5.2 AIR QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for the City of Hope Campus Plan to impact air quality in a local and regional context. This evaluation is based on the methodology recommended by the South Coast Air Quality Management District (SCAQMD). The analysis focuses on air pollution from regional emissions and localized pollutant concentrations. Criteria air pollutant emissions modeling for the proposed project, as modeled using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, is included in Appendix C1 of this DEIR. Transportation-sector impacts are based on trip generation and vehicle miles traveled provided by Fehr & Peers (see Appendix J1). Cumulative impacts related to air quality are based on the regional boundaries of the South Coast Air Basin (SoCAB).

5.2.1 Environmental Setting

5.2.1.1 REGULATORY SETTING

Ambient air quality standards (AAQS) have been adopted at the state and federal levels for criteria air pollutants. In addition, both the state and federal government regulate the release of toxic air contaminants (TACs). The project site is in the SoCAB and subject to the rules and regulations imposed by SCAQMD, the California AAQS adopted by California Air Resources Board (CARB), and National AAQS adopted by the United States Environmental Protection Agency (EPA). Federal, state, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the project are summarized in this section.

Federal and State

Ambient Air Quality Standards

The Clean Air Act was passed in 1963 by the US Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The Clean Air Act allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act, signed into law in 1988, requires all areas of the state to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS.

The National and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect "sensitive receptors" most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

5. Environmental Analysis
AIR QUALITY

Both California and the federal government have established health-based AAQS for seven air pollutants, which are shown in Table 5.2-1, *Ambient Air Quality Standards for Criteria Pollutants*. These pollutants are ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

Table 5.2-1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Ozone (O_3)[3]	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.070 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	*	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm	
	24 hours	0.04 ppm	0.14 ppm	
Respirable Coarse Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 µg/m^3	150 µg/m^3	
Respirable Fine Particulate Matter ($PM_{2.5}$)[4]	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m^3	
Lead (Pb)	30-Day Average	1.5 µg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	*	1.5 µg/m^3	
	Rolling 3-Month Average	*	0.15 µg/m^3	
Sulfates (SO_4)[5]	24 hours	25 µg/m^3	*	Industrial processes.

Table 5.2-1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Visibility Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24 hour	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Source: CARB 2016a.
Notes: ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter
* Standard has not been established for this pollutant/duration by this entity.
[1] California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
[2] National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
[3] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
[4] 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 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
[5] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

California has also adopted a host of other regulations that reduce criteria pollutant emissions, including:

- AB 1493: Pavley Fuel Efficiency Standards
- California Code of Regulations (CCR), Title 20: Appliance Energy Efficiency Standards
- 24 CCR, Part 6: Building and Energy Efficiency Standards
- 24 CCR, Part 11: Green Building Standards Code

Tanner Air Toxics Act and Air Toxics Hots Information and Assessment Act

Public exposure to TACs is a significant environmental health issue in California. In 1983, the California legislature enacted a program to identify the health effects of TACs and reduce exposure to them. The California Health and Safety Code defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health" (HSC § 39655). A substance that is listed as a hazardous air pollutant pursuant to Section 112(b) of the federal Clean Air Act (see 42 US Code § 7412[b]) is a toxic air contaminant. Under state law, the California Environmental Protection Agency, acting through CARB, is authorized to identify a substance as a TAC if it is an air pollutant that may cause or contribute to an increase in mortality or serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act set up a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit that TAC. If there is a safe threshold for a substance (i.e., a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate "toxics best available control technology" to minimize emissions. To date, CARB has established formal control measures for 11 TACs that are identified as having no safe threshold.

Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. 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 through notices and public meetings.

CARB has promulgated the following specific rules to limit TAC emissions:

- **CARB Rule 2485** (13 CCR, Chapter 10 § 2485), Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- **CARB Rule 2480** (13 CCR Chapter 10 § 2480), Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- **CARB Rule 2477** (13 CCR § 2477 and Article 8), Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate

Air Pollutants of Concern

Criteria Air Pollutants

The pollutants emitted into the ambient air by stationary and mobile sources are categorized as primary and/or secondary pollutants. Primary air pollutants are emitted directly from sources. Carbon monoxide

(CO), volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. Of these, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are "criteria air pollutants," which means that AAQS have been established for them. VOC and NO_x are criteria pollutant precursors that form secondary criteria air pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants.

A description of each of the primary and secondary criteria air pollutants and its known health effects is presented below.

- **Carbon Monoxide** is a colorless, odorless gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. The highest ambient CO concentrations are generally found near traffic-congested corridors and intersections. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (SCAQMD 2005; USEPA 2016). The SoCAB is designated under the California and National AAQS as being in attainment of CO criteria levels (CARB 2015).

- **Volatile Organic Compounds** are composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of VOCs. Other sources include evaporative emissions from paints and solvents, asphalt paving, and household consumer products such as aerosols (SCAQMD 2005). There are no AAQS for VOCs. However, because they contribute to the formation of O_3, SCAQMD has established a significance threshold.

- **Nitrogen Oxides** are a by-product of fuel combustion and contribute to the formation of ground-level O_3, PM_{10}, and $PM_{2.5}$. The two major forms of NO_X are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. The principal form of NO_X produced by combustion is NO, but NO reacts quickly with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant and more injurious than NO in equal concentrations. At atmospheric concentrations, however, NO_2 is only potentially irritating. NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 exposure concentrations near roadways are of particular concern for susceptible individuals, including asthmatics, children, and the elderly. Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects, including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between elevated short-term NO_2 concentrations and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma (SCAQMD 2005; USEPA 2016). The SoCAB is designated an attainment area for NO_2 under the National and California AAQS (CARB 2015).

- **Sulfur Dioxide** is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and chemical processes at plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2. When sulfur dioxide forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_X). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. Current scientific evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects, including bronchoconstriction and increased asthma symptoms. These effects are particularly adverse for asthmatics at elevated ventilation rates (e.g., while exercising or playing) at lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. Studies also show a connection between short-term exposure and increased visits to emergency facilities and hospital admissions for respiratory illnesses, particularly in at-risk populations such as children, the elderly, and asthmatics (SCAQMD 2005; USEPA 2016). The SoCAB is designated attainment under the California and National AAQS (CARB 2015).

- **Suspended Particulate Matter** consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include particulate matter with an aerodynamic diameter of 10 microns or less (i.e., ≤10 millionths of a meter or 0.0004 inch). Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns or less (i.e., ≤2.5 millionths of a meter or 0.0001 inch). Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems. The EPA's scientific review concluded that $PM_{2.5}$, which penetrates deeply into the lungs, is more likely than PM_{10} to contribute to health effects and at far lower concentrations. These health effects include premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing) (SCAQMD 2005). There has been emerging evidence that ultrafine particulates (UFPs), which are even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤0.1 millionths of a meter or <0.000004 inch), have human health implications, because UFPs toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs (SCAQMD 2013). However, the EPA or CARB has yet to adopt AAQS to regulate these particulates. Diesel particulate matter is classified by CARB as a carcinogen (CARB 1998). Particulate matter can also cause environmental effects such as visibility impairment,[1] environmental damage,[2] and aesthetic damage[3] (SCAQMD 2005; USEPA 2016). The SoCAB is a nonattainment area for $PM_{2.5}$ under California and National AAQS and a nonattainment area for PM_{10} under the California AAQS (CARB 2015).

[1] $PM_{2.5}$ is the main cause of reduced visibility (haze) in parts of the United States.
[2] Particulate matter can be carried over long distances by wind and then settle on ground or water, making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.
[3] Particulate matter can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

- **Ozone** is commonly referred to as "smog" and is a gas that is formed when VOCs and NO_X, both by-products of internal combustion engine exhaust, undergo photochemical reactions in sunlight. O_3 is a secondary criteria air pollutant. O_3 concentrations are generally highest during the summer months when direct sunlight, light winds, and warm temperatures create favorable conditions for its formation. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Breathing O_3 can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level O_3 also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. O_3 also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. In particular, O_3 harms sensitive vegetation during the growing season (SCAQMD 2005; USEPA 2016). The SoCAB is designated extreme nonattainment under the California AAQS (1-hour and 8-hour) and National AAQS (8-hour) (CARB 2015).

- **Lead** is a metal found naturally in the environment as well as in manufactured products. Once taken into the body, lead distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood. The effects of lead most commonly encountered in current populations are neurological effects in children and cardiovascular effects in adults (e.g., high blood pressure and heart disease). Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ (SCAQMD 2005; USEPA 2016). The major sources of lead emissions have historically been mobile and industrial sources. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent between 1980 and 1999. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline. However, in 2008 the EPA and CARB adopted more strict lead standards, and special monitoring sites immediately downwind of lead sources recorded very localized violations of the new state and federal standards.[4] As a result of these violations, the Los Angeles County portion of the SoCAB is designated as nonattainment under the National AAQS for lead (SCAQMD 2012; CARB 2015). Because emissions of lead are found only in projects that are permitted by SCAQMD, lead is not a pollutant of concern for the proposed project.

Toxic Air Contaminants

By the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be

[4] Source-oriented monitors record concentrations of lead at lead-related industrial facilities in the SoCAB, which include Exide Technologies in the City of Commerce; Quemetco, Inc., in the City of Industry; Trojan Battery Company in Santa Fe Springs; and Exide Technologies in Vernon. Monitoring conducted between 2004 through 2007 showed that the Trojan Battery Company and Exide Technologies exceed the federal standards (SCAQMD 2012).

attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

Diesel Particulate Matter

In 1998, CARB identified diesel particulate matter as a TAC. Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particles are 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs.

Air Quality Management Planning

SCAQMD is the agency responsible for improving air quality in the SoCAB and assuring that the National and California AAQS are attained and maintained. SCAQMD is responsible for preparing the air quality management plan (AQMP) for the SoCAB in coordination with the Southern California Association of Governments (SCAG). Since 1979, a number of AQMPs have been prepared.

2016 AQMP

On March 3, 2017, SCAQMD adopted the 2016 AQMP, which serves as an update to the 2012 AQMP. The 2016 AQMP addresses strategies and measures to attain the following National AAQS:

- 2008 National 8-hour ozone standard by 2031,
- 2012 National annual $PM_{2.5}$ standard by 2025[5],
- 2006 National 24-hour $PM_{2.5}$ standard by 2019,
- 1997 National 8-hour ozone standard by 2023, and the
- 1979 National 1-hour ozone standard by year 2022.

It is projected that total NO_X emissions in the SoCAB would need to be reduced to 150 tons per day (tpd) by year 2023 and to 100 tpd in year 2031 to meet the 1997 and 2008 federal 8-hour ozone standards. The strategy to meet the 1997 federal 8-hour ozone standard would also lead to attaining the 1979 federal 1-hour ozone standard by year 2022 (SCAQMD 2016a), which requires reducing NO_X emissions in the SoCAB to 250 tpd. This is approximately 45 percent additional reductions above existing regulations for the 2023 ozone standard and 55 percent additional reductions above existing regulations to meet the 2031 ozone standard.

Reducing NO_X emissions would also reduce $PM_{2.5}$ concentrations within the SoCAB. However, as the goal is to meet the 2012 federal annual $PM_{2.5}$ standard no later than year 2025, SCAQMD is seeking to reclassify the SoCAB from "moderate" to "serious" nonattainment under this federal standard. A "moderate" non-attainment would require meeting the 2012 federal standard by no later than 2021.

Overall, the 2016 AQMP is composed of stationary and mobile-source emission reductions from regulatory control measures, incentive-based programs, co-benefits from climate programs, mobile-source strategies, and

[5] The 2016 AQMP requests a reclassification from moderate to serious non-attainment for the 2012 National $PM_{2.5}$ standard.

reductions from federal sources such as aircrafts, locomotives, and ocean-going vessels. Strategies outlined in the 2016 AQMP would be implemented in collaboration between CARB and the EPA (SCAQMD 2017).

Lead Implementation Plan

In 2008, the EPA designated the Los Angeles County portion of the SoCAB as a nonattainment area under the federal lead classification due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in the City of Vernon and the City of Industry that exceeded the new standard in the 2007-to-2009 period. The remainder of the SoCAB, outside the Los Angeles County nonattainment area, remains in attainment of the new 2008 lead standard. On May 24, 2012, CARB approved the State Implementation Plan (SIP) revision for the federal lead standard, which the EPA revised in 2008. Lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011. The SIP revision was submitted to the EPA for approval.

SCAQMD Rules and Regulations

All projects are subject to SCAQMD rules and regulations in effect at the time of activity, including the following:

- **Rule 401, Visible Emissions.** This rule is intended to prevent the discharge of pollutant emissions from an emissions source that results in visible emissions. Specifically, the rule prohibits the discharge of any air contaminant into the atmosphere by a person from any single source of emission for a period or periods aggregating more than three minutes in any one hour that is as dark as or darker than designated No. 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

- **Rule 402, Nuisance.** This rule is intended to prevent the discharge of pollutant emissions from an emissions source that results in a public nuisance. Specifically, this rule prohibits any person from discharging quantities of air contaminants or other material from any source such that it would result in an injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. Additionally, the discharge of air contaminants would also be prohibited where it would endanger the comfort, repose, health, or safety of any number of persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

- **Rule 403, Fugitive Dust.** This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (human-made) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Rule 403 applies to any activity or human-made condition capable of generating fugitive dust, and requires best available control measures to be applied to earth moving and grading activities.

- **Rule 1113, Architectural Coatings.** This rule serves to limit the VOC content of architectural coatings used on projects in the SCAQMD. Any person who supplies, sells, offers for sale, or manufactures any

architectural coating for use on projects in the SCAQMD must comply with the current VOC standards set in this rule.

Local

City of Duarte

The City of Duarte's sustainable development practices in the City's development code are summarized below. Per the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983, the Office of Statewide Health Planning and Development (OSHPD) is the enforcement agency for hospital buildings, acute psychiatric hospitals, skilled nursing facilities, and intermediate care facilities—as defined in Section 129725 of the Health and Safety Code—with regard to the applicable Title 24 building standards, preempting the local jurisdiction. However, the City of Duarte would have jurisdiction over parts of the proposed Campus Plan that are not under OSHPD's jurisdiction—such as surface parking, landscaping, parking structure, and other buildings not subject to OSHPD.

City of Duarte Sustainable Development Practices

The City of Duarte Sustainable Development Practices is codified in Chapter 19.52, Article 3, of the City's development code. This chapter includes guidelines and standards for conservation of natural resources, increased energy efficiency, and transit (e.g., transportation demand management, active transit design). Specific sustainable design requirements for energy efficiency, water conservation, transit and pedestrian access, and construction debris recycling depend on the level of development based on size (e.g., number of dwelling units, amount of nonresidential square footage), per Section 19.52.020(B). There are four levels of development, Level 1 to Level 4. Level 1 has the fewest requirements and Level 4 the most. In addition to these requirements, Chapter 19.52 includes optional measures that may be incorporated into an individual project.

City of Irwindale

The City of Irwindale has adopted the Los Angeles County Green Building Standards Code, which incorporates the California Green Building Standards Code. As with the City of Duarte, OSHPD is the enforcement agency for Title 24 building standards compliance. However, the City of Irwindale would have jurisdiction over components and facilities of the proposed Campus Plan that are not subject to OSHPD's jurisdiction.

5.2.1.2 EXISTING CONDITIONS

South Coast Air Basin

The project site is in the SoCAB, which includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The SoCAB is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather

pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds (SCAQMD 2005).

Temperature and Precipitation

The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station nearest to the project plan area is the Azusa City PK FC 143 Station Monitoring Station (ID No. 040410). The average low is reported at 39.6°F in December, and the average high is 91.9°F in August (WRCC 2016).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November through April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. Rainfall averages 18.96 inches per year in the project area (WRCC 2016).

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent. Low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SoCAB (SCAQMD 2005).

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions (SCAQMD 2005).

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These are the marine/subsidence inversion and the radiation inversion. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area (SCAQMD 2005).

SoCAB Nonattainment Areas

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the SIP. Areas are classified as attainment or nonattainment areas for particular pollutants depending on whether they meet the ambient air quality standards. Severity classifications for ozone nonattainment range in magnitude from marginal, moderate, and serious to severe and extreme.

- **Unclassified.** A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
- **Attainment.** A pollutant is in attainment if the AAQS for that pollutant was not violated at any site in the area during a three-year period.
- **Nonattainment.** A pollutant is in nonattainment if there was at least one violation of an AAQS for that pollutant in the area.
    - Nonattainment/Transitional. A subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the AAQS for that pollutant.

The attainment status for the SoCAB is shown in Table 5.2-2, *Attainment Status of Criteria Pollutants in the South Coast Air Basin*.

Table 5.2-2 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Federal Standard
Ozone – 8-hour	Extreme Nonattainment	Extreme Nonattainment
PM_{10}	Serious Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Nonattainment (Los Angeles County only)[1]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB 2015.
[1] In 2010, the Los Angeles portion of the SoCAB was designated nonattainment for lead under the new 2008 federal AAQS as a result of large industrial emitters. Remaining areas in the SoCAB are unclassified.

Regional Air Quality Historic Trends

As stated, the SCAQMD is the agency responsible for improving air quality in the SoCAB and achieving the National and California AAQS. The SCAQMD prepares AQMPs that details regional programs to attain the AAQS. While the SoCAB may still be in nonattainment for ozone, particulate matter, and lead (Los Angeles County), air quality for the region has generally improved since the 1970s (see Appendix C1 for further details). In general, concentrations of ozone, NO_X, VOC, CO, PM_{10}, and $PM_{2.5}$ have been decreasing in the SoCAB although population and employment within the SoCAB have increased. The reduction in ozone, NO_X, VOC, and CO concentrations have been primarily a result of motor vehicle controls and reductions in evaporative emissions. Ozone concentrations within the SoCAB are approximately one-third of the concentrations in the late 1970s. The 24-hour national average for PM_{10} decreased by approximately 45 percent between years 1989 to 2014 while the national 24-hour $PM_{2.5}$ average decreased by approximately 52 percent from 1999 to 2014. Concentrations of CO within the SoCAB decreased by more than 80 percent since 1986. The overall improvements in regional air quality have coincided with the creation of SCAQMD and preparation of the AQMPs in addition to the regulations at the state and federal levels.

Multiple Air Toxics Exposure Study IV

The Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study on ambient concentrations of TACs and estimated the potential health risks from air toxics in the SoCAB. In 2008, SCAQMD conducted its third update to the MATES study (MATES III). The results showed that the overall basinwide risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for 84 percent of the cancer risk (SCAQMD 2008a).

SCAQMD recently released the fourth update (MATES IV). The results showed that the overall monitored basinwide risk for excess cancer from a lifetime exposure to ambient levels of air toxics was approximately 418 in one million, a decrease of approximately 57 percent. Compared to the 2008 MATES III, monitored excess cancer risks decreased by approximately 65 percent. Approximately 90 percent of the risk is attributed to mobile sources, and 10 percent is attributed to stationary sources, such as refineries, metal processing facilities, gas stations, and chrome-plating facilities. The largest contributor to this risk was diesel exhaust, accounting for approximately 68 percent of the air toxics risk. Compared to MATES III, MATES IV found substantial improvement in air quality and associated decrease in air toxics exposure. (SCAQMD 2015a).

The Office of Environmental Health Hazard Assessment updated the guidelines for estimating cancer risks on March 6, 2015. The new method uses higher estimates of cancer potency during early life exposures, which result in a higher calculation of risk. There are also differences in the assumptions on breathing rates and length of residential exposures. SCAQMD estimates that risks for a given inhalation exposure level will be about 2.7 times higher using the proposed updated methods from MATES IV (e.g., 2.7 times higher than 418 in one million overall excess cancer risk) (SCAQMD 2015a).

Existing Ambient Air Quality

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site and project area are best documented by measurements made by SCAQMD. The project site is in Source

Receptor Area (SRA) 9, the East San Gabriel Valley. The air quality monitoring station in SRA 9 closest to the project is the Azusa Monitoring Station. Because this station does not monitor SO_2, the analysis uses data from the Los Angeles-North Main Street Monitoring Station. Data from these stations are summarized in Table 5.2-3, *Ambient Air Quality Monitoring Summary*. The data show that the area regularly exceeds the state and federal eight-hour O_3 standards and occasionally exceeds the state one-hour standard. The state PM_{10} and federal $PM_{2.5}$ standards are also regularly exceeded. The CO, SO_2, and NO_2 standards have not been exceeded in the last five years in the project vicinity.

Table 5.2-3 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels during Such Violations				
	2011	2012	2013	2014	2015
Ozone (O3)[1]					
State 1-Hour ≥ 0.09 ppm	13	18	7	11	21
State 8-hour ≥ 0.07 ppm	19	20	15	20	28
Federal 8-Hour > 0.075 ppm	12	10	6	11	17
Max. 1-Hour Conc. (ppm)	0.111	0.0134	0.115	0.123	0.122
Max. 8-Hour Conc. (ppm)	0.092	0.095	0.085	0.092	0.096
Carbon Monoxide (CO)[1]					
State 8-Hour > 9.0 ppm	0	0	*	*	*
Federal 8-Hour ≥ 9.0 ppm	0	0	*	*	*
Max. 8-Hour Conc. (ppm)	1.36	1.13	*	*	*
Nitrogen Dioxide (NO_2)[1]					
State 1-Hour ≥ 0.18 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppb)	0.0795	0.0718	0.0768	0.0702	0.0710
Sulfur Dioxide (SO_2)[2]					
State 24-Hour ≥ 0.04 ppm	0	0	0	*	*
Max. 24-Hour Conc. (ppm)	0.002	0.002	0.002	*	*
Coarse Particulates (PM_{10})[1]					
State 24-Hour > 50 µg/m^3	8	6	6	21	12
Federal 24-Hour > 150 µg/m^3	0	0	0	0	0
Max. 24-Hour Conc. (µg/m^3)	65	78	76	96	101
Fine Particulates ($PM_{2.5}$) [1]					
Federal 24-Hour > 35 µg/m^3	2	0	0	0	2
Max. 24-Hour Conc. (µg/m^3)	94.6	39.6	29.6	32.4	70.3

Source: CARB 2016b.
Notes: ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter
* Data not available.
[1] Data from the Azusa Monitoring Station in Azusa.
[2] Data from the Los Angeles-North Main Street Monitoring Station in Los Angeles.

Existing Emissions

The City of Hope campus consists of hospital, office, hospitality, limited residential, commercial, and industrial land uses. These uses currently generate criteria air pollutant emissions from natural gas use for energy, heating and cooking; vehicle trips associated with each land use; and area sources such as landscaping

equipment and consumer cleaning products. Table 5.2-4, *Existing City of Hope Daily Emissions Inventory*, shows the average daily emissions inventory currently generated by City of Hope.

Table 5.2-4 Existing City of Hope Daily Emissions Inventory

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<	1	1
Transportation[1]	45	219	698	2	133	37
Total	**83**	**237**	**715**	**2**	**135**	**39**
Stationary Equipment						
Central Utilities Plant[2]	*3*	*46*	*34*	*<1*	*3[3]*	*3[3]*

Source: CalEEMod 2016.3.1.

Notes: Based on highest winter or summer emissions using 2016 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of Interstate 210 west of interstate 605 (Caltrans 2016).

2 Emissions are shown for information purposes and are from SCAQMD reporting system, City of Hope Medical Center (Facility ID 23194). Per CalEEMod methodology, emissions associated with boilers in the Energy sector are based on building energy demand and are encompassed within the total Energy sector emissions shown. In addition, emissions from permitted stationary equipment such as installed in the central utilities plant (e.g., boilers) are controlled through the SCAQMD permitting process.

3 PM emissions are shown as PM_{10}. $PM_{2.5}$ fraction of PM_{10} is assumed at 99 percent (SCAQMD 2006).

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases.

Residential areas are also considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Other sensitive receptors include retirement facilities, hospitals, and schools. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial, commercial, retail, and office areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, because the majority of the workers tend to stay indoors most of the time. In addition, the workforce is generally the healthiest segment of the population.

The nearest off-site sensitive receptors are the residences to the north across Duarte Road and the adjacent residences to the west as well as Beardslee Elementary School to the west across Buena Vista Street. In addition to the off-site sensitive receptors, existing sensitive receptors on-site consist of City of Hope patients.

5.2.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

AQ-1 Conflict with or obstruct implementation of the applicable air quality plan.

AQ-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

AQ-3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

AQ-4 Expose sensitive receptors to substantial pollutant concentrations.

AQ-5 Create objectionable odors affecting a substantial number of people.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold AQ-5: Future development, revitalization, and/or redevelopment activities that would be accommodated by the Campus Plan would not emit objectionable odors that would affect a substantial number of people.

This impact will not be addressed in the following analysis.

5.2.2.1 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

The analysis of the proposed project's air quality impacts follows the guidance and methodologies recommended in SCAQMD's *CEQA Air Quality Handbook* and the significance thresholds on SCAQMD's website.[6] CEQA allows the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. SCAQMD has established thresholds of significance for regional air quality emissions for construction activities and project operation. In addition to the daily thresholds listed above, projects are also subject to the AAQS. These are addressed through an analysis of localized CO impacts and localized significance thresholds (LSTs).

Regional Significance Thresholds

SCAQMD has adopted regional construction and operational emissions thresholds to determine a project's cumulative impact on air quality in the SoCAB, shown in Table 5.2-5, *SCAQMD Regional Significance Thresholds*. The table lists thresholds that are applicable for all projects uniformly, regardless of size or scope. There is growing evidence that although UFPs contribute a very small portion of the overall atmospheric mass

[6] SCAQMD's Air Quality Significance Thresholds are current as of March 2011 and can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook.

concentration, they represent a greater proportion of the health risk from PM. However, the EPA and CARB have not adopted AAQS to regulate UFPs; therefore, SCAQMD has not developed thresholds for them.

Table 5.2-5 SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROGs)/Volatile Organic Compounds (VOCs)	75 lbs/day	55 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day
Particulates ($PM_{2.5}$)	55 lbs/day	55 lbs/day

Source: SCAQMD 2015b.

Projects that exceed the regional significance threshold contribute to the nonattainment designation of the SoCAB. The attainment designations are based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health effects. Exposure to fine particulate pollution and ozone causes myriad health impacts, particularly to the respiratory and cardiovascular systems:

- Increases cancer risk ($PM_{2.5}$, TACs)
- Aggravates respiratory disease (O_3, $PM_{2.5}$)
- Increases bronchitis (O_3, $PM_{2.5}$)
- Causes chest discomfort, throat irritation, and increased effort to take a deep breath (O_3)
- Reduces resistance to infections and increases fatigue (O_3)
- Reduces lung growth in children ($PM_{2.5}$)
- Contributes to heart disease and heart attacks ($PM_{2.5}$)
- Contributes to premature death (O_3, $PM_{2.5}$)
- Contributes to lower birth weight in newborns ($PM_{2.5}$) (SCAQMD 2015c)

Exposure to fine particulates and ozone aggravates asthma attacks and can amplify other lung ailments such as emphysema and chronic obstructive pulmonary disease. Exposure to current levels of $PM_{2.5}$ is responsible for an estimated 4,300 cardiopulmonary-related deaths per year in the SoCAB. In addition, University of Southern California scientists, in a landmark children's health study, found that lung growth improved as air pollution declined for children aged 11 to 15 in five communities in the SoCAB (SCAQMD 2015d).

Mass emissions in Table 5.2-5 are not correlated with concentrations of air pollutants but contribute to the cumulative air quality impacts in the SoCAB. Therefore, regional emissions from a single project do not single-handedly trigger a regional health impact, and it is speculative to identify how many more individuals in the air basin would be affected by the health effects listed above. In addition, the analysis to determine how exceeding the regional thresholds would affect the number of days the region is in nonattainment is within the scope of the AQMP. SCAQMD is the primary agency responsible for ensuring the health and welfare of

sensitive individuals exposed to elevated concentrations of air pollutants in the SoCAB. To achieve the health-based standards established by the EPA, SCAQMD prepares an AQMP that details regional programs to attain the AAQS.

Localized Significance Thresholds

SCAQMD identifies localized significance thresholds, shown in Table 5.2-6, *SCAQMD Localized Significance Thresholds*. Emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at a project site (offsite mobile-source emissions are not included in the LST analysis) could expose sensitive receptors to substantial concentrations of criteria air pollutants. A project that generates emissions that trigger a violation of the AAQS when added to the local background concentrations would generate a significant impact.

Table 5.2-6 SCAQMD Localized Significance Thresholds

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO_2 Standard (CAAQS)	0.18 ppm
Annual NO_2 Standard (CAAQS)	0.03 ppm
24-Hour PM_{10} Standard – Construction (SCAQMD)[1]	10.4 µg/m^3
24-Hour $PM_{2.5}$ Standard – Construction (SCAQMD)[1]	10.4 µg/m^3
24-Hour PM_{10} Standard – Operation (SCAQMD)[1]	2.5 µg/m^3
24-Hour $PM_{2.5}$ Standard – Operation (SCAQMD)[1]	2.5 µg/m^3
Annual Average PM_{10} Standard (SCAQMD)[1]	1.0 µg/m^3

Source: SCAQMD 2015b.
ppm = parts per million; µg/m^3 = micrograms per cubic meter
[1] Threshold is based on SCAQMD Rule 403. Since the SoCAB is in nonattainment for PM_{10} and $PM_{2.5}$, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

To assist lead agencies, SCAQMD developed screening-level LSTs to back-calculate the mass amount (lbs. per day) of emissions generated onsite that would trigger the levels shown in Table 5.2-6 for projects under five acres. Screening-level LSTs are based on the ambient concentrations of that pollutant within the project SRA and the distance to the nearest sensitive receptor. Screening-level LST analyses are the localized significance thresholds for all projects of five acres and less; however, they can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required to compare concentrations of air pollutants generated by the project to the localized concentrations shown in Table 5.2-6.

The construction screening-level LSTs in SRA 9 are shown in Table 5.2-7, *SCAQMD Screening-Level Localized Significance Thresholds*. For construction activities, LSTs are based on the acreage disturbed per day based on equipment use (SCAQMD 2011). The different types of construction activities would require different equipment mixes, resulting in multiple LSTs. Because the proposed project is not an industrial project that has the potential to emit substantial sources of stationary emissions, operational LSTs are not an air quality impact of concern, but they are shown in Table 5.2-7 for reference.

Table 5.2-7 SCAQMD Screening-Level Localized Significance Thresholds

Acreage Disturbed	Threshold (lbs/day)			
	Nitrogen Oxides (NO_X)	Carbon Monoxide (CO)	Coarse Particulates (PM_{10})	Fine Particulates ($PM_{2.5}$)
Construction[1]				
Phases I and II[1]				
=>1-Acre LSTs	89	623	5	3
1.31-Acre LSTs	101	726	6	4
3.50-Acre LSTs	165	1,343	10.49	6.50
4.00-Acre LSTs	178	1,473	12	7
Phase 3[2]				
=>1-Acre LSTs	89	623	5	3
1.31-Acre LSTs	101	726	6	4
3.50-Acre LSTs	165	1,343	10	6
4.00-Acre LSTs	178	1,473	12	7
Phase 4[2]				
=>1-Acre LSTs	89	623	5	3
1.31-Acre LSTs	101	726	6	4
3.50-Acre LSTs	165	1,343	10	6
4.00-Acre LSTs	178	1,473	12	7
Operation[2]				
=>5-Acre Area	371	1,965	4	2

Source: SCAQMD 2008b and SCAQMD 2011; Based on receptors in SRA 9.
[1] LSTs are based on receptors within 82 feet (25 meters).
[2] LSTs are based on receptors within 82 feet (25 meters) and a 5-acre project site.

CO Hotspots

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SoCAB and the state have steadily declined.

Health Risk Analysis

Whenever a project would use chemical compounds identified in SCAQMD Rule 1401, on CARB's air toxics list pursuant to AB 1807, or on the EPA's National Emissions Standards for Hazardous Air Pollutants, a health risk assessment is required by the SCAQMD. Table 5.2-8, *SCAQMD Toxic Air Contaminants Incremental Risk Thresholds*, lists the SCAQMD's TAC incremental risk thresholds for operation of a project. Projects that do not generate emissions that exceed the values in Table 5.2-8 would not substantially contribute to cumulative air quality hazards or exacerbate an existing environmental hazard. Residential, commercial, office,

and institutional uses (such as the hospital land uses) do not use substantial quantities of TACs and typically do not exacerbate existing hazards. Therefore, these thresholds are typically applied to new industrial projects and are not required to be applied to the proposed project.

Table 5.2-8 SCAQMD Toxic Air Contaminants Incremental Risk Thresholds

Maximum Incremental Cancer Risk	≥ 10 in 1 million
Cancer Burden (in areas ≥ 1 in 1 million)	> 0.5 excess cancer cases
Hazard Index (project increment)	≥ 1.0

Source: SCAQMD 2015b.

Per the Office of Environmental Health Hazard Assessment (OEHHA) guidelines, projects lasting for longer than two months may be evaluated for potential health risks to surrounding receptors. The determination of health risks in a Health Risk Assessment (HRA) required the calculation of 70-year average to determine individual lifetime cancer risks. OEHHA guidelines also stated that HRAs should be based on an age factor exposure period; however, such assessments should be limited to the period and duration of activities associated with the subject project. For the proposed project, construction activities are anticipated to occur over an approximately 18-year period. For purposes of this analysis, the SCAQMD significance thresholds for operational related health risk impacts, as shown in Table 5.2-8, are utilized for analyzing construction impacts.

5.2.3 Environmental Impacts

Methodology

This air quality evaluation was prepared in accordance with the requirements of CEQA to determine if significant air quality impacts are likely to occur in conjunction with implementation of the proposed project. SCAQMD has published the *CEQA Air Quality Handbook* (Handbook) and updates on its website to provide local governments with guidance for analyzing and mitigating project-specific air quality impacts. The Handbook provides standards, methodologies, and procedures for conducting air quality analyses in environmental impact reports and was used extensively in the preparation of this analysis. The SCAQMD has published additional guidance—*Localized Significance Threshold Methodology for CEQA Evaluations* (SCAQMD 2008c)—for evaluating localized effects from emissions generated by a project. This document was also used in the preparation of this analysis.

The analysis also makes use of the CalEEMod, Version 2016.3.1, for determination of daily construction and operational emissions, which are based on the following:

- **Transportation:** Based on the annual average trip generation and vehicle miles traveled data provided by Fehr & Peers (see Appendix J1 of this DEIR). For purposes of this analysis, an average trip distance of 14.3 miles per trip is used for both the existing and project buildout scenarios. Based on the estimated 11,903 average daily trips generated under existing conditions and the 16,645 average daily trips generated

under full buildout conditions, approximately 170,213 vehicle miles per day are generated currently, and 238,024 vehicle miles per day would be generated under full buildout conditions (Fehr & Peers 2016).

- **Area Sources:** Area and stationary sources are based on the CalEEMod defaults for emissions generated from use of consumer products and cleaning supplies (based on building square footage) and for the VOC-content in paints used for architectural coatings.

- **Energy:** Criteria air pollutant emissions from energy use (natural gas used for cooking, heating, etc.) are based on the CalEEMod defaults for natural gas usage by nonresidential land uses. For purposes of this analysis, new buildings are assumed to comply with the 2016 Building Energy Efficiency Standards, which are 5 percent more energy efficient for nonresidential buildings than the 2013 Building Energy Efficiency Standards. Existing buildings are assumed to comply with the 2005 Building Energy Efficiency Standards.

- **Stationary Sources:** Per CalEEMod methodology, emissions associated with operation of boilers are encompassed within the energy sector emissions associated with the buildings. Moreover, specific planned future improvements to the City of Hope central utilities plant are currently unknown and speculative. However, for purposes of this analysis, emissions from the potential installation of two new boilers are included for informational purposes only and are not additive to the overall total operational-phase emissions. While two new emergency generators could also be installed, operation of an emergency generator would only occur during emergencies and periodic testing and its operation would be minimal overall. Additionally, stationary sources of emissions such as boilers and generators would be subject to CEQA and future discretionary action by SCAQMD per SCAQMD Regulation XIII, New Source Review. The daily and heat annual inputs are based on data provided for the three existing boilers in operation at the City of Hope central utilities plant. Boiler emissions are based on the following:

  - Boilers:
    - Fuel Type: Compressed natural gas
    - Boiler Rating: 4 MMBtu per hour
    - Daily Heat Input Per Boiler: 131.79 MMBtu per day
    - Annual Heat Input Per Boiler: 49,003 MMBtu per year

- **Construction:** Construction emissions are based on the construction information provided by the applicant. Where specific information was not available, construction assumptions were based on CalEEMod defaults such as construction equipment mix and worker, vendor, and haul trips. For purposes of this analysis, it is assumed that the proposed project would be developed in four phases, beginning January 2018, with buildout in 2035. Construction details for each development phase are as follows:

  - **Phase 1:** For purposes of this analysis, Phase 1 is anticipated to begin construction at the start of 2018 and be completed by the end of 2021. Under this development phase, approximately 98,000 square feet of existing hospital, medical office, and research and development buildings would be demolished, and up to 520,000 building square feet of hospital, medical office, and research buildings

would be built. A parking structure with up to 1,750 parking spaces would also be constructed as well as a new surface parking lot. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-9, *Phase 1 Construction Activities, Phasing, and Equipment*.

Table 5.2-9 Phase 1: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2018-3/23/2018	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/24/2018-5/4/2018	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/7/2018-7/27/2018	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	7/28/2018-1/22/2021	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	7/28/2019-12/24/2021	1 air compressor
Asphalt Paving	1/23/2021-3/19/2021	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

- **Phase 2:** This phase is anticipated to commence in 2021 and be completed in the first quarter of 2025. Approximately 107,000 building square feet of existing medical office, research and development, hospitality, industrial, and warehouse space would be demolished, and approximately 210,000 building square feet of new hospital, 61,000 building square feet of research and development, and 20,000 building square feet of industrial space would be built. A new proposed parking structure with up to 1,250 parking spaces as well as new surface parking lots would also be constructed. Additionally, for purposes of this analysis, it is assumed a new boiler and emergency generator could potentially be installed at the existing City of Hope central utilities plant during this development phase, subject to SCAQMD Regulation XIII, New Source Review. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-10, *Phase 2 Construction Activities, Phasing, and Equipment*.

Table 5.2-10 Phase 2: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2021-3/25/2021	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/26/2021-5/20/2021	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/21/2021-8/12/2021	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	8/13/2021-1/23/2025	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	8/13/2022-12/26/2025	1 air compressor
Asphalt Paving	1/24/2025-4/17/2025	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

- **Phase 3:** Phase 3 is anticipated to begin in 2026 and be completed in 2030. Under this phase, approximately 153,500 building square feet of hospital, medical office, hospitality, warehouse, housing, and assembly buildings would be demolished, and approximately 180,000 building square feet of hospital, 70,000 building square feet of medical office, 75,000 building square feet of hospitality, 10,000 building square feet of industrial, and a 30,000-square-foot data center would be constructed as well as a surface parking lot. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-11, *Phase 3 Construction Activities, Phasing, and Equipment*.

Table 5.2-11 Phase 3: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2026-3/25/2026	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/26/2026-5/20/2026	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/21/2026-8/12/2026	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	8/13/2026-1/23/2030	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	8/13/2027-12/26/2030	1 air compressor
Asphalt Paving	1/24/2030-4/17/2030	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

- **Phase 4:** Development of Phase 4 is anticipated to begin in 2031 and be built out by 2035. Approximately 29,000 building square feet of research and development building space would be demolished, and 120,000 building square feet of medical office and 130,000 building square feet of research and development space would be built as well as a new surface parking lot. In addition, for purposes of this analysis, another new boiler and emergency generator in addition to the new boiler and emergency generator assumed for Phase 2 could potentially be installed at the existing City of Hope central utilities plant during this development phase, subject to SCAQMD Regulation XIII, New Source Review. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-12, *Phase 4 Construction Activities, Phasing, and Equipment*.

Table 5.2-12 Phase 4: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2031-3/25/2031	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/26/2031-5/20/2031	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/21/2031-8/12/2031	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	8/13/2031-1/23/2035	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	8/13/2032-12/27/2035	1 air compressor
Asphalt Paving	1/24/2035-4/14/2035	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

The construction HRA prepared for the proposed project (Appendix C2 of this DEIR) was based on conservative (i.e., health protective) assumptions to ensure that estimated risks do not underestimate actual risks. The HRA is based on OEHHA guidelines to produce conservative estimates of cancer risk posed by exposure to construction diesel particulate matter (DPM).

For this residential-based risk assessment, the following conservative assumptions were used:

- It was assumed that maximum-exposed residential receptors (both children and adults) stood outdoors and are subject to DPM at their residence for 8 hours per day, and approximately 260 construction days per year. As a conservative measure, the SCAQMD does not recognize indoor adjustments for receptors. However, California residents typically spend on average 2 hours per day outdoors at their residences and their remaining time indoors (USEPA 2011). This would result in lower exposures to construction related DPM emissions and lower estimated risk values.

- The calculated risk for infants from third trimester to age 2, children aged 2 to 16 years, and those aged 16 to 30 are multiplied by age sensitivity factors of 10, 3, and 1, respectively, to account for early life exposure and uncertainty in child versus adult exposure impacts (OEHHA 2015).

For this elementary school-based risk assessment, the following conservative assumptions were used:

- It was assumed that maximum-exposed students stood outdoors and are subject to DPM at the school for 8 hours per day, 250 days per year (work days; OEHHA 2004). In reality, children are exposed to outdoor pollutant concentration levels for a portion of the day and are exposed to reduced indoor pollutant concentrations for the remaining school hours. This would result in lower estimated risk values.

- The calculated risk for children from 2 to 16 years is multiplied by an age sensitivity factor of 3 to account for early life exposure and uncertainty in child versus adult exposure impacts (OEHHA 2015).

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.2-1: The proposed project would be consistent with the South Coast Air Quality Management District's Air Quality Management Plan. [Threshold AQ-1]

Impact Analysis: SCAQMD is directly responsible for reducing emissions from area, stationary, and mobile sources in the SoCAB to achieve the National and California AAQS. SCAQMD has responded to this requirement by preparing an AQMP. On March 3, 2017 the SCAQMD Governing Board adopted the 2016 AQMP, which is a regional and multiagency effort (SCAQMD, CARB, SCAG, and EPA). A consistency determination with the AQMP plays an important role in local agency project review by linking local planning and individual projects to the AQMP. It fulfills the CEQA goal of informing decision makers of the environmental efforts of the project under consideration early enough to ensure that air quality concerns are fully addressed. It also provides the local agency with ongoing information as to whether they are contributing to the clean air goals in the AQMP.

The two principal criteria for conformance with an AQMP are:

1. Whether the project would exceed the assumptions in the AQMP.

2. Whether the project would result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timeline attainment of air quality standards.

SCAG is SCAQMD's partner in the preparation of the AQMP, providing the latest economic and demographic forecasts and developing transportation measures. Regional population, housing, and employment projects developed by SCAG are based in part on a city's general plan land use designations. These projections form the foundation for the emissions inventory of the AQMP and are incorporated into the regional transportation plan/sustainable communities strategy prepared by SCAG to determine priority transportation projects and vehicle miles traveled in the SCAG region. Because the AQMP strategy is based on projections from local general plans, projects that are consistent with the local general plan are considered consistent with the air quality-related regional plan. Additionally, only large projects have the potential to substantially affect the demographic forecasts in the AQMP.

CEQA Guidelines Section 15206(b) states that a proposed project is of statewide, regional, or area-wide significance if the project is a residential development of more than 500 dwelling units or a commercial office building of 250,000 square feet or more or that employs 1,000 or more employees. The proposed project would introduce a net of approximately 1,038,500 square feet of new medical campus buildings (excludes the two planned parking structures) in addition to 2,841 new jobs. These numbers would exceed the standards determining whether a project is of statewide, regional, or area-wide significance, but any growth associated with the proposed project in regard to households would be within the assumed SCAG growth projections for the cities of Duarte and Irwindale (see Impact 5.11-1, Section 5.11, *Population and Housing*, of this DEIR). Thus, implementation of the proposed project would not have the potential to substantially affect SCAG's demographic projections beyond what is already anticipated for the area.

With respect to the second criterion, the analyses for Impact 5.2-3 demonstrate that the proposed project would not generate long-term emissions of criteria air pollutants that would exceed SCAQMD's regional operation-phase significance thresholds, which were established to determine whether a project has the potential to cumulatively contribute to the SoCAB's nonattainment designations. Thus, the proposed project would not result in an increase in the frequency or severity of existing air quality violations; cause or contribute to new violations; or delay timely attainment of the AAQS. Therefore, overall, the proposed project would be considered consistent with the AQMP, and impacts would be less than significant.

Impact 5.2-2: Construction activities associated with the proposed project would not generate short-term emissions in exceedance of SCAQMD'S regional threshold criteria. [Thresholds AQ-2 and AQ-3]

Impact Analysis: At full buildout, the proposed project would develop approximately 670,000 building square feet of hospital, 250,000 building square feet of medical office, 371,000 building square feet of research and development, 75,000 building square feet of hospitality, and 30,000 building square feet of industrial space in addition to a 30,000-square-foot data center, two parking structures, and surface lots.

5. Environmental Analysis
AIR QUALITY

Construction activities associated with the proposed project would produce combustion emissions from various sources, such as onsite heavy-duty construction vehicles, vehicles hauling materials to and from the site, and motor vehicles transporting the construction crew. Site preparation activities produce fugitive dust emissions (PM_{10} and $PM_{2.5}$) from soil-disturbing activities, such as grading and excavation. Air pollutant emissions from construction activities onsite would vary daily as construction activity levels change. Table 5.2-13, *Maximum Daily Regional Construction Emissions by Development Phase*, shows the construction emissions for the proposed project. As shown in the table, project-related construction emissions would not exceed the SCAQMD regional construction significance thresholds. Therefore, construction-related regional air quality impacts would be less than significant.

Table 5.2-13 Maximum Daily Regional Construction Emissions by Development Phase

Construction Phase(s)	Criteria Air Pollutants (pounds per day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Phase 1 and Phase 2						
Year 2018						
Phase 1 Demolition	4	43	24	<1	4	2
Phase 1 Site Preparation	5	49	24	<1	11	7
Phase 1 Grading	6	77	40	<1	7	4
Phase 1 Building Construction	7	56	57	<1	9	4
Year 2019						
Phase 1 Building Construction	7	52	53	<1	9	3
Phase 1 Building Construction and Architectural Coating Overlap	16	54	60	<1	10	4
Year 2020						
Phase 1 Building Construction and Architectural Coating Overlap	15	50	56	<1	10	4
Year 2021						
Phase 1 Building Construction and Architectural Coating Overlap	14	45	53	<1	10	3
Phase 1 Building Construction, Architectural Coating, and Phase 2 Demolition Overlap	18	81	76	<1	13	5
Phase 1 Architectural Coating, Paving, and Phase 2 Demolition Overlap	14	51	45	<1	6	3
Phase 1 Architectural Coating and Phase 2 Site Preparation Overlap	13	43	28	<1	11	7
Phase 1 Architectural Coating and Phase 2 Grading Overlap	13	55	40	<0	8	4
Phase 1 Architectural Coating and Phase 2 Building Construction Overlap	13	36	42	<1	7	3
Year 2022						
Phase 2 Building Construction	4	31	34	<1	6	2
Phase 2 Building Construction and Architectural Coating Overlap	8	33	39	<1	7	2

Table 5.2-13 Maximum Daily Regional Construction Emissions by Development Phase

Construction Phase(s)	Criteria Air Pollutants (pounds per day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2023						
Phase 2 Building Construction and Architectural Coating Overlap	7	28	37	<1	6	2
Year 2024						
Phase 2 Building Construction and Architectural Coating Overlap	7	27	36	<1	6	2
Year 2025						
Phase 2 Building Construction and Architectural Coating Overlap	7	26	35	<1	6	2
Phase 2 Architectural Coating and Paving Overlap	5	10	19	<1	1	1
Maximum Daily Emissions	18	81	76	<1	13	7
SCAQMD Regional Construction Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No
Phase 3						
Year 2026						
Phase 3 Demolition	2	21	21	<1	2	1
Phase 3 Site Preparation	3	25	18	<1	9	5
Phase 3 Grading	3	28	27	<1	5	3
Phase 3 Building Construction	2	17	22	<1	3	1
Year 2027						
Phase 3 Building Construction	2	17	21	<1	3	1
Phase 3 Building Construction and Architectural Coating Overlap	6	19	24	<1	3	1
Year 2028						
Phase 3 Building Construction and Architectural Coating Overlap	6	19	24	<1	3	1
Year 2029						
Phase 3 Building Construction and Architectural Coating Overlap	6	19	23	<1	3	1
Year 2030						
Phase 3 Building Construction and Architectural Coating Overlap	6	14	23	<1	2	1
Phase 3 Architectural Coating and Paving Overlap	6	8	19	<1	1	<1
Maximum Daily Emissions	6	29	27	<1	9	5
SCAQMD Regional Construction Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No
Phase 4						
Year 2031						
Phase 4 Demolition	2	11	20	<1	2	1
Phase 4 Site Preparation	2	14	17	<1	8	5
Phase 4 Grading	3	14	24	<1	4	2
Phase 4 Building Construction	2	11	19	<1	2	1

Table 5.2-13 Maximum Daily Regional Construction Emissions by Development Phase

Construction Phase(s)	Criteria Air Pollutants (pounds per day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2032						
Phase 4 Building Construction	2	11	19	<1	2	1
Phase 4 Building Construction and Architectural Coating Overlap	5	12	21	<1	2	1
Year 2033						
Phase 4 Building Construction and Architectural Coating Overlap	4	12	21	<1	2	1
Year 2034						
Phase 4 Building Construction and Architectural Coating Overlap	4	12	21	<1	2	1
Year 2035						
Phase 4 Building Construction and Architectural Coating Overlap	4	11	21	<1	2	1
Phase 4 Architectural Coating and Paving Overlap	4	6	18	<1	1	<1
Maximum Daily Emissions	5	14	24	<1	8	5
SCAQMD Regional Construction Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No

Source: CalEEMod Version 2016.3.1. Highest winter or summer emissions are reported.
[1] Based on information provided by the applicant. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults.
[2] Includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.

Impact 5.2-3: Long-term operation of the project would not generate additional emissions in exceedance of SCAQMD's regional significance thresholds. [Thresholds AQ-2 and AQ-3]

Impact Analysis: The following evaluates operation-related impacts associated with each phase of development—Phases I through IV. Development of each phase of the City of Hope Campus Plan would result in direct and indirect criteria air pollutant emissions from transportation, energy (e.g., natural gas use), and area sources (e.g., aerosols and landscaping equipment). Mobile-source criteria air pollutant emissions are based on the traffic analysis conducted by Fehr & Peers (see Appendix J1 of this DEIR).

Phase 1

Phase 1 of the project would result in an overall net decrease of 920 average daily trips and 13,156 vehicle miles per day (see Appendix J1) compared to existing conditions. The results of the CalEEMod modeling are shown in Table 5.2-14, *Phase 1: Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings subtracted by the emissions associated with the existing buildings proposed to be demolished. Furthermore, the net change in emissions is also attributed to the net change in vehicle trips. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds.

Table 5.2-14 Phase 1: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Existing (Year 2021)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	27	145	428	2	132	36
Total	**66**	**163**	**445**	**2**	**133**	**37**
Project[1]						
Area	46	<1	1	<1	<1	<1
Energy	2	23	19	<1	2	2
Transportation[2]	25	134	396	1	122	33
Total	**74**	**157**	**416**	**2**	**124**	**35**
Net Change (Project – Existing)						
Net Change	**8**	**(-6)**	**(-29)**	(-<1)	**(-10)**	**(-3)**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.
[1] It is assumed that approximately 98,000 building square feet of the existing City of Hope structures would be demolished.
[2] Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).

Phase 2

Phase 2 of the project would generate a net increase of 641 average daily trips and 9,166 vehicle miles per day (see Appendix J1). The results of the CalEEMod modeling are shown in Table 5.2-15, *Phase 2: Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings and the additional vehicle trips associated with the additional visitors, patients, and employees subtracted by the emissions associated with the existing buildings proposed to be demolished. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds.

Table 5.2-15 Phase 2: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Existing (Year 2025)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	21	93	334	1	131	36
Total	**60**	**111**	**352**	**1**	**133**	**37**
Project[1]						
Area	50	<1	1	<1	<1	<1
Energy[2]	3	26	22	<1	2	2

Table 5.2-15 Phase 2: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Transportation[3]	22	99	353	1	139	38
Total	**76**	**125**	**376**	**2**	**141**	**40**
Net Change (Project – Existing)						
Net Change	**16**	**14**	**25**	<1	**8**	**2**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
New Potential Stationary Sources						
Central Utilities Plant – Boilers[4]	*1*	*1*	*13*	*<1*	*1*	*1*

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 It is assumed that approximately 107,000 building square feet of the existing City of Hope structures would be demolished.

2 Per CalEEMod methodology, emissions associated with any additional boilers needed for additional heating for the new facilities are accounted in the Energy sector. Emissions in this sector represent emissions associated with building energy use.

3 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).

4 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Phase 3

Phase 3 of the project would generate a net increase of 2,572 average daily trips and 36,779 vehicle miles per day (see Appendix J1). The results of the CalEEMod modeling are shown in Table 5.2-16, *Phase 3: Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings and the additional vehicle trips associated with the additional visitors, patients, and employees subtracted by the emissions associated with the existing buildings proposed to be demolished. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds.

Table 5.2-16 Phase 3: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Existing (Year 2030)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	18	82	269	1	131	35
Total	**56**	**100**	**286**	**1**	**133**	**37**
Project[1]						
Area	55	<1	1	<1	<1	<1
Energy[2]	3	28	24	<1	2	2
Transportation[3]	21	100	328	1	160	43

Table 5.2-16 Phase 3: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Total	**80**	**129**	**353**	**2**	**162**	**45**
Net Change (Project – Existing)						
Net Change	**24**	**29**	**67**	<1	**29**	**8**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
New Potential Stationary Sources						
Central Utilities Plant – Boilers[4]	*1*	*1*	*13*	*<1*	*1*	*1*

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

[1] It is assumed that approximately 153,500 building square feet of the existing City of Hope structures would be demolished.

[2] Per CalEEMod methodology, emissions associated with any additional boilers needed for additional heating for the new facilities are accounted in the Energy sector. Emissions in this sector represent emissions associated with building energy use.

[3] Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).

[4] Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Phase 4 (Full Buildout)

Full buildout of the project would generate a net increase of 4,753 average daily trips and 67,968 vehicle miles per day (see Appendix J1). The results of the CalEEMod modeling are shown in Table 5.2-17, *Phase 4 (Full Buildout): Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings and the additional vehicle trips associated with the additional visitors, patients, and employees subtracted by the emissions associated with the existing buildings proposed to be demolished. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds. Therefore, long-term impacts would be less than significant.

Table 5.2-17 Phase 4 (Full Buildout): Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Existing (Year 2035)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	15	75	227	1	131	35
Total	**54**	**93**	**245**	**1**	**133**	**37**
Project[1]						
Area	60	<1	1	<1	<1	<1
Energy[2]	3	29	25	<1	2	2
Transportation[3]	21	106	319	2	184	49
Total	**84**	**135**	**344**	**2**	**186**	**52**
Net Change (Project – Existing)						
Net Change	**31**	**42**	**100**	1	**53**	**15**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
New Potential Stationary Sources						
Central Utilities Plant – Boilers[4]	*1*	*3*	*25*	*<1*	*2*	*2*

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 It is assumed that approximately 387,500 building square feet of the existing City of Hope structures would be demolished.

2 Per CalEEMod methodology, emissions associated with any additional boilers needed for additional heating for the new facilities are accounted in the Energy sector. Emissions in this sector represent emissions associated with building energy use.

3 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).

4 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Impact 5.2-4: Construction of the proposed project during Phase 1 would exceed the SCAQMD screening-level LST for $PM_{2.5}$ and potentially expose sensitive receptors to substantial pollutant concentrations. [Threshold AQ-4]

Impact Analysis: The proposed project could expose sensitive receptors to elevated pollutant concentrations during construction activities if it would cause or contribute significantly to elevated levels. Unlike the mass of construction and operations emissions shown in the regional emissions analysis in Tables 5.2-13 and 5.2-14, which are described in pounds per day, localized concentrations refer to an amount of pollutant in a volume of air (ppm or $\mu g/m^3$) and can be correlated to potential health effects.

LSTs

The screening-level LSTs are the amount of project-related emissions at which localized concentrations could exceed the ambient air quality standards for criteria air pollutants for which the SoCAB is designated nonattainment. Screening-level LSTs are based on the proposed project site size and distance to the nearest

sensitive receptor. Thresholds are based on the California AAQS, which are the most stringent AAQS, established to provide a margin of safety in the protection of the public health and welfare. They are designed to protect sensitive receptors most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise.

Table 5.2-18, *Maximum Daily Onsite Localized Construction Emissions*, shows the maximum daily construction emissions (pounds per day) generated during onsite construction activities. As shown in the table, maximum daily construction emissions would not exceed the SCAQMD screening-level LSTs for NO_X, CO, or PM_{10}. However, site preparation activities during Phase 1 would result in an exceedance of the LST for $PM_{2.5}$. Therefore, without mitigation, development of the proposed project would result in a potentially significant localized air quality impact and cause an exceedance of the California AAQS.

Table 5.2-18 Maximum Daily Onsite Localized Construction Emissions

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 1 and Phase 2				
Phase 1 Demolition – 2018	38	22	3	2
Phase 1 Architectural Coating and Paving and Phase 2 Demolition Overlap – 2021	50	40	4	3
Phase 2 Paving	10	16	<1	<1
=>1-Acre LSTs[3]	89	623	5	3
Exceeds LSTs?	No	No	No	No
Phase 1 Building Construction – 2018	23	18	1	1
Phase 1 Building Construction – 2019	21	17	1	1
Phase 1 Building Construction and Architectural Coating – 2019	54	41	3	3
Phase 1 Building Construction and Architectural Coating – 2020	52	40	3	3
Phase 1 Building Construction and Architectural Coating – 2021	32	33	2	2
Phase 1 Architectural Coating and Phase 2 Building Construction – 2021	19	18	1	1
Phase 2 Building Construction – 2022	16	15	1	1
Phase 2 Building Construction and Architectural Coating – 2022	17	18	1	1
Phase 2 Building Construction and Architectural Coating – 2023	16	18	1	1
Phase 2 Building Construction and Architectural Coating – 2024	15	18	1	1
Phase 2 Building Construction and Architectural Coating – 2025	14	18	1	1
1.31-Acre LSTs[3]	101	726	6	4
Exceeds LSTs?	No	No	No	No
Phase 1 Site Preparation – 2018	48	22	10.30	**6.62**
3.50-Acre LSTs[3]	165	1,343	10.49	6.50
Exceeds LSTs?	No	No	No	**Yes**
Phase 1 Grading – 2018	60	35	6	4
4.00-Acre LSTs[3]	178	1,473	12	7
Exceeds LSTs?	No	No	No	No

Table 5.2-18 Maximum Daily Onsite Localized Construction Emissions

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 3				
Phase 3 Demolition – 2026	19	19	2	1
Phase 3 Paving – 2030	7	16	<1	<1
=>1-Acre LSTs[3]	89	623	5	3
Exceeds LST?	No	No	No	No
Phase 3 Building Construction – 2026	12	16	1	<1
Phase 3 Building Construction – 2027	12	16	1	<1
Phase 3 Building Construction and Architectural Coating – 2027	14	18	1	1
Phase 3 Building Construction and Architectural Coating – 2028	14	18	1	1
Phase 3 Building Construction and Architectural Coating – 2029	14	18	1	1
Phase 3 Building Construction and Architectural Coating – 2030	9	18	<1	<1
1.31-Acre LSTs[3]	101	726	6	4
Exceeds LST?	No	No	No	No
Phase 3 Site Preparation – 2026	25	18	9	5
3.50-Acre LSTs[3]	165	1,343	10	6
Exceeds LSTs?	No	No	No	No
Phase 3 Grading – 2026	28	26	5	3
4.00-Acre LSTs[3]	178	1,473	12	7
Exceeds LSTs?	No	No	No	No
Phase 4				
Phase 4 Demolition – 2031	10	19	1	<1
Phase 4 Paving – 2035	6	18	<1	<1
=>1-Acre LSTs[3]	89	623	5	3
Exceeds LST?	No	No	No	No
Phase 4 Building Construction – 2031	8	16	<1	<1
Phase 4 Building Construction – 2032	8	16	<1	<1
Phase 4 Building Construction and Architectural Coating – 2032	9	18	<1	<1
Phase 4 Building Construction and Architectural Coating – 2033	9	18	<1	<1
Phase 4 Building Construction and Architectural Coating – 2034	9	18	<1	<1
Phase 4 Building Construction and Architectural Coating – 2035	8	18	<1	<1
1.31-Acre LSTs[3]	101	726	6	4
Exceeds LST?	No	No	No	No
Phase 4 Site Preparation – 2031	14	16	8	5
3.50-Acre LSTs[3]	165	1,343	10	6
Exceeds LSTs?	No	No	No	No

Table 5.2-18 Maximum Daily Onsite Localized Construction Emissions

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 4 Grading – 2031	14	23	4	2
4.00-Acre LSTs[3]	178	1,473	12	7
Exceeds LSTs?	No	No	No	No

Source: CalEEMod 2016.3.1; SCAQMD 2008b; SCAQMD 2011. Highest winter or summer emissions are reported.
[1] Based on the preliminary information provided by the applicant. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults.
[2] Includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.
[3] LSTs are based on receptors within 82 feet (25 meters).

Impact 5.2-5: Project-related construction activities could result in potentially significant cancer risk impacts to nearby off-site residences. [Threshold AQ-4]

Impact Analysis: The proposed project would temporarily elevate concentrations TACs and DPM in the vicinity of sensitive land uses during construction activities. As stated, SCAQMD currently does not require health risk assessments for short-term emissions from construction equipment, which primarily consist of DPM. However, this analysis has been included to conservatively gauge the potential health risk-related impacts of short-term construction activities on off-site sensitive receptors.

OEHHA recently adopted new guidance for the preparation of health risk assessments issued in March 2015 (OEHHA 2015). It developed a cancer risk factor and noncancer chronic reference exposure level for DPM based on continuous exposure over a 30-year time frame. No short-term acute exposure levels that correlate with typical construction activity time frames have been developed for DPM.

The proposed project would be developed over four phases. It is anticipated that the construction duration of each phase would last an average of 48 to 52 months. In addition, construction would not be continuous, but spread out incrementally over a 18-year period, which would limit the exposure to on- and offsite receptors. The United States Environmental Protection Agency (US EPA) AERMOD, Version 9.3, dispersion modeling program was used to estimate excess lifetime cancer risk and chronic non-cancer hazard index for non-carcinogenic risk at the nearest sensitive receptors. Results of the analysis are shown in Table 5.2-19, *Construction Risk Summary*.

Table 5.2-19 Construction Risk Summary

Receptor	Cancer Risk (per million)	Chronic Hazards
Maximum Exposed Receptor – Resident	26.0	0.10
Maximum Exposed Receptor – Beardslee Elementary School	1.4	0.02
Significance Thresholds	10	1.0
Exceeds Threshold?	**Yes**	No

Source: PlaceWorks 2017 (see AppendixC2).
Note: Cancer risk calculated using 2015 OEHHA HRA guidance.

The results of the HRA are based on the maximum modeled receptor concentration over the construction exposure period, conservatively assuming a 24-hour per day outdoor exposure and averaged over a 70-year lifetime. According to the modeling results, the residential maximum exposed receptor (MER) is the single-family residence at 1342 Galen Street along the western boundary of the planning area near Galen Street and the Duarte Flood Control Channel. The school MER location lies within the southeast portion of the Beardslee Elementary School campus near the intersection of Galen Street and Buena Vista Street.

Results of the health risk assessment shown in Table 5.2-9 indicate that the maximum incremental cancer risk during the construction phase of the project at the residential MER is 26.0 per million, which exceeds the significance threshold of 10 per million. Cancer risk for students at Beardslee Elementary School is 1.4 per million and would not exceed 10 per million. For non-carcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the residential and school MER. Therefore, chronic non-carcinogenic hazards are within acceptable limits. As the cancer risk for the residential MER would exceed the 10 per million threshold, project-related construction activities could result in potentially significant health risk impacts to off-site residences.

Impact 5.2-6: Implementation of the proposed City of Hope Campus Plan would not expose sensitive receptors to substantial pollutant concentrations. [Threshold AQ-4]

Impact Analysis: Operation of new land uses consistent with the Campus Plan would result in new area/stationary and mobile sources of criteria air pollutants and TACs in the plan area.

Operational LSTs

The types of land uses that typically generate substantial amounts of stationary source emissions include industrial land uses. The City of Hope Campus Plan would guide expansion of the City of Hope medical office facilities to meet the medical needs of the region. The City of Hope operates a Central Plant to offset campus-wide energy needs associated with building and cooling. These facilities are constructed at institutional facilities, such as hospitals, universities, and county facilities, because they offer co-benefits that reduce the overall energy needs and the amount of electricity and natural gas the agency needs to purchase from the grid/energy purveyor. The existing Central Plant at the City of Hope Campus includes three boilers and chillers. Additionally, the City of Hope campus maintains emergency generators for back-up power to support critical services. These types of equipment require a permit to operate by the SCAQMD.

The proposed project would result in an increase in electricity and natural gas use on the campus (see Table 5.2-17). To accommodate the increase in electricity and natural gas use, the City of Hope may purchase additional energy from electricity purveyors or expand the Central Plant so that it can offset the increase in energy use. At this time, information on the specific equipment that the City of Hope may consider and SCAQMD would permit at the Central Plant is not known; and is therefore considered speculative for this programmatic analysis. Additionally, installation of additional boilers, chillers, emergency generators, and other stationary equipment (e.g., cogeneration unit) necessary to provide heating and cooling and power needs to the City of Hope would require a permit to operate from SCAQMD as required under SCAQMD Regulation XIII, *New Source Review*. This permitting process would be separate from the general occupancy permits issued either by the City of Duarte or City of Irwindale and would provide a control for emissions

associated with any new or modified future stationary equipment and ensure that applicable emissions standards are met and potential impacts are less than significant.

Although operation of the proposed project would result in the use of standard on-site mechanical equipment (such as heating, ventilation, and air conditioning units) and occasional use of landscaping equipment for project site maintenance, air pollutant emissions generated from these activities would be below the SCAQMD screening-level LSTs thresholds, as shown in Table 5.2-20, *Maximum Daily On-Site Localized Operation Emissions at Full Buildout*. Therefore, localized air quality impacts related to stationary-source emissions would be less than significant.

Table 5.2-20 Maximum Daily On-Site Localized Operational Phase Emissions at Full Buildout

Operational Phase	Net Increase in Criteria Air Pollutants (lbs/day)			
	NOx	CO	PM_{10}	$PM_{2.5}$
Area	<1	<1	<1	<1
Energy	11	10	1	1
Total	**11**	**10**	**1**	**1**
SCAQMD LST	203	1,733	4	2
Exceeds LST?	No	No	No	No
New Potential Stationary Sources				
Central Utilities Plant Boilers[1]	3	25	2	2

Source: CalEEMod 2016.3.1; SCAQMD 2008b.

Notes: In accordance with SCAQMD methodology, only on-site stationary sources and mobile equipment occurring within the proposed project site are included in the analysis. LSTs are based on sensitive receptors within 82 feet (25 meters) of the proposed project site within SRA 9. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Toxic Air Contaminants

The proposed project would result in development of approximately 60,000 square feet of industrial-type land uses within the City of Hope campus. However, it is not anticipated that these industrial-type land uses, which would include a 30,000 square-foot data center, would be large emitters of TACs. In addition, and as stated, land uses that have the potential to be substantial stationary sources that would require a permit from SCAQMD for emissions of TACs include industrial land uses, such as chemical processing facilities, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities. Emissions of TACs would be controlled by SCAQMD through permitting and would be subject to further study and health risk assessment prior to the issuance of any necessary air quality permits under SCAQMD Rule 1401. The permitting process ensures that stationary source emissions would be below the SCAQMD significance thresholds of 10 in a million cancer risk and 1 for acute risk at the maximally exposed individual. There may be a possibility that new medical buildings accommodated under the proposed Campus Plan would include stationary sources of emissions such as from an emergency generator or cogeneration unit. For example, the proposed central plant would be located on the southeastern edge of the campus adjacent to undeveloped land. The structure would be located more than 1,000 feet from existing off-site sensitive receptors. Emissions disperse rapidly

from the source and would not be expected to result in a substantial impact to off-site receptors. Therefore, equipment installed through the SCAQMD permitting process would not be expected to result in toxic air contaminant impacts to off-site receptors.

Further, as the proposed project is a program-level document, it is currently unknown which additional types of stationary sources may be installed, if any. However, as stated, any new stationary sources of emissions introduced under the proposed project would require an SCAQMD permit to operate, which would provide a control for emissions. Therefore, overall, impacts related to TACs are considered less than significant. CO Hot Spot Analysis

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9.0 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduce speeds.

The SoCAB has been designated in attainment under both the national and California AAQS for CO. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix (i.e., bridges and tunnels)—in order to generate a substantial CO impact (BAAQMD 2011). The proposed project would generate up to approximately 519 net peak hour trips and would be significantly less than the volumes cited above (Fehr & Peers 2016). Furthermore, the SoCAB has since been designated attainment under both the national and California AAQS for CO. Thus, the proposed project would not have the potential to substantially increase CO hotspots at intersections in the vicinity of the project site, and impacts would be less than significant.

5.2.4 Cumulative Impacts

In accordance with SCAQMD's methodology, any project that produces a significant project-level regional air quality impact in an area that is in nonattainment contributes to the cumulative impact. Cumulative projects within the local area include new development and general growth within the SoCAB. The greatest source of emissions within the SoCAB is mobile sources. Due to the extent of the area potentially impacted from cumulative project emissions (i.e., the SoCAB), SCAQMD considers a project cumulatively significant when project-related emissions exceed the SCAQMD regional emissions thresholds shown in Table 5.2-5.

Construction

The SoCAB is designated nonattainment for O_3 and $PM_{2.5}$ under the California and National AAQS and nonattainment for PM_{10} and lead (Los Angeles County only) under the National AAQS. Construction of cumulative projects will further degrade the regional and local air quality. However, development of the proposed project would not generate construction-related criteria air pollutant emissions that would exceed the SCAQMD regional construction significance threshold. Therefore, the project's contribution to cumulative air quality impacts would be less than significant.

Operation

For operational air quality emissions, any project that does not exceed or can be mitigated to less than the daily regional threshold values is not considered by SCAQMD to be a substantial source of air pollution and does not add significantly to a cumulative air quality impact. Operation of the project would not result in emissions in excess of the SCAQMD regional emissions thresholds. Furthermore, the proposed project would be consistent with regional plans to reduce air pollution. Therefore, the project's contribution to cumulative air quality impacts during project operation would be less than significant.

5.2.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to air quality and were described in detail in Sections 5.2.1.1 of this DEIR and are listed below.

State

- Clean Car Standards – Pavley (AB 1493)
- California Advanced Clean Cars CARB (Title 13 CCR)
- Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Statewide Retail Provider Emissions Performance Standards (SB 1368).
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

SCAQMD

- SCAQMD Rule 201: Permit to Construct
- SCAQMD Rule 402: Nuisance Odors
- SCAQMD Rule 403: Fugitive Dust
- SCAQMD Rule 1113: Architectural Coatings
- SCAQMD Rule 1186: Street Sweeping
- SCAQMD Rule 1403: Asbestos Emissions from Demolition/Renovation Activities

5.2.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.2-1, 5.2-2, 5.2-3, and 5.2-6.

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.2-4** Construction of the proposed project during Phase 1 would exceed the SCAQMD LST for $PM_{2.5}$ and potentially expose sensitive receptors to substantial pollutant concentrations.

- **Impact 5.2-5** Project-related construction activities would could result in potentially significant cancer risk impacts to nearby off-site residences.

5.2.7 Mitigation Measures

Project Design Features

The following project design features would contribute to reducing criteria air pollutant emissions associated with the proposed project:

Energy Efficiency and Conservation

- Exceeding local and state energy-efficiency building requirements is encouraged.

Healthy Design

- Recreational amenities should be incorporated on campus, including community gardens, gathering spaces, campus walking paths/routes, and areas for physical activity.

- Buildings should provide visibility and access to active/recreational areas.

- Bicycle storage and infrastructure should be secure, easily accessible and identifiable, and near building entrances.

- To facilitate pedestrian movement, a continuous, unobstructed path of travel must be maintained in any pathway.

- Pedestrian pathways can be used to connect less active outdoor spaces with more active uses.

Mitigation Measures

Impact 5.2-4

AQ-1 During construction, the construction contractor shall water open exposed surfaces a minimum of three times per day or apply other soil stabilizers on inactive construction areas consistent with the Best Available Control Measures identified in South Coast Air Quality Management District (SCAQMD) Rule 403 to minimize fugitive dust emissions generated from ground disturbing activities. Prior to issuance to construction permits, the construction contractor shall note the watering and/or soil stabilization requirement on all construction

plans submitted to the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development.

Impact 5.2-5

AQ-2 The project construction contractor(s) shall use construction equipment fitted with Level 3 Diesel Particulate Filters (DPF) for all construction equipment of 50 horsepower or more. Prior to any construction, the construction contractor(s) shall ensure that all construction plans submitted to the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development, clearly show the requirement for Level 3 DPF for construction equipment over 50 horsepower. During construction, the construction contractor(s) shall maintain a list of all operating equipment in use on the project site for verification by the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development. The construction equipment list shall state the makes, models, and number of construction equipment on site. Equipment shall be properly serviced and maintained in accordance with manufacturer recommendations. The construction contractor(s) shall ensure that all non-essential idling of construction equipment is restricted to five minutes or less in compliance with California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449.

5.2.8 Level of Significance After Mitigation

Impact 5.2-4

As shown in Table 5.2-21, *Maximum Daily Onsite Localized Construction Emissions, Mitigated*, incorporation of Mitigation Measure AQ-1 would reduce the maximum daily onsite $PM_{2.5}$ emissions generated during Phase 1 site preparation activities to below the SCAQMD screening-level LST. Therefore, Impact 5.2-4 would be reduced to a less than significant level.

Table 5.2-21 Maximum Daily Onsite Localized Construction Emissions, Mitigated

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 1 and Phase 2				
Phase 1 Site Preparation – 2018	48	22	9.27	6.05
3.50-Acre LSTs[3]	165	1,343	10.49	6.50
Exceeds LSTs?	No	No	No	No

Source: CalEEMod Version 2016.3.1., SCAQMD 2008b, and SCAQMD 2011. Highest winter or summer emissions are reported.

1 Based on the preliminary information provided by the applicant. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults.

2 Includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers. Mitigation Measure AQ-1 requiring water exposed surfaces a minimum of three times a day is also incorporated.

3 LSTs are based on receptors within 82 feet (25 meters).

Impact 5.2-5

As shown in Table 5.2-22, *Construction Risk Summary, Mitigated*, incorporation of Mitigation Measure AQ-2 would require use of Level 3 diesel particulate filters (DPF), which would reduce cancer risk to 5.1 per million for off-site residential receptors. With implementation of Mitigation Measure AQ-2, potential construction-related health risk would be reduced to below the 10 per million significance threshold and, Impact 5.2-5 would be reduced to a less than significant level.

Table 5.2-22 Construction Risk Summary, Mitigated

Receptor	Cancer Risk (per million)[1]	Chronic Hazards[1]
Maximum Exposed Receptor – Resident	5.1	0.02
Significance Thresholds	10	1.0
Exceeds Threshold?	No	No

Source: PlaceWorks 2017 (see Appendix C2).
Note: Cancer risk calculated using 2015 OEHHA HRA guidance.
[1] Risks incorporate Mitigation Measure AQ-2, which includes using construction equipment with Level 3 DPF for equipment over 50 horsepower.

5.2.9 References

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