however, there is no guarantee emissions would be mitigated below SDAPCD thresholds. Therefore~~ Nonetheless, because the extent to which these mitigation measures will reduce project-level construction emissions cannot be accurately determined at this time, impacts would remain be considered significant and unavoidable during construction.

Operation

Following the completion of construction activities over the course of buildout of the proposed General Plan, operational activities would generate VOC, NO_x, CO, SO_x, PM₁₀, and PM_{2.5} emissions from mobile and stationary sources, including vehicular traffic, area sources (space heating, water heating, landscaping), and other larger stationary sources (the Encina Power Station (EPS) is the only existing and the replacement Carlsbad Energy Center Project (CECP) the only anticipated large stationary source in the city). ~~For the purposes of this analysis, the proposed General Plan buildout in year 2035 is compared to the baseline scenario (existing conditions) in order to determine the net operational emissions associated with the proposed General Plan.~~

The net new operational emissions generated by the proposed General Plan are estimated in Table 3.2-10. The net new operational emissions from motor vehicles, area sources and stationary sources were estimated for year 2035 based on the net change in criteria pollutant emissions between development of land uses without the proposed General Plan and development of land uses with the proposed General Plan. Under both of these scenarios, it is assumed that EPS would be decommissioned and the CECP would replace that stationary source. As a result, there is no net change in stationary source emissions as a result of the proposed General Plan. Stationary sources, other than area sources, were not included in operational emissions estimate calculations as new stationary source projects under the proposed General Plan are not proposed at this time. Additionally, should any future stationary sources be constructed, these projects would be subject to permitting review by the SDAPCD to ensure violations of current air quality standards would not occur, as well as independent environmental review under CEQA. Therefore, because future stationary source projects that would occur under the proposed General Plan would be required to obtain permits issued by the SDAPCD, and would be subject to independent environmental review, stationary source emissions other than the CECP are not provided.

The proposed General Plan would allow for future residential, commercial, office, hotel, and industrial development; and increases in land use densities and development intensities. ~~Operational~~ Similar to construction emissions, operational emissions were estimated using the URBEMIS 2007, Version 9.2.4, land use and air emissions model.²¹

²⁰ CBSC (California Building Standards Commission). 2010. California Green Building Standards Code (CalGreen). California Code of Regulations, Title 24, Part 11. June 2010.

²¹ Jones & Stokes Associates. *Software User's Guide: URBEMIS2007 for Windows; Emissions Estimation for Land Use Development Projects.*

Mobile Emissions

Implementation of the proposed General Plan would impact air quality through the vehicular traffic generated by future development. According to the project's traffic analysis prepared by Fehr and Peers, the net change in trips that can be attributed to buildout (2035) of the proposed General Plan is 225,746 trips.

The URBEMIS 2007 model was utilized to estimate daily emissions from proposed vehicular sources (refer to Appendix B). URBEMIS 2007 default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances, were conservatively used for the model inputs.

Proposed General Plan-related traffic was assumed to be comprised of a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2035 (full buildout) were used to estimate emissions associated with development under the proposed General Plan.

Area Sources

In addition to estimating mobile source emissions, the URBEMIS 2007 model was also used to estimate emissions from the proposed General Plan's area sources, which include other natural gas combustion, landscaping, and architectural coatings for maintenance. Refer to Appendix B for additional information.

Summary of Operational Emissions

~~Table 3.2-610, General Plan Buildout (2035) Estimated Daily Maximum Operational Emissions, presents shows the maximum daily emissions associated with the operation resulting net new operational emissions from buildout of the proposed General Plan at buildout (2035). The values shown in Table 3.2-10 for motor vehicles and area sources are the maximum summer or winter daily emissions results from URBEMIS 2007. Complete details of the emissions calculations are provided in Appendix B.~~

Table 3.2-610: General Plan Buildout (2035) Estimated Daily Maximum Operational Emissions (pounds/day)

<u>Emission Source</u>	<u>VOC</u>	<u>NO_x</u>	<u>CO</u>	<u>SO_x</u>	<u>PM₁₀</u>	<u>PM_{2.5}</u>
Estimated Emissions without Proposed General Plan (2035)						
<u>Motor Vehicles</u>	<u>2,219.98</u>	<u>2,663.21</u>	<u>23,268.40</u>	<u>63.13</u>	<u>10,884.72</u>	<u>2,077.60</u>
<u>Area Sources</u>	<u>11,478.33</u>	<u>1,521.53</u>	<u>46,295.37</u>	<u>143.53</u>	<u>7,400.75</u>	<u>7,123.59</u>
<u>Stationary Sources¹</u>	<u>110.14</u>	<u>395.12</u>	<u>1,190.68</u>	<u>30.68</u>	<u>213.70</u>	<u>N/A</u>
<u>Total</u>	<u>13,808.45</u>	<u>4,579.86</u>	<u>70,754.45</u>	<u>237.34</u>	<u>18,499.17</u>	<u>9,201.19</u>
Estimated Emissions with Proposed General Plan (2035)						
<u>Motor Vehicles</u>	<u>2,841.93</u>	<u>3,410.65</u>	<u>29,763.92</u>	<u>80.77</u>	<u>13,935.46</u>	<u>2,659.66</u>
<u>Area Sources</u>	<u>13,261.85</u>	<u>1,736.31</u>	<u>53,308.52</u>	<u>165.26</u>	<u>8,522.32</u>	<u>8,203.14</u>
<u>Stationary Sources¹</u>	<u>110.14</u>	<u>395.12</u>	<u>1,190.68</u>	<u>30.68</u>	<u>213.70</u>	<u>N/A</u>
<u>Total</u>	<u>16,213.92</u>	<u>5,542.08</u>	<u>84,263.12</u>	<u>276.71</u>	<u>22,671.48</u>	<u>10,862.80</u>
Net New Emissions at General Plan Buildout (2035)						
<u>Motor Vehicles</u>	<u>621.95</u> <u>622.27</u>	<u>747.844</u>	<u>6,495.52</u> <u>6,498.67</u>	<u>15.43</u> <u>17.64</u>	<u>3,050.74</u> <u>3,052.29</u>	<u>582.0633</u>
<u>Area Sources</u>	<u>1,783.52</u> <u>1,784.83</u>	<u>214.78</u> <u>212.35</u>	<u>7,013.15</u> <u>7,011.10</u>	<u>21.73</u>	<u>1,121.526</u>	<u>1,079.554</u>
<u>Stationary Sources¹</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>N/A</u>
<u>Total Net New Emissions</u>	<u>2,405.47</u> <u>2,407.10</u>	<u>962.22960-</u> <u>19</u>	<u>13,508.671-</u> <u>3,509.77</u>	<u>37.16</u> <u>39.37</u>	<u>4,172.314-</u> <u>173.85</u>	<u>1,661.618</u> <u>7</u>
<u>Emission Threshold</u>	<u>75</u>	<u>250</u>	<u>550</u>	<u>250</u>	<u>100</u>	<u>55</u>
<u>Threshold Exceeded?</u>	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>Yes</u>

Emissions represent maximum of summer and winter. "Summer" emissions are representative of the conditions that may occur during the ozone season (May 1 to October 31), and "winter" emissions are representative of the conditions that may occur during the balance of the year (November 1 to April 30).

Source: Appendix B.

1. Stationary sources include the upgrade of the Carlsbad Energy Center. Source: California Energy Commission (CEC). 2012. Carlsbad Energy Center Project: Commission Decision.

Operational emissions would exceed the SDAPCD's significance threshold for VOC, NO_x, CO, PM₁₀, and PM_{2.5} primarily due to motor vehicle emissions; therefore, impacts would be potentially significant. SO_x emissions would be below SDAPCD's significance thresholds. Measures outlined in the city's SWPPP and Green Building Standards Code would reduce impacts associated with operational emissions; however, there is no guarantee emissions would be mitigated below SDAPCD thresholds. Due to the substantial increase anticipated in average daily traffic (ADT) as a result of development under the proposed General Plan, no mitigation is available to reduce CO and PM₁₀ impacts from motor vehicles to a level that is less than significant. A number of proposed General Plan policies, listed below, as well as measures outlined in the city's SWPPP and Green

~~Building Standards Code, would reduce impacts associated with long-term operational criteria pollutant emissions; however, impacts would remain significant and unavoidable during operation. Due to the increase anticipated in average daily traffic (ADT) as a result of development under the proposed General Plan and growth in area source emissions, emissions of VOC, NO_x, CO, PM₁₀ and PM_{2.5} would exceed the SDAPCD's project-level, daily thresholds. Measures in the goals and policies of the proposed General Plan, the Climate Action Plan, the city's SWPPP requirements and Green Building Standards Code (listed below) would reduce impacts associated with construction and operational emissions. However, in the absence of specific information regarding the size, location, timing and other characteristics of future development allowed under the General Plan, it is not possible at this time to determine whether these measures would reduce project-level operational emissions below SDAPCD thresholds. Therefore, impacts due to increased emissions from future development would remain significant and unavoidable during operation.~~

Proposed General Plan Policies that Reduce the Impacts

~~Land Use and Community Design Element Goals 2-G.3, 2-G.6, 2-G.7, and 2-G.11, and policies 2-P.5, 2-P.13, 2-P.29, and 2-P.43, listed above, would help to reduce potential air quality impacts.~~

~~Open Space, Conservation, and Recreation Element~~

~~Goals 4-G.11 and policies 4-P.25, 4-P.51, 4-P.52, 4-P.53, 4-P.54, and 4-P.55 listed above, would help to reduce potential air quality impacts.~~

- 2-G.3 Promote infill development that makes efficient use of limited land supply, while ensuring compatibility and integration with existing uses. Ensure that infill properties develop with uses and development intensities supporting a cohesive development pattern.

- 2-G.6 Allow a range of mixed-use centers in strategic locations that maximize access to commercial services from transit and residential areas.

- 2-G.7 Ensure that neighborhood serving shopping and mixed-use centers include shopping as a pedestrian-oriented focus for the surrounding neighborhood, are physically integrated with the surroundings, and contain neighborhood-serving stores and small offices. Where appropriate, include in the centers high and medium density housing surrounding the retail core or integrated in mixed-use buildings.

- 2-G.11 Provide industrial lands that can accommodate a wide range of pollution-free industrial establishments, including those of relatively high intensity; research and development and related uses set in campus or park-like settings; as well as moderate to low intensity establishments capable of being located adjacent to residential areas with minimal buffering and attenuation measures.

- 2-P.5 Work with SANDAG through participation in its various standing committees on regional plans and initiatives. Adopt local implementing policies and programs when found to be consistent with the General Plan and in the best interests of Carlsbad's residents and businesses.

- 2-P.13 Encourage medium to higher density residential uses located in close proximity to commercial services, employment opportunities and major transportation corridors.
- 2-P.29 Regulate industrial land uses on the basis of performance standards, including, but not limited to noise, air quality, odor, and glare.
- 2-P.43 Evaluate each discretionary application for development of property with regard to the following specific criteria [only applicable criteria listed below]:
- g. Compliance with the performance standards of the Growth Management Plan.
 - h. Development proposals which are designed to provide safe, easy pedestrian and bicycle linkages to nearby transportation corridors.

Mobility Element Policies

- 3-P.1 Implement a comprehensive livable streets network. This network, as outlined in Table 3-1 and shown on Figure 3-1, prioritizes transportation modes by street typology and accessibility to users of the system.
- 3-P.3 Apply and update the city's multi-modal level of service (MMLOS) methodology and guidelines that reflect the core values of the Carlsbad Community Vision related to transportation and connectivity. Utilize the MMLOS methodology to evaluate impacts of individual development projects and amendments to the General Plan on the city's transportation system.
- 3-P.4 Implement the city's MMLOS methodology by evaluating level of service (LOS) for prioritized modes. Maintain LOS D or better only for the prioritized modes of travel by street typology as outlined in Table 3-1 and Figure 3-1.
- 3-P.6 Utilize transportation demand management strategies, non-automotive enhancements (bicycle, pedestrian, transit, train, trails, and connectivity), and traffic signal management techniques as long-term transportation solutions and traffic mitigation measures to carry out the Carlsbad Community Vision.
- 3-P.7 Develop and maintain a list of LOS exempt intersections and streets approved by the City Council. For LOS exempt intersections and streets, the city will not implement motor vehicle capacity improvements to maintain the LOS standard outlined in Policy 3-P.4 if such improvements are beyond what is identified as appropriate at build out of the General Plan; however, other non-vehicle capacity-building improvements may be required to improve mobility, to the extent feasible, and/or to implement the livable streets goals and policies of this Mobility Element. To be considered LOS exempt, an intersection or street must be identified as built-out by the City Council because:
- a. acquiring the rights of way is not feasible; or

- b. the proposed improvements would significantly impact the environment in an unacceptable way and mitigation would not contribute to the nine core values of the Carlsbad Community Vision; or
- c. the proposed improvements would result in unacceptable impacts to other community values or General Plan policies; or
- d. the proposed improvements would require more than three through travel lanes in each direction.

3-P.9 Require new development that adds traffic to LOS-exempt locations (consistent with 3-P.7) to implement transportation demand management strategies that reduce the reliance on the automobile and assist in achieving the city's livable streets vision.

3-P.10 Update the Citywide Facilities and Improvements Plan to ensure consistency with the General Plan. This includes updating the circulation LOS standards methodologies to reflect a more balanced/multi-modal approach.

3-P.11 Evaluate implementing a road diet to three lanes or fewer for existing four-lane streets currently carrying or projected to carry 25,000 average daily traffic volumes or less in order to promote biking, walking, safer street crossings, and attractive streetscapes.

3-P.12 Design new streets, and explore funding opportunities for existing streets, to minimize traffic volumes and/or speed, as appropriate, within residential neighborhoods without compromising connectivity for emergency first responders, bicycles, and pedestrians consistent with the city's Carlsbad Active Transportation Strategies. This should be accomplished through management and implementation of livable streets strategies and such programs like the Carlsbad Residential Traffic Management Plan.

3-P.13 Consider innovative design and program solutions to improve the mobility, efficiency, connectivity, and safety of the transportation system. Innovative design solutions include, but are not limited to, traffic calming devices, roundabouts, traffic circles, curb extensions, separated bicycle infrastructure, pedestrian scramble intersections, high visibility pedestrian treatments and infrastructure, and traffic signal coordination. Innovative program solutions include, but are not limited to, webpages with travel demand and traffic signal management information, car and bike share programs, active transportation campaigns, and intergenerational programs around schools to enhance safe routes to schools. Other innovative solutions include bicycle friendly business districts, electric and solar power energy transportation systems, intelligent transportation systems, semi- or full autonomous vehicles, trams, and shuttles.

3-P.18 Support pedestrian and bicycle facilities at all Interstate-5 and State Route 78 interchanges.

- 3-P.20 Update the pedestrian, trails and bicycle master plans, as necessary, to reflect changes in needs, opportunities and priorities.
- 3-P.24 Improve and enhance parking, connectivity, access, and utilization for pedestrians and bicycles to COASTER stations, utility corridors, and open spaces consistent with city planning documents.
- 3-P.25 Evaluate incorporating pedestrian and bicycle infrastructure within the city as part of any planning or engineering study, private development, or capital project where bicyclists or pedestrians are a prioritized or non-prioritized mode.
- 3-P.26 Complete the Carlsbad Active Transportation Strategies to assist in identifying livable street implementation parameters within the city.
- 3-P.28 Require developers to improve pedestrian and bicycle connectivity consistent with the city's bicycle and pedestrian master plans and trails master planning efforts. In addition, new residential developments should demonstrate that a safe route to school and transit is provided to nearby schools and transit stations within a half mile walking distance.
- 3-P.29 Work with existing neighborhoods and businesses to improve pedestrian and bicycle connectivity and safety consistent with the city's pedestrian and bicycle master plans and trails master planning efforts.
- 3-P.30 Actively pursue grant programs such as SANDAG's Active Transportation Grant Program and Smart Growth Incentive Program to improve non-automotive connectivity throughout the city. The emphasis of grant-funded projects shall be on implementation, which includes planning documents that guide and prioritize implementation, programs that encourage the use of active transportation modes, education for the use of active transportation modes, or physical improvements themselves.
- 3-P.31 Partner with other agencies and/or developers to improve transit connectivity within Carlsbad. As part of a comprehensive transportation demand management (TDM) strategy and/or with transit oriented development (TOD), a shuttle system could be established that connects destinations and employment centers like LEGOLAND, hotels, the Village, McClellan-Palomar Airport, business parks, the COASTER and Breeze transit stations, and key destinations along the coast. The system could incorporate shuttle service in adjacent cities to maximize connectivity.
- 3-P.32 Encourage NCTD, SANDAG and other transit providers to provide accessibility for all modes of travel to the McClellan-Palomar Airport area.
- 3-P.35 Require new employment development to provide secure bicycle parking on-site. Major employers should provide shower and changing rooms for employees as appropriate.

3-P.37 Consider supporting new development and existing businesses with various incentives (such as parking standards modifications) for implementing TDM programs that minimize the reliance on single-occupant automotive travel during peak commute hours.

Open Space, Conservation, and Recreation Element Policies

4-G.11 Protect air quality within the city and support efforts for enhanced regional air quality.

4-P.25 Locate new parks, plazas, or alternative parks (such as greenways) in existing infill neighborhoods – the Village and Barrio – where new residential development is contemplated.

4-P.51 Participate in the implementation of transportation demand management programs on a regional basis.

4-P.52 To the extent practical and feasible, maintain a system of air quality alerts (such as through the city website, internet, email to city employees, and other tools) based on San Diego Air Pollution Control District forecasts. Consider providing incentives to city employees to use alternative transportation modes during alert days.

4-P.53 Provide, whenever possible, incentives for carpooling, flex-time, shortened work weeks, and telecommunications and other means of reducing vehicular miles traveled.

4-P.54 Cooperate with the ongoing efforts of the U.S. Environmental Protection Agency, the San Diego Air Pollution Control District, and the State of California Air Resources Board in improving air quality in the regional air basin.

4-P.55 Ensure that construction and grading projects minimize short-term impacts to air quality.

a. Require grading projects to provide a storm water pollution prevention plan (SWPPP) in compliance with city requirements, which include standards for best management practices that control pollutants from dust generated by construction activities and those related to vehicle and equipment cleaning, fueling and maintenance;

b. Require grading projects to undertake measures to minimize mono-nitrogen oxide (NOx) emissions from vehicle and equipment operations; and

c. Monitor all construction to ensure that proper steps are implemented.

Climate Action Plan Goals and Actions that Reduce the Impacts

Measure K: Promote Transportation Demand Management Strategies

- Goal: Promote Transportation Demand Management Strategies with a goal of achieving a 10 percent increase in alternative mode use by workers in Carlsbad, for a total of 32 percent alternative mode use.
- Actions:
 - K-1: Adopt a citywide transportation demand management (TDM) plan, as described in the General Plan Mobility Element, detailing a mix of strategies to reduce travel demand, specifically of single occupancy vehicles. SANDAG’s 2012 “Integrating Transportation Demand Management Into the Planning and Development Process” provides a guide to designing and implementing a TDM plan and will be used as a reference document to develop the city’s TDM plan. TDM strategies evaluated in the plan include parking ordinances, subsidized or discounted transit programs, transit marketing and promotion, ~~carsharing~~car sharing, parking pricing, and bike parking. (Mid-term)
 - K-2: Adopt a TDM ordinance, defining a minimum trip generation threshold for nonresidential development projects. The city will set performance requirements for minimum alternative mode use based on project type. All projects above the threshold shall submit a TDM plan, which includes a description of how the minimum alternative mode use will be achieved and maintained over the life of the project. Potential TDM trip reduction measures can include carpool and vanpool ~~ridematching~~ride matching services; designated employees as contacts for trip reduction programs; providing a direct route to transit in coordination with NCTD; developing public-private transit partnerships; passenger loading zones; pedestrian connections; showers and clothes lockers; long-term bicycle parking and shuttle programs. (Mid-term)

Measure L: Promote an Increase in the Amount of Zero-Emissions Vehicle Travel

- Goal: Promote an increase in the amount of ZEV43 miles traveled from a projected 15 percent to 25 percent of total vehicle miles traveled by 2035.
- Actions:
 - L-1: Working with industry partners, construct a “PV to EV” pilot project to install a PV charging station at a city facility (such as the Faraday Center), to charge city ZEVs. The purpose of the pilot project would be to evaluate the feasibility of incorporating more ZEV into the city’s fleet. (Short-term)
 - L-2: Prepare a community-wide charging station siting plan, which evaluates site visibility and exposure, EV driving ranges, high volume destinations, locations with high ownership or interest in EVs, and cost of construction. (Short-term)

- L-3: Construct ZEV charging stations based on the community-wide charging station siting plan described in L-1 above. The ZEV charging stations will be funded by grant funds when available, and the city will post signage directing ZEVs to charging stations. (Mid-term)
- L-4: Offer dedicated ZEV parking, and provide charging stations adjacent to ZEV parking as identified in the community-wide charging station siting plan. (Mid-term)
- L-5: Adopt requirements for ZEV parking for new developments. (Mid-term)
- L-6: Adopt a residential energy conservation ordinance, similar to Palo Alto, requiring the installation of EV chargers or pre-wiring in new residential construction and major renovations. (Mid-term)
- L-7: Update the city's Fleet Management Program to include a low and zero-emissions vehicle replacement/purchasing policy. Increase the proportion of fleet low and zero-emissions vehicle miles traveled to 25 percent of all city-related VMT by 2035. (Mid-term)

Green Building Standards and Measures that Reduce the Impacts

Title 24 also includes Part 11, known as California's Green Building Standards (CALGreen). The most recent version of the CALGreen standards took effect in January 2014, and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings, as well as schools and hospitals. The mandatory standards require a 20% mandatory reduction in indoor water use as well as 50% of construction and demolition waste must be diverted from landfills. Nonresidential mandatory measures also include provision of bicycle parking and designated parking for low-emitting, fuel-efficient, and carpool/van pool vehicles that would reduce criteria air pollutant emissions due to decreased VMT.

Mandatory CalGreen Measures That Reduce Criteria Air Pollutant Emissions

Chapter 4: Residential Mandatory Measures

Division 4.5 – Environmental Quality

Section 4.503 Fire Places

- Any installed woodstove or pellet stove shall comply with U.S. EPA Phase II emission limits where applicable and any applicable local ordinances.

Section 4.54 Pollutant Control

- Adhesives, sealants, and caulks meet SCAQMD Rule 1168 for VOC limits and prohibition on the use of certain toxic compounds.
- Paints and coatings will comply with VOC limits specified by CARB Architectural Suggested Control Measure.
- Aerosol paints and coatings will meet MIR limits for ROCs and prohibitions on certain toxic compounds and ozone depleting substances.

- Actual limits for each of these are specified on page 28 of CalGreen.
- Carpets and flooring will meet low VOC and air quality standards from California Department of Public Health
- Composite wood products will meet CARB Air Toxics Control Measure for Composite Wood for formaldehyde emissions.

Chapter 5: Nonresidential Mandatory Measures

Division 5.1 – Planning and Design

Section 5.106 Site Development

- Projects with less than one acre of disturbance will implement BMPs to prevent loss of soil through wind and water erosion (reduced fugitive dust).

Division 5.4 – Material Conservation and Resource Efficiency

- Same measures as for residential in addition to the following:
 - Finish materials VOC limits
 - Refrigerant leak protections

SWPPP Air Quality Reduction Measures that Reduce the Impacts

City of Carlsbad Standard Urban Storm Water Management Plan (SUSMP) and Engineering Standards for Stormwater Best Management Practices

Construction SWPPP Standards and Requirements:

- Implementation of erosion control BMPs including hydroseeding, soil binders, geotextiles, mats, fiber rolls, etc.
- Implementation of tracking control BMPs including stabilized construction ingress/egress, stabilized construction roadway, and ingress/egress tire washing.
- Implementation of waste management and materials pollution control BMPs including material delivery and storage, and stockpile management (enclosing or covering stored materials).
- Compliance with all “Dry Season Site Management Requirements” as delineated in the Engineering Standards, Storm Water Standards Manual.
- Minimize site disturbance including sloped areas that are susceptible to wind and water erosion.
- Landscape design to reduce wind and water erosion including vegetation stabilization.

Mitigation Measures

~~No mitigation is available beyond measures identified in the city’s SWPPP, Green Building Standards Code, and the goals and policies in the General Plan that would reduce impacts to a level that is less than significant.~~

The goals and policies of the proposed General Plan, the Climate Action Plan, measures contained in the Green Building Code, the city's SWPPP requirements and applicable federal, state and local air quality regulations, provide a framework for developing project-level air quality protection measures for future development projects. The city's process for the evaluation of future development projects includes site-specific environmental review and documentation pursuant to CEQA, as well as an analysis of those projects for consistency with the goals, policies and recommendations of the proposed General Plan.

In addition to the measures identified in the goals and policies of the proposed General Plan, the Climate Action Plan, the city's SWPPP requirements and the Green Building Code described above, implementation of the mitigation measures identified below would avoid or reduce impacts resulting from the construction and operations emissions of future development allowed under the proposed General Plan. During project-level environmental review, if potential impacts are determined to be significant despite conformance with the measures described above, the mitigation measures provided below would be implemented as needed to reduce project-specific impacts to below SDAPCD thresholds. Mitigation measures may include, but would not be limited to, the following:

MM AQ-2: During the project-level environmental review of future development projects allowed under the proposed General Plan, the project applicant shall prepare an air quality technical report that analyzes all phases of project construction and operations. The technical report shall analyze construction and operational emissions and determine whether emissions would exceed SDAPCD thresholds. If a project's air quality technical report determines that construction or operations emissions exceed the SDAPCD threshold(s), site-specific mitigation measures shall be implemented to avoid or reduce emissions to SDAPCD thresholds. Where mitigation measures are required, the city will identify these measures in the project-level environmental document and include them in a mitigation monitoring and reporting program (MMRP) for the individual development project.

MM AQ-3: For projects that exceed daily construction emissions thresholds established by the SDAPCD, the following measures may be required as needed to reduce project-level impacts. These measures may be updated, expanded and refined when applied to specific future projects based on project-specific design and changes in existing conditions, and local, state and federal laws. Measures may include but are not limited to:

- A. Fugitive dust generated by grading and construction activities shall be minimized and retained on the project site by complying with SDAPCD Rule 55, as applicable, and the following dust control measures:
 - 1. Prevent dust from leaving the site during construction, clearing, grading, earthmoving, excavation, or transportation of cut or fill materials by applying water (with water trucks or sprinkler systems) to all active disturbed soil areas and all on-site areas of vehicle movement at least twice daily (later in the morning and after work is completed for the day) and whenever winds exceed 15 miles per hour.

2. Soil stockpiled for more than 2 days shall be covered, kept moist, or treated with soil binders to prevent dust generation.
3. Speeds on unpaved roads shall be reduced to less than 15 miles per hour.
4. All grading and excavation operations shall be halted when wind speeds exceed 25 miles per hour.
5. Prevent tracking and erosion of soil onto paved streets by utilizing any of the following or other equally effective measures, as determined necessary by the city: track-out grates or gravel beds at each egress point, wheel-washing at each egress, soil binders/stabilizers, geotextiles, mulching, seeding, sandbags, etc. Dirt and debris spilled onto paved surfaces at the project site and on the adjacent roadways shall be swept, vacuumed, and/or washed at the end of each workday.
6. The cargo of all trucks hauling dirt, sand, soil, or other loose material to and from the construction site shall be covered and/or a minimum 2 feet of freeboard shall be maintained.

B. The following measures may be required during project grading and construction to reduce emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) from construction equipment:

1. The engine size of construction equipment shall be the minimum size required for its intended use.
2. Construction equipment shall be maintained in tune per the manufacturer's specifications.
3. Catalytic converters shall be installed on gasoline-powered equipment over 50 horsepower.
4. Electric equipment or alternative fueled vehicles, such as compressed natural gas or liquefied natural gas, shall be utilized in lieu of diesel-powered equipment, where feasible.
5. Comply with SDAPCD's Rule 67 (Architectural Coatings).

MM AQ-4: For projects that exceed daily operational emissions thresholds established by the SDAPCD, the following measures may be required as needed to reduce project-level impacts. These measures may be updated, expanded and refined when applied to specific future projects based on project-specific design and changes in existing conditions, and local, state and federal laws. Measures may include but are not limited to:

- A. Implement CALGreen's voluntary Tier 1 or Tier 2 standards. Tier 1 standards call for a 15% improvement in energy requirements, more strict water conservation, 65%

diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, more strict water conservation, 75% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar reflective roofs.

- B. Include project features that encourage alternate transportation modes.
 - 1. For pedestrians: sidewalks; safe street and parking lot crossings; shade trees; off street breezeways, alleys, and over crossings; placement of parking lots and building entrances to favor pedestrians rather than cars; shower and locker facilities.
 - 2. For transit riders: all of the above plus safe, sheltered transit stops with convenient access to building entrances.
 - 3. For bicyclists: theft proof and well-lighted bicycle storage facilities with convenient access to building entrance; on-site bikeways between buildings or uses; shower and locker facilities.
 - 4. For carpools and vanpools: preferential parking.
- C. Use electric equipment for landscaping and property maintenance
- D. Plant shade trees in parking lots
- E. Install solar cooling/heating

MM AQ-5: To reduce ozone precursors, architectural coatings used for building maintenance shall comply with SDAPCD Rule 67 (Architectural Coatings).

MM AQ-6: If required, new stationary sources such as diesel generators shall obtain appropriate permits from the SDAPCD.

Additional health-related mitigation measures are provided under Impact 3.2-4.

Significance After Mitigation

~~Since no mitigation is available beyond the goals and policies provided in the General Plan to ensure that air quality impacts would be less than significant, impacts would remain significant and unavoidable.~~

Conformance with the goals and policies of the proposed General Plan, the Climate Action Plan, the city's SWPPP requirements, and the Green Building Standards Code (listed above), and implementation of the mitigation measures identified above would reduce impacts associated with operational emissions. However, in the absence of specific information regarding the size, location, timing and other characteristics of future development allowed under the proposed General Plan, it is not possible at this time to quantify that these measures would reduce project-

level operational emissions below SDAPCD thresholds. Therefore, impacts would be considered significant and unavoidable.

Impact 3.2-3 Development under the proposed General Plan will not result in a cumulatively considerable net increase of any criteria pollutant for which the General Plan region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for O₃ precursors). (Significant and Unavoidable~~Less than Significant~~)

In analyzing cumulative impacts from the proposed General Plan, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. ~~If the proposed General Plan does not exceed thresholds and is determined to have less than significant impacts, it may still would~~ contribute to a significant cumulative impact on air quality if the emissions from the proposed General Plan, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. ~~However, the proposed General Plan would only be considered to have a significant cumulative impact if its contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact).~~

The SDAB is currently in has been designated as a federal nonattainment area for criteria pollutant O₃ (VOC and NO_x are the precursors of O₃), and a state nonattainment area for criteria pollutants O₃, PM₁₀, and PM_{2.5} from past and present development.

Construction activities associated with future development under the proposed General Plan would result in the temporary generation of construction emissions. PM₁₀ and PM_{2.5} emissions associated with construction generally result in localized impacts; therefore, construction emissions could be considered cumulatively considerable if different construction projects within the same vicinity are occurring simultaneously and the emissions combine to exceed SDAPCD thresholds.

Table 3.2-9 shows that operational emissions from buildout of the proposed General Plan will result in a net increase of: 2,433.40 pounds per day of VOC; 1,178.82 pounds per day of NO_x; 4,214.95 pounds per day of PM₁₀; and 1,661.87 pounds per day of PM_{2.5}, all of which exceed SDAPCD project-level thresholds. Although numerous measures would be taken under the proposed General Plan and Climate Action Plan to reduce air quality impacts, buildout of the proposed General Plan would result in operational emissions of VOC, NO_x, PM₁₀ and PM_{2.5} that exceed SDAPCD project-level, daily thresholds. Therefore, the proposed General Plan would result in a cumulatively considerable net increase in VOC and NO_x (precursors of O₃), for which the SDAB is in nonattainment under state (CAAQS) and federal (NAAQS) ambient air quality standards, and for PM₁₀ and PM_{2.5}, for which the SDAB is in nonattainment under state (CAAQS) ambient air quality standards. The impacts would be considered significant and unavoidable.

~~The RAQS relies on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and by the county as part of the development of their general plans. As such, projects that propose development that is consistent with the growth anticipated by local~~

~~general plans would be consistent with the RAQS. As discussed previously in Impact 3.2-1, future development projects allowed under the proposed General Plan and associated land uses would generate VMT that would result in ozone precursor emissions and particulate matter. However, individual projects proposed under the proposed General Plan would be required to undergo subsequent environmental review pursuant to CEQA, and as part of this review effort, projects requiring discretionary approval would be required to demonstrate compliance with the RAQS and SIP. Individual projects would also be required to demonstrate compliance with SDAPCD rules and regulations governing air quality, specifically particulate matter. The City of Carlsbad will continue to coordinate with the SDAPCD and SANDAG to ensure city wide growth projections, land use planning efforts, and local development patterns are accounted for in the regional planning and air quality planning processes. For these reasons, and emission control measures established by the RAQS and SIP, the proposed General Plan would not conflict with or obstruct the implementation of the applicable air quality plan. Impacts would be less than significant and would not result in a cumulatively considerable impact.~~

Proposed General Plan Policies and Other Measures that Reduce the Impacts

The General Plan policies, Climate Action Plan provisions, SWPPP requirements, Green Building Standards Code provisions and mitigation measures MM AQ-2 through MM AQ-6 listed above for Impact 3.2-2 shall apply.

Land Use and Community Design Element Policies

~~Goals 2-G.3, 2-G.6, 2-G.7, and 2-G.11, and policies 2-P.5, 2-P.13, 2-P.29, and 2-P.43, listed above, would help to reduce potential air quality impacts.~~

Open Space, Conservation, and Recreation Element Policies

~~**Goals 4-G.11 and policies 4-P.25, 4-P.51, 4-P.52, 4-P.53, 4-P.54, and 4-P.55 listed above, would help to reduce potential air quality impacts.**~~

Mitigation Measures

~~None required. The mitigation measures listed above for Impact 3.2-2 shall apply.~~

Significance After Mitigation

Conformance with the goals and policies of the proposed General Plan, the Climate Action Plan, the city's SWPPP requirements, and the Green Building Standards Code listed above, and implementation of the mitigation measures identified above would reduce the proposed General Plan's net increase in emissions for which the SDAB is in nonattainment status. However, in the absence of specific information regarding the size, location, timing and other characteristics of future development allowed under the proposed General Plan, it is not possible at this time to quantify that these measures would result in no net increase in nonattainment pollutant emissions. Therefore, impacts would be considered significant and unavoidable.

Impact 3.2-4 Development under the proposed General Plan will not expose sensitive receptors to substantial pollutant concentrations. (~~Less than Significant~~Significant and Unavoidable)

Construction

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal governments as toxic air contaminants (TACs) or hazardous air pollutants (HAPs). State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and is aimed at HAPs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal HAPs, and is adopting appropriate control measures for sources of these TACs. As examples, TACs include acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and ~~diesel particulate matter~~DPM. Some of the TACs are groups of compounds that contain many individual substances (for example, copper compounds and polycyclic organic matter). The greatest potential for TAC emissions during construction would be ~~diesel particulate~~DPM emissions from heavy equipment operations and heavy-duty trucks and the associated health impacts to sensitive receptors. Sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. SDAPCD Rule 1210 indicates that an incremental cancer risk threshold of 10 in 1 million or greater warrants public notification.²² "Incremental Cancer Risk" is the likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 70-year lifetime will contract cancer quantified using standard risk-assessment methodology. The proposed General Plan construction activities would be dispersed intermittently over an approximately 22~~20~~-year period.

Off-road diesel construction equipment and heavy-duty diesel trucks (e.g., concrete trucks, building materials delivery trucks), which are sources of ~~diesel exhaust particulate matter~~DPM, are regulated under three airborne toxic control measures (ATCMs) adopted by CARB. The ATCM for diesel construction equipment specifies particulate matter emission standards for equipment fleets, which become increasingly stringent over time. Furthermore, most newly-purchased construction equipment introduced into construction fleets after 2013–2015, depending on the engine horsepower rating, will be equipped with high-efficiency diesel particulate filters. One of ATCMs for heavy-duty diesel trucks specifies that commercial trucks with a gross vehicle weight rating over 10,000 pounds are prohibited from idling for more than 5 minutes unless the engines are idling while queuing or involved in operational activities. In addition, starting in model year 2008, new heavy-duty trucks must be equipped with an automatic shutoff device to prevent excessive idling or meet stringent NO_x requirements. Lastly, fleets of diesel trucks with a gross vehicle weight rating greater than 14,000 pounds are subject to another

²² SDAPCD. *Rules and Regulations, Regulation XII, Toxic Air Contaminants, Rule 1210, Toxic Air Contaminant Public Health Risks – Public Notification and Risk Reduction*. Effective June 12, 1996.

ATCM. This ATCM requires truck fleet operators to replace older vehicles and/or equip them with diesel particulate filters, depending on the age of the truck. Thus, over the life of the project, the ~~diesel exhaust particulate matter~~ DPM emissions from off-road construction equipment and trucks will be controlled substantially. Accordingly, implementation of the proposed General Plan is not anticipated to result in a long-term exposure of sensitive receptors to substantial concentration of construction-related TACs. Impacts would be less than significant.

Operation

Stationary Sources

Following construction activities, stationary sources such as boilers, diesel generators, and dry cleaning establishments would result in TAC emissions. In San Diego County, SDAPCD Rule 1200 establishes acceptable risk levels and emission control requirements for new and modified stationary sources that may emit additional TACs. Some stationary sources would require permits from the SDAPCD under Rule 1200. Under Rule 1200, permits to operate may not be issued when emissions of TACs result in an incremental cancer risk greater than 1 in 1 million without application of T-BACT, or an incremental cancer risk greater than 10 in 1 million with application of T-BACT, or a health hazard index (chronic and acute) greater than 1. The human health risk analysis is based on the time, duration, and exposures expected. T-BACT will be determined on a case-by-case basis; however, examples of T-BACT include diesel particulate filters, catalytic converters, and selective catalytic reduction technology. In accordance with SDAPCD Rule 20, the SDAPCD cannot issue a permit if compliance with Rule 1200 (Toxic Air Contaminants—New Source Review) and all other applicable air quality rules and regulations is not demonstrated. The proposed General Plan does not propose any new stationary sources within the plan area that have not been previously operating within the area (the Encina Power Station/Carlsbad Energy Center Project is considered an existing stationary source, the emissions from which are calculated in Table 3.2-9). Accordingly, the incremental cancer risk, ~~at to~~ nearby sensitive receptors from new and modified stationary sources would be at acceptable levels, and the impact to sensitive receptors would be less than significant. Additionally, the proposed General Plan includes policies that would reduce impacts to sensitive receptors as listed below. Therefore, impacts would be less than significant.

Exposure to Toxic Air Contaminants from Roadways

TACs are also generated from mobile sources, such as diesel trucks. Ten TACs have been identified through ambient air quality data as posing the greatest health risks in California. Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders. The risk from DPM is by far the largest, representing about 70 percent of the known statewide cancer risk from outdoor air toxics. On a typical urban freeway, DPM also represents about 70 percent of the potential cancer risk from vehicle traffic. DPMs are also of special concern because health studies show an association between particulate matter and premature mortality in those with existing cardiovascular disease (CARB 2005). Therefore, health risk studies associated with freeway proximity are primarily concerned with DPM because it comprises most of the associated health risk.

In addition to the length of the exposure period, the location of potential emissions sources and exposed sensitive receptors are major factors in determining the health risk of diesel exhaust. In general, diesel exhaust has a greater potential to harm people when the source of emissions is closer to sensitive populations (CARB 2005). However, even though sensitive receptors are at an increased risk to diesel exhaust, exposure can adversely affect all members of the population. CARB recommends avoiding siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. In general, concentrations of pollutant emissions are typically higher near transportation corridors and decline as distance increases from the source. The distance from the roadway and truck traffic densities are key factors affecting the strength of the association with adverse health effects (CARB 2005). The association of traffic-related emissions with adverse health effects has been noted within 1,000 feet of transportation corridors and is strongest within 300 feet (Zhu et al. 2002). There is growing evidence that proximity to heavily traveled roadways increases the potential for adverse health effects such as child lung function and asthma, and increases medical visits (Brunekreef 1997, Lin et al. 2000, Venn et al. 2001, Kim 2004, and English et al. 1999).

Generally, cancer risk will drop off with distance from a ground level pollution source, such as a freeway. Freeways and busy traffic corridors are defined as having traffic volumes of over 100,000 vehicles per day in urban areas and 50,000 vehicles per day in rural areas (Education Code Section 17312). CARB studies show that air pollution levels can be significantly higher within 500 feet (150 meters) of freeways or busy traffic corridors and then diminish rapidly (CARB 2005). Actual concentrations of DPM will vary at a particular location depending on traffic volume, vehicle mix, prevailing winds, and other variables. A downwind distance of 328 feet (100 meters) will reduce cancer risk by over 60 percent. If the physical downwind distance is increased to 984 feet (300 meters), the relative concentration is reduced over 80 percent (SCAQMD 2005).

There are two freeways that traverse through Carlsbad. SR-78 presently carries an estimated 123,000-134,000 vehicles per day along the northern boundary of the city, about 6,300 of which are trucks. The I-5 freeway carries approximately 192,000-200,000 vehicles per day in a north-south direction through the city, about 9,000 of which are trucks. Under the proposed General Plan, new development, including residential and commercial uses, could be constructed within proximity of these freeways; therefore there is the potential to expose sensitive receptors to substantial pollutant concentrations.

Although the proposed General Plan has the potential to expose sensitive receptors to toxic air contaminants from roadways, neither the SDAPCD nor the State of California has identified a methodology to correlate an exposure to such contaminants with an increase in specific health risks. The inability to quantify any potential increase in health risks was noted recently in the Air Quality section of its Final EIR/EIS for the I-5 Coast Corridor Project, where CalTrans summarized the credible scientific evidence relevant to evaluation of the impacts of mobile source air toxics (MSATs). In its review, the I-5 Coast Corridor Project EIR/EIS noted that “the methodologies for forecasting health impacts ... are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives.” The EIR/EIS further concluded that “there are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of

factors such as low-dose extrapolation and translation of occupational exposure data to the general population”, and that “there is also a lack of consensus on an acceptable level of risk.”²³

Exposure to Substantial Concentrations of Criteria Pollutant Emissions

As shown in Table 3.2-10, the proposed General Plan will result in an increase in criteria pollutant emissions. The emissions reported in Table 3.2-10 are based on plan-wide emissions that would be generated across the entire geographic area of the city over the buildout period ending in 2035. Even in areas where these pollutants are potentially more concentrated, the location of the pollutants cannot be pinpointed at this time to determine specific, localized health impacts.

Moreover, air quality in the San Diego Air Basin is continually improving, and although the basin is currently nonattainment for state ozone and particulate matter, there are very few violations of the state standards on an annual basis, and background concentrations of these pollutants are generally low. Because of this, air quality in the San Diego air basin is increasingly improving at a consistent rate, and thus is expected to result in decreased health risks associated with pollutant emissions on a regional basis. Therefore, development under the proposed General Plan is not expected to expose sensitive receptors to substantial concentrations of criteria air pollutants.

The potential health risks associated with criteria air pollutants are identified above in the discussion of “Pollutants and Health Effects.” Although an increase in criteria pollutant emissions could potentially result in increased human susceptibility to asthma and other respiratory conditions, neither the SDAPCD nor the State of California has identified a methodology for identifying a correlation between increased pollutant emissions and the number or type of health-related incidents that may occur on a plan-wide basis. To effectively measure impacts to human health from pollutant sources that may impact sensitive receptors, a site-specific health risk assessment or similar study would be required. Health risk assessments are based on project-level information such as: the location of existing sensitive receptors (e.g. existing hospitals, schools, elderly care facilities, etc.) in proximity to potential future emission sources; locating new sensitive receptors in the vicinity of existing pollution sources; the distance between the sources of toxic air contaminants (TACs) and the sensitive receptor; the location and exhaust parameters of stationary sources (e.g., stack height, temperature, flow rate, etc.); and pollutant source type.

Individual projects proposed under the proposed General Plan would be subject to individual environmental review under CEQA, and a health risk assessment, if warranted, would be conducted at the project level.

To further address effects to sensitive receptors and human health, mitigation is provided as described below and would be implemented where applicable on a project-by-project basis.

²³ California Department of Transportation, “Final Environmental Impact Report/Environmental Impact Statement and Section 4(f) Evaluation”, 2013; p. 3.14-27. http://www.dot.ca.gov/dist11/Env_docs/I-5NCC/Final/i-5_part3_chp3.pdf#page=309

Proposed Plan Policies that Reduce the Impacts

Land Use and Community Design Element Policies

See Goal 2-G.11 and Policy 2-P.29 above.

Open Space, Conservation and Recreation Element Policies

See Goal 4 G.11 and Policy 4 P.52 above.

See General Plan policies above.

Mitigation Measures

None required. Mitigation measures MMAQ-2 through MMAQ-6 above would reduce the exposure of sensitive receptors to substantial pollutant concentrations and thereby reduce potential adverse health effects associated with these pollutants. If a future development proposal would expose sensitive receptors to substantial pollutant concentrations even after implementation of mitigation measures MM AQ-2 through MM AQ-6, the following mitigation measure would be implemented during project-level environmental review to further reduce exposure of sensitive receptors to substantial pollutant concentrations:

MM AQ-7: The project applicant shall prepare a site-specific health risk assessment based on project-level information such as: the location of existing sensitive receptors (e.g. existing hospitals, schools, elderly care facilities, etc.) in proximity to potential future emission sources; locating new sensitive receptors in the vicinity of existing pollution sources; the distance between the sources of toxic air contaminants (TACs) and the sensitive receptor; the location and exhaust parameters of stationary sources (e.g., stack height, temperature, flow rate, etc.); and pollutant source type. The health risk assessment would identify appropriate measures necessary to reduce the exposure of sensitive receptors to substantial concentrations of pollutants and the impacts to human health to below a level of significance. These measures may include, but not be limited to, the installation of an air filtration system or the installation of vegetative landscaping at the sensitive receptor location.

Significance After Mitigation

Conformance with the goals and policies of the proposed General Plan, the Climate Action Plan, the city's SWPPP requirements and Green Building Standards Code provisions, and implementation of the mitigation measures identified above, would reduce the exposure of sensitive receptors to substantial pollutant concentrations. However, in the absence of the site-specific information required to perform a health risk assessment, it is not possible at this time to quantify that these measures would reduce exposure to substantial pollutant concentrations to a level below significance. Therefore, impacts would be considered significant and unavoidable.

None required.

Impact 3.2-5 Development under the proposed General Plan will not create objectionable odors affecting a substantial number of people. (Less than Significant)

Odors would be generated from vehicles and/or equipment exhaust emissions during construction of future projects under the proposed General Plan. Odors produced during

construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment and architectural coatings. Such odors are temporary and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be considered less than significant.

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. Development under the proposed General Plan would be required to meet all local, state, and federal regulations related to odor control, including permit requirements. However, sensitive receptors would be potentially located near odor-generating land uses, including potential future residential development located adjacent to, and within the vicinity of, the existing Encina Water Pollution Control Facility located south of Palomar Airport Road off of Avenida Encinas. Future project-level analysis will demonstrate consistency with the General Plan and policies as listed below would ensure that odor impacts would be reduced to a level that is less than significant.

Proposed Plan Policies that Reduce the Impacts

Land Use and Community Design Element Policies

See Policy 2-P.29 above.

Mitigation Measures

None required.

Recirculated Portions of the Draft Program
-Environmental Impact Report for the Carlsbad General Plan Update
Chapter 3.2: Air Quality

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