4.2 AIR QUALITY

4.2.1 INTRODUCTION

This section describes the projects impacts on air quality and contribution to regional air quality conditions, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the SDSU New Student Housing Project (project). Information used throughout this chapter is primarily based on the Air Quality and Greenhouse Gases Technical Report for the proposed project, prepared by Dudek, and is included as **Appendix C** to this EIR.

4.2.2 METHODOLOGY

Information contained in this section is based on the Air Quality and Greenhouse Gas Technical Report prepared for the proposed project. The data used in the technical report was gathered from SDSU; default assumptions within the California Emissions Estimator Model (CalEEMod), Version 2016.3.1; and best engineering judgment.

4.2.3 EXISTING CONDITIONS

4.2.3.1 ENVIRONMENTAL SETTING

Climate and Topography

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 (WRCC 2016).

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, it 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, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

San Diego Air Basin Climatology

The project area 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 (O_3) and a state nonattainment area for particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and O_3.

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. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce O_3, which contributes to the formation of smog. Smog is a combination of smoke and other particulates, O_3, hydrocarbons, oxides of nitrogen (NO_x) and other chemically reactive compounds which, under certain conditions of weather and sunlight, may result in a murky brown haze that causes adverse health effects (CARB 2014a).

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 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 (NO_2) 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 O_3 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 O_3 are transported.

Sensitive Receptors

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. 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 include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, athletic fields, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The project would be located within 25 feet of the existing Chapultepec Hall (a student residence hall), which would be the closest sensitive receptor. The Hardy Elementary School is located about 800 feet south of the project.

4.2.3.2 POLLUTANTS AND EFFECTS

Criteria Air Pollutants

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: O_3, NO_2, CO, sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead (Pb). These pollutants are discussed in the following paragraphs.[1] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a colorless gas that is formed in the atmosphere when volatile organic compounds (VOCs), sometimes referred to as reactive organic gases, and NO_x react in the presence of ultraviolet sunlight. O_3 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 O_3, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in O_3 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 O_3 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 NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_x and are major contributors to O_3 formation. High concentrations of NO_2 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 NO_2 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 the project area, 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

---

1 The following descriptions of health effects for each of the criteria air pollutants associated with project construction and operations are based on the U.S. Environmental Protection Agency's "Six Common Air Pollutants" (EPA 2012) and the California Air Resources Board's "Glossary of Air Pollutant Terms" (CARB 2014a) published information.

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. SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 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 PM_{10} 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 PM_{10}, is about 1/7 the thickness of a human hair. Major sources of PM_{10} 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 PM_{10} 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 PM_{10} 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 Pb, 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 PM_{10} 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.

Non-Criteria Pollutants

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 non-cancer 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 non-carcinogenic effects. Non-carcinogenic 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.

Diesel Particulate Matter. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. CARB classified "particulate emissions from diesel-fueled engines" (DPM; 17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars, and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000).

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

4.2.3.3 LOCAL AIR QUALITY

SDAB Attainment Designation

An area is designated in attainment when it is in compliance with the NAAQS and/or CAAQS. 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. The criteria pollutants of primary concern that are considered in this analysis are O_3, NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. Although there are no ambient standards for VOCs or NO_x, they are important as precursors to O_3.

The portion of the SDAB where the project site is located is designated by the EPA as an attainment area for the 1997 8-hour NAAQS for O_3 and as a marginal nonattainment area for the 2008 8-hour NAAQS for O_3.The SDAB is designated in attainment for all other criteria pollutants under the NAAQS with the exception of PM_{10}, which was determined to be unclassifiable. The SDAB is currently designated nonattainment for O_3 and particulate matter, PM_{10} and $PM_{2.5}$, under the CAAQS. It is designated attainment for the CAAQS for CO, NO_2, SO_2, lead, and sulfates.

Table 4.2-1, SDAB Attainment Classification, summarizes the SDAB's federal and state attainment designations for each of the criteria pollutants.

Table 4.2.-1
SDAB Attainment Classification

Pollutant	Federal Designation[a]	State Designation[b]
O_3 (1-hour)	Attainment (Maintenance)[1]	Nonattainment
O_3 (8-hour – 1997) (8-hour – 2008)	Attainment (Maintenance) Nonattainment (Moderate)	Nonattainment
CO	Unclassifiable/Attainment[2]	Attainment
PM_{10}	Unclassifiable/Attainment	Nonattainment
$PM_{2.5}$	Unclassifiable/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

Sources: [a] EPA 2014; [b] CARB 2016b.

1 The federal 1-hour standard of 0.12 parts per million (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, while the eastern portion is designated unclassifiable/attainment.

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. The Beardsley Street monitoring station represents the closest monitoring station to the project for concentrations for all pollutants except SO_2. The Redwood Avenue and Floyd Smith Drive monitoring stations for were used for SO_2. Ambient concentrations of pollutants from 2013 through 2015 are presented in **Table 4.2-2, Ambient Air Quality Data.** The number of days exceeding the ozone, PM_{10}, and $PM_{2.5}$ AAQS is shown in **Table 4.2-3, Frequency of Air Quality Standard Violations**; no AAQS exceedances for other pollutants were reported during the monitoring period. The state 8-hour O_3 standard was exceeded in 2013 and 2014, and the state 1-hour O_3 standard was exceeded in 2014, while the federal 8-hour O_3 standard was exceeded in 2014. Air quality within the project region was in compliance with both CAAQS and NAAQS for NO_2, CO, PM_{10}, $PM_{2.5}$, and SO_2 during this monitoring period.

Table 4.2-2
Ambient Air Quality Data

Pollutant	Averaging Time	2013	2104	2015	Most Stringent Ambient Air Quality Standard	Monitoring Station
O_3	8-hour	0.053 ppm	0.072 ppm	0.067 ppm	0.070 ppm	Beardsley Street
	1-hour	0.063 ppm	0.093 ppm	0.089 ppm	0.090 ppm	
PM_{10}	Annual	25.4 μg/m³	23.8 μg/m³	23.2 μg/m³	20 μg/m³	Beardsley Street
	24-hour	92.0 μg/m³	41.0 μg/m³	54.0 μg/m³	50 μg/m³	
$PM_{2.5}$	Annual	10.4 μg/m³	10.2 μg/m³	10.2 μg/m³	12 μg/m³	Beardsley Street
	24-hour	37.4 μg/m³	36.7 μg/m³	33.4 μg/m³	35 μg/m³	
NO_2	Annual	0.014 ppm	0.013 ppm	0.014 ppm	0.030 ppm	Beardsley Street
	1-hour	0.072 ppm	0.075 ppm	0.062 ppm	0.180 ppm	
CO	8-hour*	2.10 ppm	1.90 ppm	1.90 ppm	9.0 ppm	Beardsley Street
	1-hour*	3.0 ppm	2.7 ppm	2.6 ppm	20 ppm	
SO_2	Annual*	0.00014 ppm	0.00014 ppm	0.00011 ppm	0.030 ppm	Redwood Avenue (2013-2014) Floyd Smith Drive (2015)
	24-hour*	0.0006 ppm	0.0003 ppm	0.0004 ppm	0.040 ppm	

ppm = parts per million; μg/m³ = micrograms per cubic meter

Sources: CARB 2016c; EPA 2016.

Data represent maximum values.

* Data were taken from EPA 2016.

Table 4.2-3
Frequency of Air Quality Standard Violations

Monitoring Site	Year	Number of Days Exceeding Standard			
		National 24-Hour PM_{10}	*National 24-Hour $PM_{2.5}$*	*State 8-Hour O_3*	*National 8-Hour O_3*
Beardsley Street	2013	1	1	0	0
	2014	0	1	2	1
	2015	1	0	0	0

Source: CARB 2016c.

4.2.4 RELEVANT PLANS, POLICIES, AND ORDINANCES

4.2.4.1 FEDERAL

Clean Air Act

Criteria Pollutants

The federal Clean Air Act (CAA), passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the CAA, including the setting of National Ambient Air Quality Standards (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 O_3 protection, and enforcement provisions.

NAAQS are established by the EPA for "criteria pollutants" under the CAA, which are O_3, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb).

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The CAA 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.

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. Hazardous air pollutants include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for hazardous air pollutants, 189 substances and chemical families were identified as hazardous air pollutants.

Hazardous Air Pollutants

The 1977 federal Clean Air Act Amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants (NESHAPs) to protect public health and welfare.

Hazardous air pollutants include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for hazardous air pollutants, 189 substances and chemical families were identified as hazardous air pollutants.

4.2.4.2 STATE

California Clean Air Act

The California Clean Air Act was adopted in 1988 and establishes the state's air quality goals, planning mechanisms, regulatory strategies, and standards of progress. Under the California Clean Air Act, the task of air quality management and regulation has been legislatively granted to the California Air Resources Board (CARB), with subsidiary responsibilities assigned to air quality management districts (AQMDs) and air pollution control districts (APCDs) at the regional and county levels. CARB is responsible for ensuring implementation of the California Clean Air Act, responding to the federal CAA, and regulating emissions from motor vehicles and consumer products. Pursuant to the authority granted to it, CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS.

The NAAQS and CAAQS are presented in **Table 4.2-4, Ambient Air Quality Standards.**

Table 4.2-4
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primaryc[d]*	*Secondary[c,e]*
O_3	1 hour	0.09 ppm (180 μg/m^3)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)[f]	
NO_2[g]	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)	
CO	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m^3)
	24 hours	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m^3	150 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m^3	—	

Table 4.2-4
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primaryc[d]*	*Secondary[c,e]*
$PM_{2.5}$[i]	24 hours	—	35 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m³	12.0 μg/m³	15.0 μg/m³
Lead[j, k]	30-day Average	1.5 μg/m³	—	—
	Calendar Quarter	—	1.5 μg/m³ (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m³	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m³)	—	—
Vinyl chloridej	24 hours	0.01 ppm (26 μg/m³)	—	—
Sulfates	24- hours	25 μg/m³	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016b.

Notes: μg/m³ = micrograms per cubic meter; CO = carbon monoxide; mg/m³= milligrams per cubic meter; NO_2 = nitrogen dioxide; O_3 = ozone; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ppm = parts per million by volume; SO_2 = sulfur dioxide

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

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than 1. 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.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

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

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

[f] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[g] To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of 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.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour 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 SO_2 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 of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ 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.

Air Toxics Program

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The California Toxic Air Contaminants (TAC) list identifies more than 700 pollutants, of which carcinogenic and non-carcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) hazardous air pollutants. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the

On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel powered equipment. Several Airborne Toxic Control Measures that reduce diesel emissions including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

4.2.4.3 LOCAL

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. The project site is located within the SDAB and is subject to the guidelines and regulations of the SDAPCD.

In San Diego County, O_3 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 PM_{10}, $PM_{2.5}$, and O_3 standards. The SDAB is also a federal O_3 attainment (maintenance) area for 1997 8-hour O_3 standard, a O_3 nonattainment area for the 2008 8-hour O_3 standard, and a CO maintenance area (western and central part of the SDAB only). The project area is in the 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 County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis, most recently in 2016 (SDAPCD 2016a). The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, and information regarding projected growth in the cities and San Diego County, to project future emissions and determine 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 the cities and San Diego 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 projects would allow the region to reach attainment of the federal 1997 8-hour O_3 standard by 2009 (SDAPCD 2007). In this plan, SDAPCD relies on the RAQS to demonstrate how the region will comply with the federal O_3 standard. The RAQS details how the region will manage and reduce O_3 precursors (oxides of nitrogen (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 projects for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS. According to the Redesignation Request and Maintenance Plan for the 1997 National Ozone Standard for San Diego County, the SDAB did not reach attainment of the federal 1997 standard until 2011 (SDAPCD 2012). This plan, however, demonstrates the region's attainment of the 1997 O_3 NAAQS and outlines the plan for maintaining attainment status.

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 PM_{10} and $PM_{2.5}$) (SDAPCD 2005). In the report, SDAPCD evaluated the implementation of source-control measures that would reduce particulate matter emissions associated with residential wood combustion; various construction activities including earthmoving, demolition, and grading; bulk material storage and handling; carryout and trackout removal and cleanup methods; inactive disturbed land; disturbed open areas; unpaved parking lots/staging areas; unpaved roads; and windblown dust.

As stated earlier, the SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD:

- **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 have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1969).

- **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 (SDAPCD 2009b).
- **SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: 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 (SDAPCD 2015a).

City of San Diego

City of San Diego land use plans, policies and guidelines are not applicable to CSU/SDSU as a state entity. However, these local plans are provided for information and public disclosure purposes only. The San Diego Municipal Code addresses air quality and odor impacts at Chapter 14, Article 2, Division 7 paragraph 142.0710, "Air Contaminant Regulations" which states: Air contaminants including smoke, charred paper, dust, soot, grime, carbon, noxious acids, toxic fumes, gases, odors, and particulate matter, or any emissions that endanger human health, cause damage to vegetation or property, or cause soiling shall not be permitted to emanate beyond the boundaries of the premises upon which the use emitting the contaminants is located (City of San Diego 2000).

San Diego State University

The SDSU campus encompasses a wide variety of efforts to steward the University's resources and reduce their environmental impact. Sustainability includes areas such as climate action, energy, water, waste reduction, transportation, food, green buildings, social responsibility, and academics. The campus has undertook plant optimization of the cogeneration facility, installation of several solar photovoltaic systems, and implemented energy retro-fits around campus. The SDSU has signed the Carbon Commitment to achieve carbon neutrality in addition to developing a climate action plan. The campus has a trolley station and bus operation to provide a convenient and responsible way to commute around campus. There is also an extensive bike path network and Zipcar access for people to borrow a car as needed. The campus is committed to building green and has six buildings with the Leadership in Energy and Excellence in Environmental Design (LEED) accreditation. SDSU also has committed academically to prepare students as sustainable stewards with both major and minor programs.

4.2.5 THRESHOLDS OF SIGNIFICANCE

The significance criteria used to evaluate the project impacts to air quality are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact related to air quality would occur if the project would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable new 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 threshold emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

4.2.5.1 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 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 4.2-5, SDAPCD Air Quality Significance Thresholds,** are exceeded.

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would or would not result in a significant impact to air quality.

Table 4.2-5
SDAPCD Air Quality Significance Thresholds

Construction Emissions	
Pollutant	*Total Emissions (pounds per day)*
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			
	Total Emissions		
Pollutant	*Pounds per Hour*	*Pounds per Day*	*Tons per Year*
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
Operational Emissions			
Carbon monoxide (CO)	100	550	100
Lead and lead compounds	—	3.2	0.6
Volatile organic compounds (VOC)	—	137*	13.7
Toxic Air Contaminant (TAC) Thresholds			
TACs[a]	Maximum Incremental Cancer Risk ≥ 1.0		

Sources: City of San Diego 2016; SDAPCD 2016b; SDAPCD 2015b.

* 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 O_3.

[a] TACs include carcinogens and noncarcinogens.

The thresholds listed in **Table 4.2-5** represent screening-level thresholds that can be used to evaluate whether project-related emissions would 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 non-attainment pollutants, if emissions exceed the thresholds shown in **Table 4.2-5**, 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 (SDAPCD 1976). 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.

4.2.5.2 CITY OF SAN DIEGO

To determine the significance of the project's emissions on the environment, the City's *Significance Determination Thresholds* (City of San Diego 2016) were used. The City's thresholds are consistent with the thresholds contained in Appendix G of CEQA Guidelines, with the addition of the following threshold:

- Release substantial quantities of air contaminants beyond the boundaries of the premises upon which the stationary source emitting the contaminants is located.[2]

The potential for the project to release substantial quantities of air contaminants under the aforementioned threshold is addressed in the analysis of the project-generated criteria air pollutant emissions, toxic air contaminant emissions, and odors, as appropriate, in **Section 4.2.4, Impacts Analysis**.

The SDAPCD Air Quality Significance Thresholds shown in **Table 4.2-5** were used to determine significance of project-generated construction and operational criteria air pollutants; specifically, the project's potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation (as assessed under the threshold criterion 2). In regards to the analysis of potential impacts to sensitive receptors, the City specifically recommends consideration of sensitive receptors in locations such as day care centers, schools, retirement homes, and hospitals, or medical patients in residential homes close to major roadways or stationary sources, which could be impacted by air pollutants. The City of San Diego also states that the significance of potential odor impacts should be

---

[2] San Diego Municipal Code, Chapter 14, Article 2, Division 7, Off-Site Development Impact Regulations paragraph 142.0710 Air Contaminant Regulations, which states: "Air contaminants including smoke, charred paper, dust, soot, grime, carbon, noxious acids, toxic fumes, gases, odors, and particulate matter, or any emissions that endanger human health, cause damage to vegetation or property, or cause soiling shall not be permitted to emanate beyond the boundaries of the premises upon which the use emitting the contaminants is located." (Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

determined based on what is known about the quantity of the odor compound(s) that would result from the project's proposed use(s), the types of neighboring uses potentially affected, the distance(s) between the project's point source(s) and the neighboring uses such as sensitive receptors, and the resultant concentration(s) at the receptors.

The air quality section of the Significance Determination Thresholds recognizes attainment status designations for the SDAB and its nonattainment status for both ozone and particulate matter. As such, the document recognizes that all new projects should include measures, pursuant to CEQA, to reduce project-related ozone and particulate matter emissions to ensure new development does not contribute to San Diego's nonattainment status for these pollutants.

4.2.6 IMPACTS ANALYSIS

Following issuance of the Notice of Preparation (NOP) for the proposed projects, CSU/SDSU received comment letters from public and private entities related to air quality. These comment letters were concerning an increase in pollution as a result of the proposed project, as well as, compliance with both the County and City of San Diego Climate Action Plans. The analysis presented below addresses each of these topics.

Would the project conflict with or obstruct implementation of the applicable air quality plan?

As stated in **Section 4.2.2,** the SDAPCD and SANDAG are responsible for developing and implementing the clean air plans for attainment and maintenance of the AAQS in the SDAB; specifically, the SIP and RAQS.[3] The federal O_3 maintenance plan, which is part of the SIP, was adopted in 2012. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the SDAB based on the NAAQS. The 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 O_3. The SIP and RAQS rely 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 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,

---

3 For the purpose of this discussion, the relevant federal air quality plan is the ozone maintenance plan (SDAPCD 2012). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the SDAB.

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 would entail development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality. The proposed project site is within two different residential zones. The western portion of the project site is within the RS-1-7 zone (residential single unit), which allows for a minimum of one dwelling unit per 5,000 square feet. The eastern portion of the project site is within the RM-4-10 zone (high-density multiple dwelling units), which allows for a maximum density of one dwelling unit per 400 square feet of lot area (San Diego Municipal Code Section 131.0403 and Section 131.0406; City of San Diego 2017). Because the proposed project would develop student housing within an area designated as RS-1-7, the proposed use would not be consistent with the permitted uses of the City of San Diego Land Development Code. However, this would not result in a significant impact within the meaning of CEQA because as a state entity, SDSU is not subject to the City of San Diego Land Development Code.

Implementation of the project would result in an increase in 2,566 student housing beds. The City of San Diego's housing is projected to grow from 515,426 in 2010, to 559,197 in 2020, 640,194 in 2035, and 691,629 in 2050 (SANDAG 2013). The SANDAG projections assume an annual increase of 4,377 units between 2010 and 2020, 5,400 units between 2020 and 2035, and 3,429 units between 2035 and 2050. The projects operation will be phased, with Phase I becoming operational in 2019 with 850 student housing beds, Phase II in 2022 with 850 student housing beds, and Phase III in 2025 with 866 student housing beds. The additional 850 units expected with Phase I is within the projected annual increase of 4,377 housing units per year. Similarly, the addition of 850 units in 2022 and 866 units in 2025 is within the SANDAG annual projections of 5,400 and 3,429 housing units per year, respectively. In addition, and of relevance, the proposed project is not expected to create an increase in student enrollments or local population. The project will allow students who are currently living off campus to live on campus. Therefore, the proposed project would be consistent with the SANDAG projections.

The anticipated increase in the local housing of 2,566 beds and associated vehicle source emissions is not anticipated to result in air quality impacts that were not envisioned in the growth projections and regional air quality strategies, and this minor increase in housing in the region would not obstruct or impede implementation of local air quality plans. Additionally, because the proposed projects residents are currently living off-campus, it is expected that there may be a net decrease in vehicle miles travelled and thus vehicle emissions due to the project.

Because the proposed land uses and associated vehicle trips are anticipated in local air quality plans, the project would be consistent at a regional level with the underlying growth forecasts in the RAQS. Impacts would be **less than significant**.

Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Construction Impacts

General Approach and Methodology

Construction of the project components 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. Fugitive dust (PM_{10} 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.

Emissions from the construction phase of project components were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1, available online (www.caleemod.com). The proposed project consists of three construction phases. Phase I includes 850 beds and the Food Service Building; Phase II includes 850 beds; and Phase III includes 866 beds. For the purposes of modeling, it was assumed that construction of project components would commence in November 2017 for Phase I and final facilities in Phase III may come online as late as September 2025. The estimated schedule for each construction phase of the proposed project is shown below.

Phase I – 850 beds and Food Service Building – east of Chapultepec

- Demolition: November 2017 (16 days)
- Grading: November 2017 (27 days)
- Trenching: December 2017 (22 days)
- Building Construction 1 – Foundations: January 2018 (75 days)
- Building Construction 2 – Superstructure: April 2018 (84 days)

- Building Construction 3 – Building Envelope & Interior Buildout: August 2018 (200 days)
- Hardscape/Landscape: February 2019 (81 days)
- Architectural Coating: March 2019 (66 days)

<u>Phase II – 850 beds – west of Chapultepec</u>

- Grading: May 2020 (26 days)
- Trenching: June 2020 (23 days)
- Building Construction 1 – Foundations: July 2020 (53 days)
- Building Construction 2 – Superstructure: September 2020 (147 days)
- Building Construction 3 – Building Envelope & Interior Buildout: May 2021 (143 days)
- Architectural Coating: August 2021 (66 days)
- Hardscape/Landscape: September 2021 (59 days)

<u>Phase III – 866 beds – north of Chapultepec</u>

- Grading: May 2023 (27 days)
- Trenching: June 2023 (24 days)
- Building Construction 1 – Foundations: July 2023 (76 days)
- Building Construction 2 – Superstructure: October 2023 (82 days)
- Building Construction 3 – Building Envelope & Interior Buildout: February 2024 (198 days)
- Hardscape/Landscape: August 2024 (81 days)
- Architectural Coating: August 2024 (66 days)

Equipment mix for construction of the proposed project was provided by SDSU. The equipment mix assumptions were based on project design documents, review of related projects conducted in the Southern California area, and CalEEMod default equipment, where appropriate. The equipment mix is meant to represent a reasonably conservative estimate of construction activity. For the analysis, daily equipment use was provided by SDSU and were assumed to operate 5 days per week. SDSU also provided estimated worker, vendor, and haul trips for each potential construction phase for Phases I, II, and III. The default CalEEMod trip distance for construction vehicles was assumed, which was a one-way distance of 10.8 miles for worker trips and 7.3 miles for vendor trips. The estimated distance to the Miramar Landfill was used for haul trips which was 10 miles one-way. The estimated emissions were calculated based on the project schedule provided by SDSU.

Construction of project components would be subject to SDAPCD Rule 55 – Fugitive Dust Control. This rule requires that construction of project components include steps to restrict visible emissions of fugitive dust beyond the property line (SDAPCD 2009b). Compliance with Rule 55 would limit fugitive dust (PM_{10} and $PM_{2.5}$) that may be generated during grading and construction activities. Construction of project components would also be subject to SDAPCD Rule 67.0.1 – 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 (SDAPCD 2015a). SDSU has committed to using zero VOC coatings for interior and exterior application (**PDF-AQ-1**). The project is not anticipated to need exterior architectural coatings based on the construction type. To be conservative, it was assumed that interior architectural coatings would have a VOC content of 5 grams per liter (g/L). The proposed construction equipment for each phase in the proposed project is shown in **Tables 4.2-6, 4.2-7,** and **4.2-8.**

Table 4.2-6
Construction Assumptions – Phase I

Construction Phase	One-way Vehicle Trips			Equipment		
Phase Type	*Average Daily Worker Trips*	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition	24	0	140	Excavators	2	8
				Rubber Tired Loaders	1	8
Grading	20	0	2,200	Excavators	2	8
				Crawler Tractors	1	8
				Graders	1	4
				Rubber Tired Loaders	1	4
				Scrapers	2	8
				Rubber Tired Dozers	1	6
Building Construction 1 – Foundations	60	20	10	Cranes (Tower Crane - Electric)	2	8
				Forklifts	1	2
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	2	8

Table 4.2-6
Construction Assumptions – Phase I

Construction Phase	One-way Vehicle Trips			Equipment		
				Crane	1	4
				Concrete Pump	1	3
				Drill Rig	2	8
Building Construction 2 - Superstructure	90	30	0	Cranes (Tower Crane - Electric)	2	8
				Forklifts	1	2
				Tractors/Loaders/Backhoes	1	1
				Welders	1	1
				Concrete Pump	1	2
Building Construction 3 - Building Envelope & Interior Buildout	440	24	0	Cranes	1	0.5
				Forklifts	1	4
				Personnel Lift (electric)	2	8
				Boom Hoist	2	4
Hardscape/Landscape	40	8	0	Pavers	1	8
				Rollers	2	8
Trenching	14	4	0	Excavators	2	8
Architectural coating	24	2	0	Air Compressors	4	6

Table 4.2-7
Construction Assumptions – Phase II

Construction Phase	One-way Vehicle Trips			Equipment		
Phase Type	*Average Daily Worker Trips*	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Grading	16	0	715	Excavators	2	8
				Crawler Tractors	1	8
				Graders	1	2
				Rubber Tired Dozers	1	4
				Rubber Tired Loaders	1	4
				Scrapers	1	4
Building Construction 1 - Foundations	30	10	10	Cranes (Tower Crane - Electric)	1	8
				Forklifts	1	2
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	2	8

Table 4.2-7
Construction Assumptions – Phase II

Construction Phase	One-way Vehicle Trips			Equipment		
				Crane	1	2
				Concrete Pump	1	2
				Drill Rig	1	8
Building Construction 2 - Superstructure	70	30	0	Cranes (Tower Crane - Electric)	1	8
				Forklifts	1	2
				Tractors/Loaders/Backhoes	1	1
				Welders	1	1
				Concrete Pump	1	2
Building Construction 3 - Building Envelope & Interior Buildout	240	24	0	Cranes	1	0.5
				Forklifts	1	4
				Personnel Lift (electric)	1	8
				Boom Hoist	2	4
Hardscape/Landscape	24	4	0	Tractors/Loaders/Backhoes	2	8
				Forklifts	1	4
Trenching	10	2	0	Excavators	2	8
Architectural coating	16	2	0	Air Compressors	3	6

Table 4.2-8
Construction Assumptions – Phase III

Construction Phase	One-way Vehicle Trips			Equipment		
Phase Type	*Average Daily Worker Trips*	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Grading	20	0	1,071	Excavators	2	8
				Crawler Tractors	2	8
				Graders	1	4
				Rubber Tired Dozers	1	6
				Rubber Tired Loaders	1	8
				Scrapers	2	8
Building Construction 1 - Foundations	60	20	10	Cranes (Tower Crane - Electric)	2	8
				Forklifts	1	2
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	2	8

Table 4.2-8
Construction Assumptions – Phase III

Construction Phase	One-way Vehicle Trips			Equipment		
				Crane	1	4
				Concrete Pump	1	4
				Drill Rig	2	8
Building Construction 2 - Superstructure	90	30	0	Cranes (Tower Crane - Electric)	1	8
				Forklifts	1	2
				Tractors/Loaders/Backhoes	1	1
				Welders	1	1
				Concrete Pump	1	2
Building Construction 3 - Building Envelope & Interior Buildout	480	24	0	Cranes	1	0.5
				Forklifts	1	4
				Personnel Lift (electric)	4	8
				Boom Hoist	3	4
Hardscape/Landscape	40	8	0	Tractors/Loaders/Backhoes	1	8
				Forklifts	1	4
Trenching	14	4	0	Excavators	2	8
Architectural coating	24	2	0	Air Compressors	4	6

Construction Emissions

Table 4.2-9, Estimated Maximum Daily Unmitigated Construction Criteria Air Pollutant Emissions, shows the estimated maximum unmitigated daily construction emissions associated with the proposed project. As discussed above, the project would involve three distinct phases of construction with little overlap between the phases. Complete details of the emissions calculations are provided in **Appendix C**.

Table 4.2-9
Estimated Maximum Daily Unmitigated Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2017	10.42	130.41	64.54	0.14	10.01	6.32
2018	4.42	44.17	32.08	0.08	3.06	2.26
2019	8.80	40.18	34.57	0.08	3.24	2.25
2020	2.62	32.80	17.69	0.05	1.16	2.10
2021	6.21	14.47	16.56	0.04	1.96	0.98
2022*	-	-	-	-	-	-
2023	4.01	44.99	29.87	0.09	6.35	2.92

Table 4.2-9
Estimated Maximum Daily Unmitigated Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2024	7.69	16.26	25.09	0.07	5.32	1.84
Maximum daily emissions	**10.42**	**130.41**	**64.54**	**0.14**	**10.01**	**6.32**
SDAPCD threshold	*137*	*250*	*550*	*250*	*100*	*67*
Threshold exceeded?	No	No	No	No	No	No

Notes: * There is no construction activity in 2022.
CO = carbon monoxide; NO_x = oxides of nitrogen; SDAPCD = San Diego Air Pollution Control District; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound.
See Appendix C for complete results.

As shown in **Table 4.2-9**, daily construction emissions for the project would not exceed the City of San Diego's significance thresholds for VOC, CO, NO_x, SO_x, PM_{10}, or $PM_{2.5}$. The annual construction emissions are shown in **Table 4.2-10**.

Table 4.2-10
Estimated Annual Unmitigated Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2017	0.12	1.54	0.76	0.00	0.12	0.07
2018	0.30	3.03	2.20	0.01	0.21	0.15
2019	0.35	1.90	1.59	0.00	0.15	0.10
2020	0.08	0.82	0.61	0.00	0.12	0.05
2021	0.24	0.82	0.87	0.00	0.13	0.06
2022*	-	-	-	-	-	-
2023	0.16	1.10	1.17	0.00	0.29	0.11
2024	0.40	1.23	1.88	0.01	0.50	0.16
Maximum annual emissions	**0.40**	**3.03**	**2.20**	**0.01**	**0.50**	**0.16**
SDAPCD threshold	*13.7*	*40*	*100*	*40*	*15*	*10*
Threshold exceeded?	No	No	No	No	No	No

Notes: * There is no construction activity in 2022.
CO = carbon monoxide; NO_x = oxides of nitrogen; SDAPCD = San Diego Air Pollution Control District; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound.
See Appendix C for complete results.

As shown in **Table 4.2-10**, the project would not exceed the SDAPCD annual emissions thresholds for VOC, NO_x, CO, SO_x, $PM_{10,}$ or $PM_{2.5}$ in all project years. Because the project does not exceed the daily or annual SDAPCD thresholds of significance, the project would have a **less than significant** impact.

Operational Impacts

General Approach and Methodology

Mobile Sources (Motor Vehicles)

Following the completion of construction activities, the project would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources (vehicular traffic), as a result of an additional 2,566 students and staff. The daily vehicle miles travelled was based on the traffic impact analysis (Linscott, Law and Greenspan 2017). The proposed project is estimated to generate 11,458 daily vehicle miles travelled. The CalEEMod Version 2016.3.1 model was used to estimate daily emissions from proposed vehicular sources (included in **Appendix C**). CalEEMod Version 2016.3.1 default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances, were conservatively used for the model inputs. project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2025 were conservatively used to estimate emissions associated with vehicular sources. The 2025 operational year represents the completion of the last phase of the project and would represent maximum daily operational emissions.

Diesel Generator

In addition to operational emissions from vehicular sources, it was conservatively assumed that one diesel-powered emergency generator would be required for back-up power for the proposed project for each phase, for a total of three generators. For the purposes of a conservative analysis, it was assumed that each generator would be approximately 677 horsepower with a kilowatt rating of 505. It was assumed that the generator would only be used for emergency back-up power in the event of power outages, as well as for routine testing and maintenance. The proposed project would not run at full capacity while running off power from the emergency generator. Based on historical operations of emergency generators on the SDSU campus, it was assumed that the generator would run for 15 minutes every other week for a total of 20 hours per year. Emissions were calculated using CalEEMod 2016.3.1.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and the curing ovens are calculated in the building energy use module of CalEEMod, as described in the following text.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2016). Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential buildings and on the default factor of pounds of VOC per building square foot per day. The CalEEMod default values for consumer products were assumed.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers using during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings, and SDAPCD's Rule 67.0.1 (Architectural Coatings) governs the VOC content for interior and exterior coatings. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed that the surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating (CAPCOA 2016). Consistent with the architectural coatings used during the construction phase, the applicant will utilize architectural coatings that contain zero VOCs for any reapplication during operation. As a conservative measure, it was assumed that the reapplication of interior architectural coatings would have a VOC content of 5 g/L and exterior would have 50 g/L.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For San Diego County, the average annual "summer" days are estimated to be 180 days (CAPCOA 2016). Emissions associated with potential landscape maintenance equipment were included to conservatively capture potential project operational emission sources.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site.

CalEEMod default values for energy consumption for each land use were applied for the project analysis. The energy use from residential land uses is calculated in CalEEMod based on the California Commercial End-Use Survey database.

Title 24 of the California Code of Regulations serves to enhance and regulate California's building standards. The most recent amendments to Title 24, Part 6, referred to as the 2016 standards, became effective on January 1, 2017. The previous amendments were referred to as the 2013 standards and are currently effective. Buildings constructed in accordance with the 2013 standards will use 25% less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 standards. The building electricity use was provided by the applicant based on anticipated usage from operation of similar type facilities they operate.

Table 4.2-11, Estimated Daily Maximum Operational Emissions, presents the maximum daily emissions associated with the operation of the project after all phases of construction have been completed. Complete details of the emissions calculations are provided in **Appendix C** of this document.

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).

Table 4.2-11
Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	pounds per day					
Area	15.30	0.73	62.48	0.00	0.34	0.34
Energy	2.84	24.38	11.09	0.16	1.96	1.96
Mobile	13.37	46.44	120.10	0.27	13.96	4.12
Stationary	0.83	2.23	2.12	0.00	0.12	0.12
Total	**32.34**	**73.87**	**195.77**	**0.44**	**16.38**	**6.55**
SDAPCD Threshold	*137*	*250*	*550*	*250*	*100*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod Version 2016.3.1. See Appendix C for complete results.
Notes:
VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect CalEEMod "mitigated" output and operational year 2025. The total values may not add up exactly due to rounding.

As shown in **Table 4.2-11** above, the maximum daily operational emissions would not exceed the City of San Diego's thresholds for VOC, CO, NO_x, SO_x, PM_{10}, or $PM_{2.5}$ during the operation of the project.

Table 4.2-12 below shows the maximum annual operational emissions estimated for the project.

Table 4.2-12
Estimated Maximum Annual Operational Criteria Air Pollutant Emissions

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per year					
Area	2.61	0.07	5.62	0.00	0.03	0.03
Energy	0.52	4.45	2.02	0.03	0.36	0.36
Mobile	1.68	6.07	15.19	0.4	1.78	0.53
Stationary	0.03	0.09	0.09	0.00	0.01	0.01
Total	**4.84**	**10.67**	**22.93**	**0.07**	**2.17**	**0.92**
SDAPCD Threshold	*13.7*	*40*	*100*	*40*	*15*	*10*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod Version 2016.3.1. See Appendix C for complete results.
Notes:
VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. These emissions reflect CalEEMod "mitigated" output and operational year 2025. The total values may not add up exactly due to rounding.

As shown in **Table 4.2-12** above, the annual operations emissions for the project do not exceed the City of San Diego's significance thresholds for VOC, CO, NO_x, SO_x, PM_{10}, or $PM_{2.5}$. Therefore, the proposed project would have a **less than significant** impact.

Would the project result in a cumulatively considerable new 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 threshold emissions which exceed quantitative thresholds for ozone precursors)?

In analyzing cumulative impacts from the project, 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 project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project components, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, the project 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).

Additionally, for the San Diego Air Basin, the RAQS serves as the long-term regional air quality planning document for the purpose of assessing cumulative operational emissions within the basin to ensure the SDAB continues to make progress toward NAAQS and CAAQS attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents upon which the RAQS is based would have the potential to result in cumulative impacts if they represent development beyond regional projections.

The SDAB has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. As previously discussed, the emissions of all criteria pollutants would be below the significance levels. Construction would be short term and temporary in nature. Additionally, construction activities required for the implementation of project components would be considered typical of a residential project and would not require atypical construction practices that would include high-emitting activities.

Once construction is completed, construction-related emissions would cease. Operational emissions generated by the project would not result in a significant impact. As such, the project would result in **less than significant** impacts to air quality relative to operational emissions.

Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the SIP and RAQS serve as the primary air quality planning documents for the state and SDAB, respectively. The SIP and RAQS rely 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. Therefore, projects that propose development that is consistent with the growth anticipated by local plans would be consistent with the SIP and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. Implementation of the project would not result in additional population growth or growth-inducing effects; thus, it would be consistent at a regional level with the underlying growth forecasts in the SIP and RAQS.

As a result, the proposed project would not result in a cumulatively considerable contribution to regional O_3 concentrations or other criteria pollutant emissions. Cumulative impacts would be **less than significant**.

Would the project expose sensitive receptors to substantial pollutant concentrations?

Carbon Monoxide Hotspots

Mobile-source impacts occur on two basic scales of motion. Regionally, project-related travel will add to regional trip generation and increase the VMT within the local airshed and the SDAB. Locally, proposed project traffic will be added to the City's roadway system. If such traffic occurs during periods of poor atmospheric ventilation, consists of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and operates on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO "hotspots" in the area immediately around points of congested traffic. Because of continued improvement in mobile emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the basin is steadily decreasing.

Projects contributing to adverse traffic impacts may result in the formation of CO hotspots. To verify that the proposed project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hotspots was conducted. A traffic report (LLG 2017), evaluated the level of service (LOS) (i.e., increased congestion) impacts at intersections affected by the project. The potential for CO hotspots was evaluated based on the results of the traffic report.

City of San Diego's Significance Determination Thresholds (City of San Diego 2016) CO hotspot screening guidance was followed to determine if the project would require a site-specific hotspot analysis. The City recommends that a quantitative analysis of CO hotspots be performed if a proposed development causes a six- or four-lane roadway to deteriorate to a LOS E or worse, causes a six-lane roadway to drop to LOS F, or if a proposed development is within 400 feet of a sensitive receptor and the LOS is D or worse. The project's traffic report determined that up to nine intersections would be impacted by the project and would result in a significant impact without mitigation. Therefore, a quantitative CO Hotspots analysis was performed.

A Transportation Impact Analysis was prepared for the project (LLG 2017), evaluated whether there would be a decrease in the LOS (e.g., congestion) at the intersections affected by the project. The project's traffic analysis evaluated 12 intersections based on existing traffic volumes and current street geometry. Because the proposed project is within 400 feet of a sensitive receptor, the threshold of LOS D was used as the level at which a detailed analysis would be performed. As shown in **Appendix C**, nine of the key study intersections currently operate at an LOS D or worse according to the criteria above: (1) Montezuma Rd and Collwood Blvd (LOS D in PM); (2) 55th St and Hardy Ave (LOS D in PM); (3) 55th St and Montezuma Rd (LOS E in AM and LOS F in PM); (4) Montezuma Rd and Campanile Dr (LOS F in AM and LOS D in PM); (5) College Ave and I-8 Westbound Ramps (LOS D in PM); (6) College Ave and I-8 Eastbound Ramps (LOS D in AM and PM); (7) College Ave and Canyon Crest Ave (LOS F in AM and PM); (8) College Ave and Zura Way (LOS F in AM and PM); and (9) College Ave and Montezuma Way (LOS F in AM and PM) are currently operating at LOS D or worse. The remaining key intersections currently operate at an acceptable LOS during the AM and PM peak hours.

For each scenario (existing plus cumulative projects plus total project and horizon year plus total project), the screening evaluation presents LOS and whether a quantitative CO hotspots analysis may be required. According to the CO Protocol, there is a cap on the number of intersections that need to be analyzed for any one project. For a single project with multiple intersections, only the three intersections representing the worst LOS ratings of the project, and, to the extent they are different intersections, the three intersections representing the highest traffic volumes, need be analyzed. For each intersection failing a screening test as described in this protocol, an additional intersection should be analyzed (Caltrans 2010).

Based on the CO hotspot screening evaluation (**Appendix C**), eight out of the nine intersections that were at LOS D or worse had similar geometries. Therefore, the intersection with the highest volume was selected out of the eight to represent that type of geometry, which was College Avenue and Canyon Crest Drive. The other intersection selected for a quantitative analysis had a unique geometry and was College Avenue and Zura Way. Both intersections were evaluated in the Near Term and Horizon scenarios for CO Hotspots. For each intersection, the highest volume (AM or PM) was used in the analysis as the worst-case scenario. The potential impact of the project on local CO levels was assessed at these intersections with the Caltrans CL4 interface based on the California LINE Source Dispersion Model (CALINE4), which allows microscale CO concentrations to be estimated along each roadway corridor or near intersections (Caltrans 1998a).

The emissions factor represents the weighted average emissions rate of the local San Diego County vehicle fleet expressed in grams per mile per vehicle. Consistent with the traffic scenario, emissions factors for 2025 and 2035 were used for the two intersections. Emissions factors were predicted by EMFAC2014 based on a 5-mile-per-hour (mph) average speed for all of the intersections for approach and departure segments. The hourly traffic volume anticipated to travel on each link, in units of vehicles per hour, was based on information provided by the traffic consultant and modeling assumptions are outlined in **Appendix C**.

Four receptor locations were modeled at College and Canyon Crest and three receptor locations at College Avenue and Zura Way to determine CO ambient concentrations. A receptor was assumed on the sidewalk at each corner of the modeled intersections, to represent the future possibility of extended outdoor exposure. CO concentrations were modeled at these locations to assess the maximum potential CO exposure that could occur in 2025 and 2035. A receptor height of 5.9 feet (1.8 meters) was used in accordance with Caltrans recommendations for all receptor locations (Caltrans 1998b).

The SCAQMD guidance recommends using the highest 1-hour measurement in the last 3 years as the projected future 1-hour CO background concentration for the analysis. A CO concentration of 3.0 parts per million was recorded in 2013 for the Beardsley monitoring station in San Diego and was assumed in the CALINE4 model for 2025 and 2035 (CARB 2016c). To estimate an 8-hour average CO concentration, a persistence factor of 0.73, as calculated based on SCAQMD guidance (SCAQMD 1993), was applied to the output values of predicted concentrations in parts per million at each of the receptor locations.

The results of the model are shown in **Table 4.2-13**, **CALINE4 Predicted Carbon Monoxide Concentrations.** Model input and output data are provided in **Appendix C**.

Table 4.2-13
CALINE4 Predicted Carbon Monoxide Concentrations

Intersection	Maximum Modeled Impact (ppm)	
	1-hour	*8-hour*[a]
College Ave & Canyon Crest Dr 2025	3.4	2.48
College Ave & Canyon Crest Dr 2035	3.5	2.56
College Ave & Zura Way 2025	3.4	2.48
College Ave & Zura Way 2035	3.5	2.56

Source: Caltrans 1998a (CALINE4).
Notes: CO = carbon monoxide; ppm = parts per million.
[a] 8-hour concentrations were obtained by multiplying the 1-hour concentration by a persistence factor of 0.73 (SCAQMD 1993).

As shown in **Table 4.2-13**, the maximum CO concentration predicted for the 1-hour averaging period at the studied intersections would be 3.5 ppm, which is below the 1-hour CO CAAQS of 20 ppm (CARB 2016b). The maximum predicted 8-hour CO concentration of 2.56 ppm at the studied intersections would be below the 8-hour CO CAAQS of 9.0 ppm (CARB 2013). Neither the 1-hour nor 8-hour CAAQS would be equaled or exceeded at any of the intersections studied. Accordingly, the project would not cause or contribute to violations of the CAAQS, and would not result in exposure of sensitive receptors to localized high concentrations of CO. As such, impacts would be **less than significant** to sensitive receptors with regard to potential CO hotspots resulting from project contribution to cumulative traffic-related air quality impacts, **and no mitigation is required**.

Health Impacts of Toxic Air Contaminants

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as TACs or hazardous air pollutants (HAPs). State law has established the framework for California's TAC identification and control project, which is generally more stringent than the federal project, and is aimed at TACs 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.

The greatest potential for TAC emissions during construction would be diesel particulate emissions from heavy equipment operations and heavy-duty trucks, and the associated health impacts to sensitive receptors. The closest sensitive receptors would be the existing residents in the Chapultepec Hall. The project would also emit TAC emissions during operation from the standby emergency generators and from natural gas combustion. Accordingly, a HRA was performed to evaluate the risk to sensitive receptors project generated TAC emissions would have. The following paragraphs describe the HRA and the detailed assessment is provided in **Appendix C.**

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The SDAPCD recommends an incremental cancer risk threshold of 10 in a million. "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 based on the use of standard risk-assessment methodology. The cancer burden is determined for the population located within the zone of impact, defined as the area within the one in one million cancer risk isopleth for a 70-year exposure. HARP2 was used to generate an isopleth, which is a line of a constant value, showing the area exposed to a cancer risk above one in one million. Cancer burden was conservatively estimated by using the distance of the furthest receptor within the one in a million isopleth as the radius of a zone of impact.

Some TACs increase non-cancer health risk due to long-term (chronic) exposures. The Chronic Hazard Index (HIC) is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system. The HIC estimates for all receptor types used the 'OEHHA Derived' calculation method, which uses high end exposure parameters for the inhalation and next top two exposure pathways and mean exposure parameters for the remaining pathways for non-cancer risk estimates. The HIC is the sum of the individual substance chronic hazard indices for all TACs affecting the same target organ system.[4] A hazard index less of than one (1.0) means that adverse health effects are not expected. Within this analysis, noncarcinogenic exposures of less than 1.0 are considered less than significant. The SDAPCD recommends a HIC significance threshold of 1.0 (project increment).

The air dispersion modeling methodology was based on generally accepted modeling practices of the SDAPCD (SDAPCD 2015b). Air dispersion modeling was performed using the EPA's AERMOD (Version 16216r) modeling system (computer software) with the Lakes Environmental Software implementation/user interface, AERMOD View Version 9.3.0. The HRA followed the Office of Environmental Health Hazard Assessment (OEHHA) 2015 guidelines (OEHHA 2015) and SDAPCD Tier-1 techniques to calculate the health risk impacts at all receptors including the nearby residential receptors, the nearest school, and off-site worker

---

4 The Chronic Hazard Index estimates for all receptor types used the OEHHA Derived calculation method (OEHHA 2015).

receptors, as further discussed below. The dispersion modeling included the use of standard regulatory default options. AERMOD parameters were selected consistent with the SDAPCD and EPA guidance and identified as representative of the project site and project activities. Principal parameters of this modeling are presented in **Table 4.2-14**.

Table 4.2-14
AERMOD Principle Parameters

Parameter	Details
Meteorological Data	AERMOD-specific meteorological (met) data for the SDSU area (Kearny Mesa Station) was used for the dispersion modeling. For the Project, a 3-year met data set from 2010 through 2012 was obtained from the SDAPCD in a preprocessed format suitable for use in AERMOD.
Urban versus Rural Option	Urban dispersion option was selected due to the developed nature of the project area and per SDAPCD guidelines
On-site Buildings	For the operational scenario, a total of 11 on-site buildings close to the emission sources were included in the modeling using best available dimensional data. Building downwash effects were assessed using Building Profile Input Program (BPIP) with Plume Rise Model Enhancements (PRIME). No buildings were included for the construction scenario.
Terrain Characteristics	The terrain south of the project site is generally flat, with a canyon along the northern boundary. The elevation of the site is 440 feet above sea level (ASL). The proposed stack heights for the operational scenario are all assumed to be 3.84 meters above ground level (AGL).
Elevation Data	Digital elevation data were imported into AERMOD and elevations were assigned to receptors, buildings, and emission sources, as necessary. Digital elevation data were obtained through the AERMOD View™ WebGIS import feature in the United States Geological Survey's (USGS) 7.5-minute DEM data.
Source Equipment Operating Scenarios	Air dispersion modeling of operational activities was conducted using the PM10 exhaust (representative of DPM) estimates provided by CalEEMod for the emergency generators.
Emission Sources and Release Parameters	The exhaust stacks from the emergency generators were modeled as individual point sources for the operation scenario. It was assumed that one emergency generator would be installed during each phase of project development. A single area source was used to model the construction scenario.
Source Release Characterizations	Construction: An area of approximately 7-acres was assumed and an initial lateral dimension of 1.4 meters and release height of 5 meters was used for diesel equipment and truck exhaust. For on-road diesel trucks, the roundtrip length was assumed to be approximately 2,000 feet to capture pass-by exposure for individual receptors, with the PM10 exhaust from trucks summed with on-site equipment to estimate maximum total DPM exposure at proximate receptors. Operation: For modeling emergency generator emissions, it was assumed that each generator would be approximately 677 horsepower with a kilowatt rating of 505. It was assumed that the generator would run for a maximum of 15 minutes every other week for a total of 20 hours per year. For AERMOD, a stack height of 3.84 meters, stack diameter of 0.17 meters, gas exit temperature of 798.16 Kelvin, and gas exit velocity of 160.56 meters per second was assumed for each generator based on the projected horsepower.

Note: See Appendix C.

A uniform 700 m by 700 m Cartesian receptor grid with 50-meter spacing was used for the operational scenario to ensure impacts were below the appropriate CEQA thresholds at all locations. Discrete Cartesian receptors were used in the construction and operational scenarios to evaluate the locations of the maximally exposed residences. A series of receptors were placed along the residences just north of the project. The grid network of receptors is used to establish the impact area and area where the maximum impact would occur.

The health risk calculations were performed using the Hotspots Analysis and Reporting Program Version 2 (HARP2) Risk Assessment Standalone Tool (RAST, version 16217). AERMOD was run with all sources (construction and operation) emitting unit emissions (1 gram per second) to obtain the necessary input values for HARP2. The dispersion factor values that were determined for each source using AERMOD were imported into HARP2 and used in conjunction with hourly and annual emissions to determine the ground level concentrations for each pollutant. The ground level concentrations are then used to estimate the long-term cancer health risk to an individual, and the non-cancer chronic health index.

Construction of project components would require use of heavy-duty construction equipment, which is subject to a CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce diesel particulate emissions, and would involve use of diesel trucks, which are also subject to an Airborne Toxics Control Measure. Construction of project components would occur in three phases of 2-3 years each and would be periodic and short term within each phase. Follow completion of construction activities, project-related TAC emissions would cease. Additionally, operational diesel-powered generators would only operate during testing and maintenance periods, and during emergency power outages. The results of the HRA during construction and operation are provided in **Table 4.2-15**.

Table 4.2-15
Summary of Maximum Cancer and Chronic Health Risks

Impact Analysis	Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Off-Site MEIR					
Construction HRA	Cancer Risk	Per Million	7.97	10	Less than Significant
	Chronic Hazard Index	Index Value	0.004	1.0	Less than Significant
Operational HRA	Cancer Risk	Per Million	1.45	10	Less than Significant
	Chronic Hazard Index	Index Value	0.0004	1.0	Less than Significant
On-Site MEIR					
Construction HRA	Cancer Risk	Per Million	4.84	10	Less than Significant
	Chronic Hazard Index	Index Value	0.006	1.0	Less than Significant

Table 4.2-15
Summary of Maximum Cancer and Chronic Health Risks

Impact Analysis	Impact Parameter	Units	Project Impact	CEQA Threshold	Level of Significance
Operational HRA	Cancer Risk	Per Million	0.63	10	Less than Significant
	Chronic Hazard Index	Index Value	0.0008	1.0	Less than Significant

Source: SDAPCD 2015b.
Notes: CEQA = California Environmental Quality Act; HRA = Health Risk Assessment; MEIR = maximally exposed individual resident

As shown in **Table 4.2-15**, the health risks resulting from project generated TAC emissions would be below the levels of significance for both construction and operation. The TAC emissions from construction would be short term in nature and would cease after the construction period. The TAC emissions during operation from the emergency generator and natural gas combustion would be infrequent and would not pose a significant risk to nearby sensitive receptors. As such, the exposure of project-related TAC emission impacts to sensitive receptors would be **less than significant**. It should be noted that the receptors evaluated in the HRA were located at Chapultapec Hall, less than 50 feet away and the risk was not significant. Additional receptors further away, such as Hardy Elementary School, would have even less risk resulting from the project.

Health Impacts of Criteria Air Pollutants

Construction and operation of the project would not result in emissions that exceed the City's emission thresholds for any criteria air pollutants. Regarding VOCs, some VOCs would be associated with motor vehicles and construction equipment, while others are associated with architectural coatings, the emissions of which would not result in the exceedances of the City's thresholds. Generally, the VOCs in architectural coatings are of relatively low toxicity. Additionally, SDAPCD Rule 67.0.1 restricts the VOC content of coatings for both construction and operational applications. SDSU has committed to using architectural coatings that contain zero VOCs.

In addition, VOCs and NO_x are precursors to O_3, for which the SDAB is designated as nonattainment with respect to the NAAQS and CAAQS (the SDAB is designated by the EPA as an attainment area for the 1-hour O_3 NAAQS standard and 1997 8-hour NAAQS standard). The health effects associated with O_3, as discussed in **Section 4.2.2**, are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O_3

concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SDAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur because exceedances of the O_3 AAQS tend to occur between April and October when solar radiation is highest.

The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Nonetheless, the VOC and NO_x emissions associated with project construction could minimally contribute to regional O_3 concentrations and the associated health impacts. Due to the minimal contribution during construction and operation, as well as the existing good air quality in coastal San Diego areas, health impacts would be considered **less than significant**.

Similar to O_3, construction of the proposed project would not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter. The project would also not result in substantial DPM emissions during construction and operation and therefore, would not result in significant health effects related to DPM exposure. Due to the minimal contribution of particulate matter during construction and operation, health impacts would be considered **less than significant**.

According to the construction emissions analysis, construction of the proposed project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. As described in **Section 4.2.2**, NO_2 and NO_x health impacts are associated with respiratory irritation, which may be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, these operations would be relatively short term, and the proposed project would be required to comply with SDAPCD Rule 55 which limits the amount of fugitive dust generated during construction. Additionally, off-road construction equipment would be operating at various portions of the site and would not be concentrated in one portion of the site at any one time. Construction of the proposed project would not require any stationary emission sources that would create substantial, localized NO_x impacts. Therefore, health impacts would be considered **less than significant**.

The VOC and NO_x emissions, as described previously, would minimally contribute to regional O_3 concentrations and the associated health effects. In addition to O_3, NO_x emissions would not contribute to potential exceedances of the NAAQS and CAAQS for NO_2. As shown in **Table 4.2-2**, the existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards. Thus, it is not expected that the project's operational NO_x emissions would result in exceedances of the NO_2 standards or contribute to the associated health effects. CO tends to be a localized impact associated with congested intersections. The associated CO "hotspots" were discussed previously as a less-than-significant impact. Thus, the project's CO emissions would not contribute to significant health effects associated with this pollutant. PM_{10} and $PM_{2.5}$ would not contribute to potential exceedances of the NAAQS and CAAQS for particulate matter and would not obstruct the SDAB from coming into attainment for these pollutants and would not contribute to significant health effects associated with particulates. Therefore, health impacts associated with criteria air pollutants would be considered **less than significant**.

Would the project create objectionable odors affecting a substantial number of people?

Odors would be generated from vehicles and/or equipment exhaust emissions during construction of the project facilities. 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 for the types of construction activities anticipated for project components, would 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**.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine if potential odors would have a significant impact. Examples of land uses and industrial operations that are commonly associated with odor complaints include agricultural uses, wastewater treatment plants, food processing facilities, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. In addition to the odor source, the distance between the sensitive receptor(s) and the odor source, as well as the local meteorological conditions, are considerations in the potential for a project to frequently expose the public to objectionable odors. Although localized air quality impacts are focused on potential impacts to sensitive receptors, such as residences and schools, other land uses where people may congregate (e.g., workplaces) or uses with the intent to attract people (e.g., restaurants and visitor-serving accommodations), should also be considered in the evaluation of potential odor nuisance impacts.

The project would not include any land use types that generate odors as described above; therefore, impacts related to odor caused by the project would be **less than significant**.

4.2.7 MITIGATION MEASURES

All potential impacts of the proposed project would be less than significant as a result of compliance with applicable laws and regulations and the implementation of corresponding project design features. Therefore, no mitigation measures are required.

4.2.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

There are no mitigation measures required; therefore, project impacts related to air quality would remain less than significant.

4.2.9 REFERENCES

CARB (California Air Resources Board). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000. Accessed October 2016. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf.

CARB. 2001. *The 2001 California Almanac of Emissions and Air Quality*. August 11, 2001. Accessed November 2016. https://www.arb.ca.gov/aqd/almanac/almanac01/almanac01.htm.

CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005. https://www.arb.ca.gov/ch/handbook.pdf.

CARB. 2008. *Climate Change Proposed Scoping Plan: A Framework for Change*. October 2008; approved December 12, 2008. http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf.

CARB, California Climate Action Registry, ICLEI - Local Governments for Sustainability, and The Climate Registry. 2010. Local Government Operations Protocol – For the Quantification and Reporting of Greenhouse Gas Emissions Inventories. Version 1.1. May 2010. http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

CARB. 2011. Final Regulation Order – Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines. Accessed April 2015. http://www.arb.ca.gov/diesel/documents/FinalReg2011.pdf.

CARB. 2012. "News Release: California Air Resources Board Approves Advanced Clean Car Rules." January 27, 2012. Accessed October 2016. https://www.arb.ca.gov/newsrel/newsrelease.php?id=282.

CARB. 2014a. "Glossary of Air Pollutant Terms." Accessed April 24, 2014. http://www.arb.ca.gov/html/gloss.htm.

CARB. 2014b. "California Greenhouse Gas Inventory for 2000–2012 – by Category as Defined in the 2008 Scoping Plan." March 24, 2014. http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-12_2014-03-24.pdf.

CARB. 2014c. First Update to the Climate Change Scoping Plan: Building on the Framework. May 2014. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_ change_scoping_plan.pdf.

CARB. 2016a. "Glossary of Air Pollutant Terms." Accessed October 2016. http://www.arb.ca.gov/html/gloss.htm.

CARB. 2016b. "Ambient Air Quality Standards." May 5, 2016. Accessed October 2016. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB. 2016c. "iADAM: Air Quality Data Statistics." Accessed October 2016. http://arb.ca.gov/adam.

Caltrans. 1998a. CALINE4 - A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways. Version 1.32. Written by Sonoma Technology, Inc. Petaluma, California. Sponsored by the University of California, Davis Institute of Transportation Studies and Caltrans. http://www.dot.ca.gov/hq/InfoSvcs/EngApps/.

Caltrans. 1998b. User's Guide for CL4: A User-Friendly Interface for the CALINE4 Model for Transportation Project Impact Assessments. User's Guide STI-997480-1814-UG. June 1998. http://www.dot.ca.gov/hq/env/air/documents/CL4Guide.pdf

Caltrans. 2010. CO Protocol. October 13. Accessed March 2017. http://www.dot.ca.gov/hq/env/air/documents/COProtocol_searchable.pdf.

City of San Diego. 2008. *General Plan*. March 10. Accessed November 2016. https://www.sandiego.gov/planning/genplan#genplan.

City of San Diego. 2015. Climate Action Plan. December. Accessed January 2017. https://www.sandiego.gov/sites/default/files/final_july_2016_cap.pdf.

City of San Diego. 2016. *California Environmental Quality Act Significance Determination Thresholds*. July. Accessed November 2016. https://www.sandiego.gov/sites/default/files/july_2016_ceqa_thresholds_final_0.pdf.

City of San Diego. 2017. San Diego Municipal Code, Chapter 13: Zones, Article 1: Base Zones, Division 4: Residential Base Zones. Sections 131.0403–131.0406. Accessed January 9, 2017. http://docs.sandiego.gov/municode/MuniCodeChapter13/Ch13Art01Division04.pdf.

EPA. 2014. "NAAQS Table." Accessed October 2016. https://www.epa.gov/criteria-air-pollutants/naaqs-table.

EPA. 2015. "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013." April 15, 2014. Accessed January 2017. http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html.

EPA. 2016. "Outdoor Air Quality Data." Last updated September 14, 2016. Accessed October 2016. https://www.epa.gov/outdoor-air-quality-data/monitor-values-report.

LLG (Linscott, Law & Greenspan, Engineers). 2017. *Transportation Impact Analysis, SDSU Student Housing.* February 16, 2017. Prepared by Linscott, Law & Greenspan, Engineers.

Office of Environmental Health Hazard Assessment (OEHHA). 2015. *Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments*. February 2015. https://oehha.ca.gov/media/downloads/crnr/2015 guidancemanual.pdf.

San Diego Association of Governments (SANDAG). 2004. *Regional Comprehensive Plan*. July. Accessed November 2016. http://www.sandag.org/programs/land_use_and_regional_growth/comprehensive_land_use_and_regional_growth_projects/RCP/rcp_final_complete.pdf.

SANDAG. 2011. 2050 Regional Transportation Plan. October 2011. Accessed January 2017. http://www.sandag.org/uploads/2050RTP/F2050rtp_all.pdf.

SANDAG. 2013. "Series 13: 2050 Regional Growth Forecast." Accepted by SANDAG Board of Directors October 25, 2013. Accessed October 2016. http://www.sandag.org/index.asp?classid=12&subclassid=84 &projectid=503&fuseaction=projects.detail.

SANDAG. 2015. *San Diego Forward The Regional Plan*. October. Accessed November 2016. http://www.sdforward.com/pdfs/RP_final/The%20Plan%20-%20combined.pdf.

San Diego Air Pollution Control District (SDAPCD). 1969. Rules and Regulations. Regulation IV. Prohibitions. Rule 51. Nuisance. Effective January 1, 1969. http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Rules_and_Regulations/Prohibitions/APCD_R50-1-51.pdf.

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

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

SDAPCD. 2009a. *2009 Regional Air Quality Strategy Revision*. April 2009. http://www.sdapcd.org/planning/2009-RAQS.pdf.

SDAPCD. 2009b. Rules and Regulations. Regulation IV. Prohibitions. Rule 55. Fugitive Dust. Adopted June 24, 2009; effective December 24, 2009. http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Rules_and_Regulations/Prohibitions/APCD_R55.pdf.

SDAPCD. 2012. *Redesignation Request and Maintenance Plan for the 1997 National Ozone Standard for San Diego County*. December 15, 2012. http://www.sdapcd.org/planning/8_Hour_O3_Maint-Plan.pdf.

SDAPCD. 2015a. Rules and Regulations. Regulation IV. Prohibitions. Rule 67.0.1. Architectural Coatings. Revised June 24, 2015. http://www.sdapcd.org/content/dam/sdc/apcd/PDF/Rules_and_Regulations/Prohibitions/APCD_R67-0-1.pdf.

SDAPCD. 2015b. *Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs).* June 2015. http://www.sdapcd.org/content/dam/sdc/apcd/ PDF/Misc/APCD_HRA_Guidelines.pdf.

SDAPCD. 2016a. "Attainment Status." Accessed October 2016. http://www.sdapcd.org/content/sdc/apcd/en/air-quality-planning/attainment-status.html.

SDAPCD. 2016b. "Regulation II: Permits; Rule 20.2: New Source Review – Non-Major Sources." In *Rules and Regulations of the Air Pollution Control District of San Diego County*. Amended April 27, 2016. http://www.sdapcd.org/content/dam/sdc/apcd/PDF/ Rules_and_ Regulations/Public%20Hearings/NSR_Rules/AttF-R20.2_Change_Copy.pdf.

WRCC (Western Regional Climate Center). 2016. "Escondido. Temperature and Precipitation." Accessed November 2016. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca2862.