5.2 AIR QUALITY

This section of the Draft Environmental Impact Report (EIR) examines the air quality in the project area, includes a summary of applicable air quality regulations, and analyzes potential air quality impacts associated with the proposed project. Air quality impacts were assessed in accordance with methodologies recommended by the California Air Resources Board (CARB) and the Shasta County Air Quality Management District (SCAQMD). Where quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod). Air quality technical data is included in Appendix 15.2, AIR QUALITY DATA.

5.2.1 ENVIRONMENTAL SETTING

NORTHERN SACRAMENTO VALLEY AIR BASIN

The proposed project is located at the northern end of the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB consists of a total of seven counties: Sutter, Yuba, Colusa, Butte, Glenn, Tehama, and Shasta. The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada range. These mountain ranges reach heights in excess of 6,000 feet above mean sea level, with individual peaks rising much higher. The mountains form a substantial physical barrier to locally created pollution as well as that transported northward on prevailing winds from the Sacramento metropolitan area.[1]

The environmental conditions of Shasta County are conducive to potentially adverse air quality conditions. The basin area traps pollutants between two mountain ranges to the east and the west. This problem is exacerbated by a temperature inversion layer that traps air at lower levels below an overlying layer of warmer air. Prevailing winds in the area are from the south and southwest. Sea breezes flow over the San Francisco Bay Area and into the Sacramento Valley, transporting pollutants from the large urban areas. Growth and urbanization in Shasta County have also contributed to an increase in emissions.

AIR POLLUTANTS OF CONCERN

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state laws. These regulated air pollutants are known as "criteria air pollutants" and are categorized into primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxide (NO_X), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), lead, and fugitive dust are primary air pollutants. Of these, CO, SO_2, PM_{10}, and $PM_{2.5}$ are criteria pollutants. ROG and NO_X are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants.

Sources and health effects commonly associated with criteria pollutants are summarized in Table 5.2-1, CRITERIA AIR POLLUTANTS SUMMARY OF COMMON SOURCES AND EFFECTS.

[1] Sacramento Valley Air Quality Engineering Professionals. *Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan.* 2015.

Table 5.2-1
CRITERIA AIR POLLUTANTS SUMMARY OF COMMON SOURCES AND EFFECTS

Pollutant	Major Man-Made Sources	Human Health & Welfare Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to global warming and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.
Ozone (O_3)	A colorless or bluish gas known as smog formed by a chemical reaction between volatile organic compounds (VOC) and NOx in the presence of sunlight. VOCs are also commonly referred to as reactive organic gases (ROGs). Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles, and dyes.
Particulate Matter (PM_{10} & $PM_{2.5}$)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned; when gasoline is extracted from oil; or when metal is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and large ships, and fuel combustion in diesel engines.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.

Source: California Air Pollution Control Officers Association. *Health Effects*. 2013. [Online]: http://www.capcoa.org/health-effects/. Accessed: October 19, 2018.

TRANSPORT OF OZONE

Ozone is found at ground level and in the upper regions of the atmosphere. Both types of ozone have the same chemical composition (O_3). While upper atmospheric ozone protects the earth from the sun's harmful rays, ground level ozone is the main component of smog. Tropospheric, or ground level ozone, is not emitted directly into the air but is created by chemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROG) in the presence of sunlight. Generally, low wind speeds or stagnant air coupled with warm temperatures and cloudless skies provide for the optimum conditions for ozone formation. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often impacts a widespread area.

Ozone can also be transported long distances by wind. For this reason, even rural areas can experience high ozone levels.[2] In the Northern Sacramento Valley Planning Area (NSVPA), ozone is a seasonal problem typically occurring during the months of May through October. Sources of NO_X and ROG emissions include motor vehicles, power plants, factories, chemical solvents, combustion products from various fuels, and consumer products.

The NSVPA districts experience transport ozone from the Broader Sacramento Area, which comprise of all of the Sacramento Metropolitan AQMD, Yolo-Solano AQMD, and a portion of El Dorado, Placer, and Sutter Counties. Emissions that were originally created in the Broader Sacramento Area can be transported northward via prevailing winds to affect the pollution levels of the NSVPA.[3] The California Air Resources Board (CARB) has also identified that air pollution is transported from the Broader Sacramento Area to the Upper Sacramento Valley.[4] On most summer days, the so-called "delta breeze" blows from the Carquinez Strait northeast towards Sacramento. Reaching Sacramento, the delta breeze turns northward and continues into the northern Sacramento Valley and the foothills of the northern Sierra Nevada. It is possible under the right conditions that Bay Area emissions could also be carried to the Northern Sacramento Valley and to the foothills of the northern Sierra Nevada. The impacts of transported Broader Sacramento Area air pollution to Districts in the Upper Sacramento Valley are variable.

Transport from the Broader Sacramento Area dominates the air quality in the Upper Sacramento Valley, as far north as Butte and Tehama County. However, violations in Shasta County, at the northern end of the Sacramento Valley, are occasionally entirely due to local emissions, sometimes entirely due to transport, and sometimes a mixture of both. According to CARB, motor vehicles are by far the largest source of ozone precursor emissions in the NSVPA. Despite an increase in number of vehicle miles traveled, motor vehicle emissions are offset by increasingly stringent motor vehicle emission controls and cleaner burning gasoline.[5]

AMBIENT AIR QUALITY

Criteria Air Pollutant Monitoring Data

Ambient air quality in Redding, and thus at the project site, can be inferred from ambient air quality measurements conducted at air quality monitoring stations. Existing levels of ambient air quality and historical trends and projections in the region are documented by measurements made by the SCAQMD, which is the air pollution regulatory agency for the portion of the NSVAB in Shasta County. These measurements are affected by pollutants generated by the urbanized land uses in Shasta County as well as by land uses in the entire NSVAB and beyond.

Ozone, PM_{10}, and $PM_{2.5}$ are the primary pollutants affecting the NSVAB. The nearest air quality monitoring site to the project site that monitors ambient concentrations of ozone and airborne particulates is located on the roof of the Redding Health Department in Redding, approximately 4.5 miles southwest of the project site. Table 5.2-2, AMBIENT AIR QUALITY MONITORING DATA, summarizes the published data since 2013 for each year that the monitoring data is provided.

[2] U.S. Environmental Protection Agency. *Ground-Level Ozone Basics*. 2018. [Online]: https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics. Accessed: February 12, 2019.
[3] Sacramento Valley Air Quality Engineering Professionals. *Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan.* 2015.
[4] California Air Resources Board. *Ozone Transport: 2001 Review*. April 2001.
[5] Ibid.

Table 5.2-2
AMBIENT AIR QUALITY MONITORING DATA

Pollutant Standards	2015[1]	2016[1]	2017[1]
Ozone (O_3)			
1-hour Maximum Concentration (ppm)	0.078	0.084	0.082
8-hour Maximum Concentration (ppm)	0.069	0.074	0.075
Number of Days Standard Exceeded			
CAAQS 1-hour (>0.09 ppm)	0	0	0
NAAQS 8-hour (>0.070 ppm)	0	5	3
Particulate Matter Less Than 10 Microns (PM_{10})			
National 24-hour Maximum Concentration	80.3	28.4	88.9
State 24-hour Maximum Concentration	78.3	27.6	84.8
State Annual Average Concentration (CAAQS=20 µg/m3)	6.5	0	13.8
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 µg/m3)	0	0	0
CAAQS 24-hour (>50 µg/m3)	1	0	2
Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$)			
National 24-hour Maximum Concentration	64.6	12.6	67.3
State 24-hour Maximum Concentration	64.6	12.6	67.3
Number of Days Standard Exceeded			
NAAQS 24-hour (>35 µg/m3)	1	0	1

NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; ppm = parts per million; µg/m3 = micrograms per cubic meter; NM = not measured

Note:
1. Measurements taken at the Redding Health Department Monitoring Station located at 2630 Hospital Lane, Redding, California 96001.

Source: California Air Resources Board. *Aerometric Data Analysis and Management System (ADAM) Air Quality Data Statistic.* 2016. [Online]: http://www.arb.ca.gov/adam/index.html. Accessed: October 24, 2018.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is known to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome-plating operations; commercial operations, such as gasoline stations and dry cleaners; and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally (as TACs rapidly disperse from the source). TACs

can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

Most recently, CARB identified diesel particulate matter (DPM) as a toxic air contaminant. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine.[6] Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 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 lung.

Residential areas are considered to be sensitive receptors 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. Children are considered more susceptible to health effects of air pollution due to their immature immune systems and developing organs.[7] As such, schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. The project site is located in an area of single and multi-family homes. The nearest residential land uses would be those adjacent to the project site at the western boundary. In addition, two developed residential parcels (in unincorporated County area) are located immediately to the east of the project site. No children schools, hospitals, or senior care homes exist in the immediate area.

5.2.2 REGULATORY SETTING

The following is a description of federal, State, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

FEDERAL AND STATE

Ambient Air Quality Standards

The proposed project has the ability to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, development activities under the proposed project fall under the ambient air quality standards promulgated at the local, State, and federal levels. The federal Clean Air Act of 1971 and the Clean Air Act Amendments (1977) established the national ambient air quality standards (NAAQS), which are promulgated by the U.S. Environmental Protection Agency (EPA).

[6] U.S. Environmental Protection Agency. *Health Assessment Document for Diesel Engine Exhaust.* 2002. [Online]: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060. Accessed: October 25, 2018.
[7] Office of Environmental Health Hazard Assessment. *Air Toxicology and Epidemiology: Air Pollution and Children's Health.* 2007. [Online]: http://oehha.ca.gov/public_info/facts/airkids.html. Accessed: October 25, 2018.

The State of California has also adopted its own California ambient air quality standards (CAAQS), which are promulgated by CARB. Implementation of the project would occur in the Shasta County portion of the NSVAB, which is under the air quality regulatory jurisdiction of the SCAQMD and is subject to the rules and regulations adopted by the air district to achieve the NAAQS and CAAQS. Applicable federal, state, regional, and local laws, regulations, plans, and guidelines relevant to the California Environmental Quality Act (CEQA) review process are summarized below. As shown in Table 5.2-3, AIR QUALITY STANDARDS, these pollutants include O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

Table 5.2-3
AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	—
	8 Hour	0.070 ppm (137µg/m^3)	0.070 ppm (137µg/m^3)
Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	N/A
Particulate Matter – Fine ($PM_{2.5}$)	24 Hour	N/A	35 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (665 µg/m^3)	75 ppb (196 µg/m^3)
	3 Hour	—	N/A
	24 Hour	0.04 ppm (105 µg/m^3)	N/A
Lead	Calendar Quarter	N/A	1.5 µg/m^3
	30 Day Average	1.5 µg/m^3)	N/A
Visibility-Reducing Particles	8 Hour (10:00 to 18:00 PST)	—	N/A
Sulfates	24 Hour	25 µg/m^3	N/A
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	N/A
Vinyl Chloride (chloroethene)	24 Hour	0.01 ppm (26 µg/m^3)	N/A

Note:
1. mg/m^3=milligrams per cubic meter; ppm=parts per million; ppb=parts per billion; µg/m^3=micrograms per cubic meter.

Source: California Air Resources Board. *Ambient Air Quality Standards.* 2016. [Online]: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed: October 25, 2018.

In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Air Quality Attainment Plans

In 1994, the air districts in the Northern Sacramento Valley Planning Area (NSVPA), which includes the SCAQMD jurisdiction, prepared an Air Quality Attainment Plan for ozone. This plan was updated in

1997, 2000, 2003, 2006, 2009, 2012, and again in 2015. Like the preceding plans, the 2015 plan focuses on the adoption and implementation of control measures for stationary sources, area-wide sources, indirect sources, and public information and education programs. The 2015 plan also addresses the effect that pollutant transport has on the NSVPA's ability to meet and attain the state standards. Shasta County still remains in nonattainment for Ozone CAAQS.

The Air Quality Attainment Plan provides local guidance for air basins to achieve attainment of ambient air quality standards. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Areas for which there is insufficient data available are designated unclassified. The attainment status for the Shasta County portion of the NSVAB is included in Table 5.2-4, FEDERAL AND STATE AMBIENT AIR QUALITY ATTAINMENT STATUS FOR SHASTA COUNTY. The region is nonattainment for state ozone and PM_{10} standards.

Table 5.2-4
FEDERAL AND STATE AMBIENT AIR QUALITY ATTAINMENT STATUS FOR SHASTA COUNTY

Pollutant	Federal	State
8-Hour Ozone (O_3)	Unclassified/Attainment	Nonattainment
Coarse Particulate Matter (PM_{10})	Unclassified	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Unclassified/Attainment	Attainment
Carbon Monoxide (CO)	Unclassified/Attainment	Unclassified
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified	Attainment

Source: California Air Resources Board. *State and Federal Area Designation Maps*. 2017. [Online]: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed: October 25, 2018.

Toxic Air Contaminant Regulations

In 1983, the California legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The 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." A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal Clean Air Act (42 United States Code Section 7412[b]) is a TAC. Under state law, the California Environmental Protection Agency, acting through CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as toxic air contaminants. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance (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 eleven TACs, all of which are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987. 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 in the form of notices and public meetings.

Since the last update to the TAC list in December 1999, CARB has designated 244 compounds as toxic air contaminants.[8] 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 attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

California Diesel Risk Reduction Plan

In September 2000, CARB adopted the Diesel Risk Reduction Plan (DRRP), which recommends many control measures to reduce the risks associated with DPM and achieve a goal of an 85 percent reduction of DPM generated by 2020. The DRRP incorporates measures to reduce emissions from diesel-fueled vehicles and stationary diesel-fueled engines. Ongoing efforts by CARB to reduce diesel-exhaust emissions from these sources include the development of specific statewide regulations, which are designed to further reduce DPM emissions. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce DPM emissions.

Since the initial adoption of the DRRP in September 2000, CARB has adopted numerous rules related to the reduction of DPM from mobile sources, as well as the use of cleaner-burning fuels. Transportation sources addressed by these rules include public transit buses, school buses, on-road heavy-duty trucks, and off-road heavy-duty equipment.

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

CARB's On-Road Heavy-Duty Diesel Vehicles (In Use) Regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Heavier trucks were required to be retrofitted with particulate matter filters beginning January 1, 2012, and older trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel-fueled trucks and buses, as well as to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds.

REGIONAL

Shasta County Air Pollution Control District

The SCAQMD is designated by law to adopt and enforce regulations to achieve and maintain ambient air quality standards. The SCAQMD, along with other air districts in the NSVAB, has committed to jointly

[8] California Air Resources Board, *Final Staff Report: Update to the Toxic Air Contaminant List*, 1999.

prepare the NSVAB Air Quality Attainment Plan for the purpose of achieving and maintaining healthful air quality throughout the air basin. In addition, the SCAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs, and it regulates agricultural burning. Other responsibilities include monitoring air quality, preparing clean air plans, and responding to citizen complaints concerning air quality.

All projects in Shasta County are subject to applicable SCAQMD rules and regulations in effect at the time of construction. Descriptions of specific rules applicable to future construction resulting from implementation of the proposed project may include, but are not limited to:

- SCAQMD Rule 2-1A, Authorities to Construct/Permits to Operate, allows any person to use construction equipment for construction activities, and must obtain a permit to operate prior to installation activities.

- SCAQMD Rule 2-2, Emissions Reduction Credit and Banking Rule, provides for a mechanism for permitted and non-permitted emissions sources to deposit, transfer, and use emission reduction credits (ERCs) as offsets as allowed by applicable laws and regulations. The provisions of Rule 2:2 apply to the deposit, transfer, and use of ERCs from stationary sources and open biomass burning sources of air pollution emissions. ERCs are typically required when stationary source pollutants exceed 25 tons per year.

- SCAQMD Rule 3-2, Specific Air Contaminants, controls the amount of air contaminants allowed to be discharged into the atmosphere.

- SCAQMD Rule 3-31, Architectural Coatings, controls the architectural coatings and solvents used at the project site

- SCAQMD Rule 3-15, Cutback and Emulsified Asphalt, cutback and emulsified asphalt application shall be conducted in accordance with Rule 3-15.

- SCAQMD Rule 3-16, Fugitive, Indirect, or Non-Traditional Sources, controls the emission of fugitive dust during earth-moving, construction, demolition, bulk storage, and conditions resulting in wind erosion.

- SCAQMD Rule 3-28, Stationary Internal Combustion Engines, limits the emissions of NO_X and CO from stationary internal combustion engines.

- SCAQMD Rule 3-32, Adhesives and Sealants, limits the emissions of volatile organic compounds (VOCs) from adhesives and sealants and associated primers, and from related surface preparation solvents, cleanup solvents, and strippers.

- SCAQMD Rule 3-33, Wood Products Coating Operations, limits the emissions of volatile organic compounds (VOCs) from coatings and strippers used on wood products and from products used in surface preparation and cleanup.

LOCAL

City of Redding General Plan

Applicable goals and policies relative to the proposed project are listed in Table 5.2-5, CONSISTENCY WITH APPLICABLE CITY OF REDDING GENERAL PLAN GOALS AND POLICIES FOR AIR QUALITY, followed by a brief explanation of how the proposed project complies with the objectives and policies.

Table 5.2-5
CONSISTENCY WITH APPLICABLE CITY OF REDDING GENERAL PLAN GOALS AND POLICIES FOR AIR QUALITY

General Plan Goal / Policy	Consistency Analysis
GENERAL PLAN GOAL 1 *EFFECTIVE COMMUNICATION, COOPERATION, AND COORDINATION IN DEVELOPING AND IMPLEMENTING COMMUNITY AND REGIONAL AIR QUALITY PROGRAMS.*	
Policy 1. The City will require an air quality impact analysis using the recommended methods promulgated by the Air Quality Management District (AQMD) for all projects that are subject to CEQA review and which exceed emissions thresholds established by the AQMD.	**Consistent.** The impact discussions below have been prepared using the methodology promulgated by the SCAQMD.
Policy 2. Report on Cumulative Air Quality Impacts.	**Consistent.** This policy is assessed below in Subsection 5.2.5, *Cumulative Setting*.
Policy 8. Regional and Local Plan Consistency.	**Consistent.** Impact 5.2-1 below evaluates the proposed project's consistency with regional and local plans.
GENERAL PLAN GOAL 2 *REDUCE MOTOR VEHICLE TRIPS AND VEHICLE MILES TRAVELED AND INCREASE AVERAGE VEHICLE RIDERSHIP (AVR).*	
Policy 28. Bikeway and Pedestrian Plan. The City shall ensure that the Regional Bikeway Plan and the City's Comprehensive Bikeway Plan include a comprehensive system of bikeways and pedestrian paths, which is planned and constructed in accordance with the adopted plan, based on analysis of existing and future use by the area to be served.	**Consistent.** The proposed project would be designed and constructed consistent with the provisions of RMC Title 11, *Traffic and Vehicles,* and RMC Title 13, *Street and Sidewalks*, and provide appropriate bicycle signage per direction by the City. The proposed project has been designed to provide a 6-foot wide sidewalk and landscape buffer along the east side of Henderson Road (South), a 6-foot sidewalk along the northwest side of Henderson Road (North), and an 8-foot wide sidewalk along the project's southern frontage along the Parkview Avenue (Open Space Access) connection from Henderson Road (South) to the Henderson Open Space. A pedestrian walkway commencing approximately 200 feet west of the intersection of Henderson Road (North) and Hartnell Avenue, will provide pedestrian access to the northerly portion of the Henderson Open Space and Sacramento River. This walkway will also provide pedestrian access from the existing Cypress Avenue stairway to the project site and the Henderson Open Space. Refer to Figures 3-6b and 3-6c, ENLARGED SITE PLANS. Bicycle routes throughout the project site and on adjoining streets have been defined to facilitate access to the Redding Area Bus Authority (RABA) transit stop located approximately 200 feet from the project site at the intersection of Henderson Road (North) and Hartnell Avenue. The proposed project also includes 28 secured bicycle racks onsite (refer to Figure 3-6a, PROPOSED SITE PLAN).
GENERAL PLAN GOAL 3 *REDUCE PARTICULATE EMISSIONS FROM SOURCES UNDER THE JURISDICTION OF THE CITY.*	
Policy 29. The City will require measures to reduce particulate emissions from construction, grading, and demolition to the maximum extent feasible.	**Consistent.** The project contains such measures as shown in **MM 5.2-1.**
Source: City of Redding. *2000-2020 General Plan*. October 2000.	

5.2.3 STANDARDS OF SIGNIFICANCE

SIGNIFICANCE CRITERIA

In accordance with State *CEQA Guidelines*, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to air quality have been derived from Appendix G of the State *CEQA Guidelines*

- *Conflict with or obstruct implementation of any applicable air quality plan.* Refer to Impact 5.2-1, below.
- *Violate any air quality standard or contribute substantially to an existing or projected air quality violation.* Refer to Impact 5.2-2 and Impact 5.2-3, below.
- *Expose sensitive receptors to substantial pollutant concentrations.* Refer to Impact 5.2-4, Impact 5.2-5, and Impact 5.2-6 below.
- *Create objectionable odors affecting a substantial number of people.* Refer to Impact 5.2-7, below.
- *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).* Refer to Impact 5.2-8, below.

SCAQMD and the City's *General Plan* Air Quality Element thresholds, which are identical, have been used to determine air quality impacts in this analysis. To assist in the evaluation of air quality impacts, the SCAQMD and the City of Redding have adopted air quality thresholds for determination of impact significance for projects subject to CEQA review. These thresholds are consistent with New Source Review Rule 2-1 adopted by the SCAQMD Board in 1993 as required by the California Clean Air Act. The thresholds of significance are summarized in Table 5.2-6, SHASTA COUNTY AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS OF SIGNIFICANCE.

Table 5.2-6
SHASTA COUNTY AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS OF SIGNIFICANCE

Threshold	Emissions (pounds per day)		
	NO_X	ROG	PM_{10}
Level A Thresholds	25	25	80
Level B Thresholds	137	137	137
Source: City of Redding. *2000-2020 General Plan.* October 2000.			

The SCAQMD and the *General Plan* recommend that projects apply Standard Mitigation Measures (SMM) and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds Level A thresholds and that projects apply SMM, BAMM, and special BAMM when a project exceeds Level B thresholds. If, after applying BAMM, the project still exceeds Level B threshold, then a minimum of 25

percent of the unmitigated emissions exceeding 137 pounds per day must be offset by reducing emission from existing sources of pollution. Projects that cannot mitigate emissions to levels below the Level B thresholds are considered significant, thereby requiring the preparation of an EIR.

Based on these standards, the effects of the proposed project have been categorized as either a less than significant impact or a potentially significant impact. Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant and unavoidable impact.

5.2.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

METHODOLOGY

Air quality impacts were assessed in accordance with methodologies recommended by CARB and the SCAQMD, and the City of Redding. Where quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. CalEEMod contains default values for much of the information needed to calculate emissions. However, project specific, user supplied information can also be used when it is available. Vehicle trip generation rates and trip distances for proposed land use were adjusted to reflect project-specific data obtained from the traffic analysis prepared for the proposed project. The CalEEMod model was run to calculate daily emissions during the summer and winter months.

As discussed above, the significance of construction and operational emissions are assessed based on whether the SCAQMD's Level A and Level B thresholds are exceeded. The SCAQMD has set its Level B CEQA significance thresholds for NO_X and ROG (VOC) at 25 tons per year (expressed as 137 pounds per day) based on the FCAA, which defines a major stationary source as having the potential to emit 25 tons per year or more of a combination of pollutants. The thresholds correlate with the trigger levels for the federal New Source Review (NSR) Program and SCAQMD Rule 2-1 (New Source Review) for new or modified sources. The NSR Program was created by the FCAA to ensure that stationary sources of air pollution are constructed or modified in a manner that is consistent with attainment of health-based federal ambient air quality standards. The federal ambient air quality standards establish the levels of air quality necessary, with an adequate margin of safety, to protect public health. Therefore, projects that do not exceed the SCAQMD's mass emissions thresholds would not violate any air quality standards or contribute substantially to an existing or projected air quality violation and no criteria pollutant health impacts.

NO_X and ROG are precursor emissions that form ozone in the atmosphere in the presence of sunlight where the pollutants undergo complex chemical reactions. It takes time and the influence of meteorological conditions for these reactions to occur, so ozone may be formed at a distance downwind from the sources. Breathing ground-level ozone can result health effects that include: reduced lung function, inflammation of airways, throat irritation, pain, burning, or discomfort in the chest when taking a deep breath, chest tightness, wheezing, or shortness of breath. In addition to these effects, evidence from observational studies strongly indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admissions, increased daily mortality, and other markers of morbidity. The consistency and coherence of the evidence for effects upon asthmatics

suggests that ozone can make asthma symptoms worse and can increase sensitivity to asthma triggers. California established the health advisory level after medical research showed that ozone posed a health threat at 0.09 ppm, especially for children, the elderly, persons with heart or lung disease, and during strenuous exercise.

Ozone is not formed at the location of emission and the quantity of precursor emissions is not proportional to local ozone concentrations. The emission of NO_X and ROG do not directly cause health effects; it is the resulting concentration of criteria pollutants, which is influenced by sunlight, chemical reactions, and transport (i.e., regional impacts), that are not feasible to model at the project level.[9] In addition, current SCAQMD and CARB rules and regulations would reduce include criteria pollutant control measures. Due to the uncertainty in the relationship between project-level mass emissions and regional ozone formation as well as limitations with currently available technical tools, it is impossible to determine the health risk effects of ozone precursor emissions. In addition, it is important to note that the proposed project, representing a 129,600 square-foot wellness campus, is considered relatively small (i.e., not a Specific Plan or other large land development project) and such an analysis is not feasible in light of the project's small scale.

A formal health risk assessment is necessary for projects anticipated to emit state or federal identified toxic air contaminants (TACS)/hazardous air pollutants (HAPs). For typical land use projects that do not propose stationary source of emissions (e.g., smoke stacks), diesel fueled particulates (DPM) are the primary TAC of concern. Land uses that generate substantial amounts of DPM include warehouses, distribution centers, etc. The proposed project does not propose any major sources of stationary emissions or warehouses, distribution centers, or other uses requiring substantial amounts of diesel traffic. However, the project includes three emergency backup generators that would result in DPM emissions. Emergency backup generators are regulated by SCAQMD and typically have testing and maintenance limited to 100 hours per year, per SCAQMD Rule 3-28. It is assumed that each generator would be a 500 horsepower diesel generator and operate a maximum of 30 minutes per day when tested, and up to 50 hours for testing annually. Emergency backup generator emissions were modeled with CalEEMod. An emissions rate (in grams per second) was calculated from the mass emissions generated by CalEEMod. The emissions rate was used in the U.S. EPA AERMOD dispersion model to determine emissions concentrations and associated risk levels. Additionally, a health risk assessment was also performed with AERMOD to determine impacts from construction TAC emissions.

Air quality impacts are analyzed below according to topic. Mitigation measures directly correspond with an identified impact.

IMPACT 5.2-1	***Implementation of the proposed project would conflict with or obstruct implementation of the 2015 Air Quality Attainment Plan.***

Significance: Potentially Significant Impact.

[9] As noted in the San Joaquin Valley Air Pollution Control District (SJVAPCD) Amicus Curiae Brief for *Sierra Club v. County of Fresno, t*he computer models used to simulate and predict and attainment date for ozone or particulate matter NAAQS are based on regional inputs, such as regional inventories of precursor pollutants (NO_X, SO_X, and VOCs) and atmospheric chemistry and meteorology. The models simulate future ozone or PM levels based on predicted changes in precursor emissions region wide. The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the NAAQS attainment date. Rather, the air district modeling and planning strategy is regional in nature and based on the extent to which all of emission-generating sources (current and future) must be controlled in order to reach attainment.

Impact Analysis: Under state law, the California Clean Air Act requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date. As previously stated, the Shasta County portion of the NSVAB is classified nonattainment for state ozone and PM_{10} standards (refer to Table 5.2-4).

The NSVPA *2015 Air Quality Attainment Plan* is the most recent air quality planning document covering Shasta County. Air quality attainment plans are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards. State law makes CARB the lead agency for all purposes related to the Air Quality Attainment Plan. Local air districts prepare air quality attainment plans and submit them to CARB for review and approval. The NSVPA *2015 Air Quality Attainment Plan* includes forecast ROG and NO_X emissions (ozone precursors) for the entire region through the year 2020. These emissions are not appropriated by county or municipality.

The consistency of the proposed project with the NSVPA *2015 Air Quality Attainment Plan* is determined by its consistency with air pollutant emission projections in the plan. Implementation of the project could increase vehicle miles traveled, and thus ROG and NO_X emissions, which could conflict with air quality planning efforts associated with the NSVPA *2015 Air Quality Attainment Plan*. As previously stated, the plan cites projected O_3 precursor emissions (ROG and NO_X) through the year 2020. For the purposes of this analysis, the emissions resulting from proposed project operations were quantified and compared with the NSVPA *2015 Air Quality Attainment Plan* 2020 ozone precursor emissions projections.

The NSVPA *2015 Air Quality Attainment Plan* includes control strategies necessary to attain the California ozone standard at the earliest practicable date, as well as developed emissions inventories and associated emissions projections for the region showing a downtrend for both ROG and NO_X. The proposed project would result in long-term emissions from area and mobile emission sources. As discussed in Impact 5.2-3, below, the ozone precursor emissions, ROG and NO_X, would increase as a result of the project. The upward trend in ozone precursor emissions is not reflective of the projected ozone emissions reductions documented in the NSVPA *2015 Air Quality Attainment Plan*, which projects a 16 percent reduction in ROG emissions and a 32 percent reduction in NO_X emissions from area and mobile sources in the NSVPA by the year 2020 (the latest year projected in the NSVPA *2015 Air Quality Attainment Plan*).

Table 5.2-10, LONG-TERM MITIGATED OPERATIONAL EMISSIONS, shows the ozone precursors and particulate matter that would be released as part of the proposed project. Section 3.0, Project DESCRIPTION, describes the existing *General Plan* land use designation for the proposed project site as "General Office" (GO), "General Commercial" (GC), and "Greenway" (GWY) to "Public Facilities" (PF-I). The general plan amendment would result in an increase of emissions that were not evaluated in the *2015 Air Quality Attainment Plan*. This may result in a conflict with implementation of the *2015 Air Quality Attainment Plan* by resulting in an increase of ozone precursor emissions.

However, no single project is sufficient in size, but itself, to result in nonattainment of ambient air quality standards. A project emitting less than 25 tons per year of NO_X or VOC (i.e., below SCAQMD Level B thresholds) is small enough that its regional impact on ambient ozone levels may not be detected in the regional air quality models that are currently used to determine ozone levels. It takes a large amount

of additional precursor emissions to cause a modeled increase in ambient ozone levels over an entire region.

This is in part because ozone formation is not linearly related to emissions. Ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology and seasonal impacts, and because ozone is formed some time later and downwind from the actual emission. Thus, it would also not be feasible to directly correlate project emissions of VOC or NO_X with specific health impacts from ozone.[10]

As required by Sections 40918, 40919, 40920, and 40920.5 of the California Health & Safety (H&S) Code, areas designated as being in nonattainment for one or more of the criteria pollutants identified in State or Federal standards must achieve "no net increase" in emissions (i.e., offsets) of those pollutants and their precursors. Although Shasta County has been designated a nonattainment area with respect to the State ozone and PM_{10} ambient air quality standards, it has further been classified as having "moderate air pollution."

Shasta County maintains a bank of Emissions Reduction Credits (ERCs) to be used as mitigation offsets for emissions increases. As described above in Subsection 5.2.3, *Regulatory Setting*, the SCAQMD maintains a bank of emissions reduction credits (ERCs), which can be used by land owners and project applicants to offset emissions generated by a new or proposed project or operation. The ERCs can be used to offset the increase in emissions generated by a project. ERCs are typically required when stationary source pollutants exceed 25 tons per year.[11]

As discussed in Impact 5.2-3, the majority of project emissions would be generated by mobile sources, which cannot be regulated by the City. While there are no feasible mitigations that would reduce vehicle trips, as discussed in Impact 5.2-3, the project would implement a variety of voluntary trip reduction programs and ridesharing programs for employees. Additionally, the project buildings would be more energy efficient with Energy Star efficient appliances and through the utilization of 100 percent renewable energy through a community choice aggregate (CCA), purchasing 100 percent renewable energy from the local energy utility, the onsite generation of renewable energy, or a combination thereof (refer to **MM 5.6-1** in Section 5.6, GREENHOUSE GASES AND CLIMATE CHANGE). Project emissions would also not exceed the SCAQMD's Level B thresholds (refer to Table 5.2-9). Projects with emissions below Level B thresholds that implement SMMs and BAMMs are considered less than significant. **MM 5.6-1** represents the feasible SMMs and appropriate BAMMs for the project (required when a project exceeds Level A thresholds). **MM 5.6-1** requires implementation of voluntary trip reduction program, voluntary ride-sharing program for all employees, commute trip reduction subsidies to reduce vehicle trips and trip lengths, which would reduce mobile source emissions. Nevertheless, there are no additional feasible mitigations that would reduce ozone precursor emissions consistent with the *2015 Air Quality Attainment Plan*, and this impact is considered *significant and unavoidable*.

Mitigation Measures: Implement **MM 5.6-1** in Section 5.6, GREENHOUSE GASES AND CLIMATE CHANGE.

[10] On December 24, 2018, the California Supreme Court issued an opinion identifying the need to provide sufficient information connecting a project's air emissions to health impacts or explain why such information could not be ascertained (*Sierra Club v. County of Fresno* [Friant Ranch, L.P.] [2018] Cal.5th, Case No. S219783).

[11] Shasta County Air Quality Management District. *Protocol for Review, Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act*. November 2003.

Level of Significance After Mitigation: Impacts would be *significant and unavoidable*.

IMPACT 5.2-2	***Project implementation could potentially violate an air quality standard or contribute substantially to an existing or projected air quality violation during project construction.***

Significance: Potentially Significant Impact.

Impact Analysis: Subsequent land use activities associated with implementation of the proposed project would introduce additional construction emissions, which would adversely affect regional air quality. Short-term air quality impacts are predicted to occur during grading and construction operations associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from grading and building construction; and
- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

Phase 1 of the project includes demolition and removal of an existing 7,500 square-foot building and approximately 64,000 square feet of pavement. Phase 1 also includes mass grading of the entire 10.55-acre project site, and construction of Building 'A', interior roads and 338 parking spaces. Phase 1 construction would commence in 2020 and be complete by 2022. It is anticipated that Phase 1 construction would occur for 2 years. Phase 2 construction is assumed to commence in 2022, after completion of Phase 1. Phase 2 would include construction of Buildings 'B' and 'C' and the remaining 211 parking spaces. It is anticipated that Phase 2 construction would occur for 2 years.

Other construction phases would include site preparation, grading, paving and architectural coating. Activities within these phases include grubbing/clearing of the project site, cut/fill, and compaction of soils, installation of utilities (e.g. underground power, sewer, water, telephone, and storm drainage facilities), construction of proposed buildings, paving, painting, and landscaping. Equipment used for construction would vary day-to-day depending on the activity, but would include excavators, scrapers/earthmovers, wheeled dozers, water trucks, forklifts, wheeled loaders, and/or motor graders. Construction air emissions associated with the development of each phase was quantified using the CalEEMod land use emissions model (refer to Appendix 15.2, AIR QUALITY DATA, for model data outputs). These quantified emission projections were then compared with SCAQMD significance thresholds for each phase.

Construction-generated emissions associated with the proposed project could potentially exceed thresholds of significance. Predicted maximum daily construction-generated emissions for the proposed project are summarized in Table 5.2-7, CONSTRUCTION-RELATED EMISSIONS.

Table 5.2-7
CONSTRUCTION-RELATED EMISSIONS

Construction Activities	Maximum Emissions (pounds per day)[1]				
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)
2020 (Phase 1)					
Unmitigated Emissions	4.55	50.26	20.41	11.99	32.72
Mitigated Emissions	1.39	21.92	7.93	4.34	32.72
2021 (Phase 1)					
Unmitigated Emissions	39.25	21.51	1.89	1.16	20.50
Mitigated Emissions	39.25	14.84	0.99	0.36	20.50
20212 (Phase 2)					
Unmitigated Emissions	27.10	27.67	2.04	1.42	31.22
Mitigated Emissions	27.10	21.09	0.84	0.33	31.22
2023 (Phase 2)					
Unmitigated Emissions	27.08	1.33	0.15	0.09	2.10
Mitigated Emissions	27.08	1.33	0.15	0.09	2.10
Threshold A	**25**	**25**	**80**	**None**	**None**
Threshold B	**137**	**137**	**137**	**None**	**None**
Exceed Level A Threshold?	Yes	Yes	No	N/A	N/A
Exceed Level B Threshold?	No	No	No	N/A	N/A

Note:
1. Emissions calculated using CalEEMod version 2016.3.2. Winter emissions.

Refer to Appendix 15.2, AIR QUALITY DATA, for daily emission model outputs.

Based on the modeling conducted, short-term daily emissions associated with the construction of the proposed project would exceed the Level A significance threshold for ROG and NO_X emissions. No criteria emissions would surpass the Level B significance thresholds. SCAQMD recommends that projects apply SMM and appropriate BAMM when a project exceeds Level A thresholds. As such, the implementation of **MM 5.2-1** would be required. Mitigation Measure **MM 5.2-1** requires diesel-fueled construction equipment to have CARB certified Tier 4 interim or better engines to reduce NO_X emissions, and required the use of low-VOC paint to reduce ROG emissions. Additionally, **MM 5.2-1** includes various dust control measures to reduce fugitive PM_{10} and $PM_{2.5}$, such as regular watering of disturbed areas, providing trackout devices, covering stockpiles, and limiting onsite vehicle speeds. Implementation of **MM 5.2-1** would substantially reduce impacts resulting from construction-generated emissions associated with project construction as shown in Table 5.2-7.

Implementation of **MM 5.2-1** would reduce ROG and NO_X emissions, but not to levels below the Level A significance thresholds. However, as emissions would not exceed Level B thresholds, impacts from construction-generated air pollutants would be *less than significant*.

Mitigation Measures:

MM 5.2-1: Prior to issuance of a grading permit, the project applicant shall submit a grading plan for review and approval by the City of Redding Development Services Department. The following specifications shall be included to reduce short-term air quality impacts attributable to the onsite and offsite construction activities identified in Section 3.0, PROJECT DESCRIPTION, and improvements noted in **MM 5.14-1** through **MM 5.14-4** in Section 5.14, TRAFFIC AND CIRCULATION:

- During all construction activities, all diesel-fueled construction equipment, including but not limited to rubber-tired dozers, graders, scrapers, excavators, asphalt paving equipment, cranes, and tractors, shall be California Air Resources Board (CARB) Tier 4 interim or better as set forth in Section 2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 of the Code of Federal Regulations.[12]

- During all construction activities, all architectural coatings applied shall contain a low content of volatile organic compounds (VOC) (i.e., 100 grams/liter) as required by the Green Building Code and as adopted by the City of Redding.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. Equipment maintenance records shall be kept onsite and made available upon request by the City of Redding or Shasta County AQMD.

- All material excavated, stockpiled, or graded shall be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering shall occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.

- All unpaved areas (including unpaved roads) with vehicle traffic shall be watered periodically or have dust palliatives applied for stabilization of dust emissions.

- All onsite vehicles shall be limited to a speed of 15 miles per hour on unpaved roads.

- All land clearing, grading, earth-moving, or excavation activities on the project site shall be suspended when sustained winds are expected to exceed 20 miles per hour.

- All portions of the development site which have been stripped of vegetation by construction activities and left inactive for more than ten days shall be seeded and/or watered until a suitable grass cover is established.

- All trucks hauling dirt, sand, soil, or loose material shall be covered or shall maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and the trailer) in accordance with the requirements of California Vehicle Code Section 23114. This provision will be enforced by local law enforcement agencies.

[12] NOx emissions are primarily associated with use of diesel-powered construction equipment (e.g., graders, excavators, rubber-tired dozers, tractor/loader/backhoes). The Clean Air Act of 1990 directed the EPA to study, and regulate if warranted, the contribution of off-road internal combustion engines to urban air pollution. The first federal standards (Tier 1) for new off-road diesel engines were adopted in 1994 for engines over 50 horsepower and were phased in from 1996 to 2000. In 1996, a Statement of Principles pertaining to off-road diesel engines was signed between the EPA, CARB, and engine makers (including Caterpillar, Cummins, Deere, Detroit Diesel, Deutz, Isuzu, Komatsu, Kubota, Mitsubishi, Navistar, New Holland, Wis-Con, and Yanmar). On August 27, 1998, the EPA signed the final rule reflecting the provisions of the Statement of Principles. The 1998 regulation introduced Tier 1 standards for equipment under 50 horsepower and increasingly more stringent Tier 2 and Tier 3 standards for all equipment with phase-in schedules from 2000 to 2008. As a result, all off-road, diesel-fueled construction equipment manufactured in 2006 or later has been manufactured to Tier 3 standards. Equipment manufactured in 2015 or later has been manufactured to Tier 4 standards.

- All material transported offsite shall be either sufficiently watered or securely covered to prevent a public nuisance.

- Wheel washers shall be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip.

- Prior to final occupancy, the applicant shall re-establish ground cover on the construction site through seeding and watering.

- Off-road construction equipment shall not be left idling for periods longer than 5 minutes when not in use.

Level of Significance After Mitigation: *Less than significant* impact with mitigation incorporated.

IMPACT 5.2-3	***Project implementation could potentially violate an air quality standard or contribute substantially to an existing or projected air quality violation during project operations.***

Significance: Potentially Significant Impact.

Impact Analysis: Subsequent land use activities associated with implementation of the proposed project would introduce additional mobile and stationary sources of emissions, which would adversely affect regional air quality.

The proposed project would result in increased regional emissions of PM_{10} and $PM_{2.5}$, as well as ROG, NO_X, and CO, due to increased use of motor vehicles, natural gas, maintenance equipment, and various consumer products, thereby increasing potential operational air quality impacts. Increases in operational air impacts with the proposed project would generally consist of three sources: stationary, energy, and mobile. Area sources are defined as fireplaces, consumer products, area architectural coatings, and landscaping equipment. Energy sources include natural gas emission variables, and mobile sources include automobiles.

The proposed project would result in approximately 4,697 trips during the weekday and 2,414 of which would be generated by customers visiting the medical office building. It is assumed each customer visiting the site would generate two trips per day – one trip to the site, and one trip from the site. Therefore, it is estimated that the project site would serve 1,207 customers during the average weekday. Maximum daily operational emissions are summarized in Table 5.2-8, LONG-TERM UNMITIGATED OPERATIONAL EMISSIONS.

As depicted in Table 5.2-8, emissions associated with operations of the proposed project would exceed Level A significance thresholds for NO_X mobile source emissions. The SCAQMD recommends that projects apply SMM and appropriate BAMM when a project exceeds Level A thresholds. Projects with emissions levels below the Level B thresholds are considered *less than significant*.

Table 5.2-8
LONG-TERM UNMITIGATED OPERATIONAL EMISSIONS

Source	Pollutant (pounds/day)[1, 2]				
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)
Summer Emissions					
Area Source	3.73	0.0006	0.0002	0.0002	0.07
Energy Use	0.05	0.46	0.03	0.03	0.38
Mobile Source	12.37	79.77	32.68	9.01	120.9
Stationary Source	6.60	0.51	0.04	0.04	17.18
Total	**19.72**	**83.44**	**32.75**	**9.09**	**126.91**
Winter Emissions					
Area Source	3.73	0.0006	0.0002	0.0002	0.07
Energy Use	0.05	0.46	0.03	0.03	0.38
Mobile Source	9.34	82.48	32.68	9.02	109.27
Stationary Source	6.60	0.51	0.04	0.04	17.19
Total	**19.72**	**83.44**	**32.75**	**9.09**	**126.91**
Potentially Significant Impact Threshold (Daily Emissions)	**25/137**	**25/137**	**80/137**	**None**	**None**
Exceed Daily Threshold?	**No/No**	**Yes/No**	**No/No**	**NA**	**NA**

Notes:
1. Emissions calculated using CalEEMod version 2016.3.2.
2. Mobile-source emissions projections account for approximately 4,697 weekday trips per the *Traffic Impact Analysis Report* (refer to Appendix 15.11).

Refer to Appendix 15.2, AIR QUALITY DATA, for daily emission model outputs.

The project also includes greenhouse gas (GHG) emissions mitigation measures (refer to **MM 5.6-1** in Section 5.6, GREENHOUSE GASES AND CLIMATE CHANGE) and project design features that would also reduce criteria pollutant emissions. The proposed project site is located approximately 0.83-miles from a Strategic Growth Area, as shown in the 2015 RTP/SCS and approximately 1.5-miles from the Redding Area Bus Authority (RABA) Downtown Transfer Station. The proposed project would also improve the pedestrian network onsite and on adjacent roadways. Mitigation Measure **MM 5.6-1** requires the applicant to prepare and implement a Greenhouse Gas Reduction Plan (GGRP) to be implemented prior to 2035 and quantify emission reductions associated with specific design features and actions. Additionally, **MM 5.6-1** requires implementation of voluntary trip reduction program as well as a voluntary ride-sharing program for all employees. The proposed project would be constructed to comply with the 2016 Title 24 Building Codes, which result in a 5 percent increase in energy efficiency in commercial buildings when compared with the 2013 Title 24 Building Codes. An increase in building energy efficiency results in a reduction of pollutant emissions. Other measures may include renewable energy, electric lawnmowers and leaf blowers, or purchasing greenhouse gas offsets. However, there is no certainty that the number of vehicle trips would be sufficiently lowered by these best management practices to reduce vehicle NO_x emissions. Table 5.2-9, LONG-TERM MITIGATED OPERATIONAL EMISSIONS, shows the operational criteria pollutant emissions with the implementation of **MM 5.6-1**.

Table 5.2-9
LONG-TERM MITIGATED OPERATIONAL EMISSIONS

Source	Pollutant (pounds/day)[1, 2]				
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)
Summer Emissions					
Area Source	3.73	0.0006	0.0003	0.0003	0.07
Energy Use	0.05	0.46	0.3	0.03	0.38
Mobile Source[3]	11.31	70.98	24.79	6.84	96.44
Stationary Source	6.60	0.51	0.04	0.04	17.19
Total	**21.69**	**71.94**	**24.86**	**6.92**	**114.08**
Winter Emissions					
Area Source	3.73	0.0006	0.0003	0.0003	0.07
Energy Use	0.05	0.46	0.03	0.03	0.38
Mobile Source[3]	8.34	72.76	15.23	6.85	89.97
Stationary Source	6.60	0.51	0.18	0.04	17.19
Total	**18.72**	**73.73**	**15.23**	**6.92**	**107.6**
Potentially Significant Impact Threshold (Daily Emissions)	**25/137**	**25/137**	**80/137**	**None**	**None**
Exceed Daily Threshold?	**No/No**	**Yes/No**	**No/No**	**NA**	**NA**

Notes:
1. Emissions calculated using CalEEMod version 2016.3.2.
2. Mobile-source emissions projections account for approximately 4,697 weekday trips per the *Traffic Impact Analysis Report* (refer to Appendix 15.11).

Refer to Appendix 15.2, AIR QUALITY DATA, for daily emission model outputs.

Project emissions would be below the Level B significance threshold but would exceed Level A significance thresholds for NO_X. Therefore, the project would be considered *less than significant* with implementation of **MM 5.6-1,** which represents the feasible SMMs and appropriate BAMMs for the project (required when a project exceeds Level A thresholds).

Combined Construction and Operational Emissions

As noted above, the project would be constructed in two phases. Phase 1 is projected to be completed by the end of 2021. Therefore, the potential exists that Phase 1 could be operational while Phase 2 is being constructed. Table 5.2-10, PHASE 1 OPERATIONAL AND PHASE 2 CONSTRUCTION EMISSIONS (MITIGATED), shows that under this scenario, the combined construction and operational emissions would not increase impacts beyond what is identified above. Table 5.2-10 shows that the project would exceed SCAQMD Level A thresholds for ROG and NO_X. However, Level B thresholds would not be exceeded. The potential overlap of construction and operational emissions would not change the magnitude of project emissions. It should be noted that Table 5.2-10 conservatively shows the total project operational emissions and not just Phase 1 operational emissions. Therefore, potential overlapping construction and operational emissions would be lower. Impacts would be *less than significan*t in this regard.

Table 5.2-10
PHASE 1 OPERATIONAL AND PHASE 2 CONSTRUCTION EMISSIONS (MITIGATED)

Source	Maximum Emissions (pounds per day)[1]				
	Reactive Organic Gases (ROG)	Nitrogen Oxide (NO_X)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)
Phase 1 Operational Emissions	9.20	66.34	20.26	5.69	83.09
Phase 2 Construction Year 2022	27.10	21.09	0.84	0.33	34.26
Total Combined Emissions	**36.3**	**87.43**	**21.1**	**6.02**	**117.35**
Threshold A	**25**	**25**	**80**	**None**	**None**
Threshold B	**137**	**137**	**137**	**None**	**None**
Exceed Level A Threshold?	Yes	Yes	No	N/A	N/A
Exceed Level B Threshold?	No	No	No	N/A	N/A

Notes:
1. Emissions calculated using CalEEMod version 2016.3.2. Worst-case season emissions.

Refer to Appendix 15.2, AIR QUALITY DATA, for daily emission model outputs.

Criteria Pollutant Health Impacts

On December 24, 2018, the California Supreme Court issued an opinion identifying the need to provide sufficient information connecting a project's air emissions to health impacts or explain why such information could not be ascertained (Sierra Club v. County of Fresno [Friant Ranch, L.P.] [2018] Cal.5th, Case No. S219783). The SCAQMD has set its CEQA significance thresholds based on the FCAA, which defines a major stationary source as emitting 25 tons per year of NO_X or VOC (i.e., Level B thresholds). Emissions below this level are small enough to not have a regional impact on ambient ozone levels may not be detected in the regional air quality models that are currently used to determine ozone levels. As previously discussed, the proposed project, representing a 129,600 square-foot wellness campus, is considered relatively small (i.e., not a Specific Plan or other large land development project) and project emissions would be *less than significant* and would not exceed SCAQMD Level B thresholds (refer to Table 5.2-7 through Table 5.2-10). Therefore, the proposed project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation and no criteria pollutant health impacts would occur. Project operational emissions would be *less than significant*.

Mitigation Measures: Implement **MM 5.6-1** in Section 5.6, GREENHOUSE GASES AND CLIMATE CHANGE.

Level of Significance After Mitigation: *Less than significant* impact with mitigation incorporated.

IMPACT 5.2-4 *Project implementation would not expose sensitive receptors to substantial carbon monoxide pollutant concentrations.*

Significance: Less Than Significant Impact.

Impact Analysis: It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the

high traffic volume potential, areas of high CO concentrations, or "hot spots," are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours.[13] However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. Currently, the CO standard in California is a maximum of 3.4 grams per mile for passenger cars (requirements for certain vehicles are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the project vicinity have steadily declined.

Accordingly, with the steadily decreasing CO emissions from vehicles, even very busy intersections do not result in exceedances of the CO standard. As discussed previously and shown in Table 5.2-2, Shasta County is in attainment for CO and concentrations in the area have historically been low, and well within compliance with both state and federal ambient air quality standards. As such, the SCAQMD does not require the analysis of CO hotspots. The overall effect in the County is that CO concentrations remain relatively low, and it is not anticipated that CO from project traffic would generate a CO hotspot. The following qualitative analysis is presented to support the conclusion that CO impacts from the project are highly unlikely to result in a CO hotspot or a violation of any CO ambient air quality standard.

The analysis prepared for CO attainment in the South Coast Air Quality Management District *1992 Federal Attainment Plan for Carbon Monoxide* (1992 CO Plan) in Southern California can be used to assist in evaluating the potential for CO exceedances.[14] The CO hot spot analysis was conducted for four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was that at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. The Los Angeles County Metropolitan Transportation Authority evaluated the level of service in the vicinity of the Wilshire Boulevard/Veteran Avenue intersection and found it to be level of service (LOS) E at peak morning traffic and LOS F at peak afternoon traffic. Nonetheless, the analysis concluded that there was no violation of CO standards.[15]

According to the project's *Traffic Impact Analysis Report,* the proposed project would result in approximately 4,697 weekday trips of which 2,414 trips are generated by customers. Therefore, the proposed project would not increase traffic volumes at any intersection to more than 100,000 vehicles per day, the value studied in the 1992 CO Plan. The project would not create a CO hotspot at any intersections near sensitive receptors or near any project study intersections. As a result, this impact would be considered *less than significant*.

Mitigation Measures: No mitigation measures are required.

[13] Level of service (LOS) is a measure used by traffic engineers to determine the effectiveness of transportation infrastructure. LOS is most commonly used to analyze intersections by categorizing traffic flow with corresponding safe driving conditions. LOS A is considered the most efficient level of service and LOS F the least efficient.

[14] It is noted that Shasta County is designated as "Unclassified/Attainment" for CO for both Federal and State ambient air quality standards. Therefore, a CO attainment analysis has not been conducted for Shasta County; thus, the *1992 Federal Attainment Plan for Carbon Monoxide* was utilized for analysis purposes.

[15] *1992 Federal Attainment Plan for Carbon Monoxide,* South Coast Air Quality Management District, 1992.

Level of Significance After Mitigation: No mitigation measures are required. Impacts would be *less than significant*.

IMPACT 5.2-5	***Implementation of the proposed project could potentially expose sensitive receptors to substantial toxic air contaminant concentrations during project construction.***

Significance: Potentially Significant Impact.

Impact Analysis: Construction equipment and associated heavy-duty truck traffic generate diesel exhaust, which is a known toxic air contaminants (TAC). Diesel exhaust from construction equipment operating at the site poses a health risk to nearby sensitive receptors. An incremental cancer risk of greater than 10 cases per million at the Maximally Exposed Individual (MEI) will result in a significant impact. The significance threshold for non-cancer hazards is 1.0.

Construction-related activities would result in project-generated emissions of diesel particulate matter (DPM) from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., demolition, clearing, grading); paving; application of architectural coatings; on-road truck travel; and other miscellaneous activities. For construction activity, DPM is the primary toxic air contaminant of concern. On-road diesel-powered haul trucks traveling to and from the construction area to deliver materials and equipment are less of a concern because they would not stay on the site for long durations. Diesel exhaust from construction equipment operating at the site poses a health risk to nearby sensitive receptors. The closest sensitive receptor to the project site are the residences adjacent to the south of the project site. The next closest sensitive receptors are residences located 1,100 feet east.

Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer. The use of diesel-powered construction equipment would be episodic and would occur throughout the site. Additionally, construction activities would be subject to and would comply with California regulations limiting idling to no more than 5 minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable diesel PM emissions. Furthermore, even during the most intense year of construction, emissions of diesel PM would be generated from different locations on the project site rather than in a single location because different types of construction activities (e.g., site preparation and building construction) would not occur at the same place at the same time.

The air dispersion modeling for the construction risk assessment was performed using the U.S. EPA AERMOD model. AERMOD is a steady-state, multiple-source, Gaussian dispersion model designed for use with emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources (not a factor in this case). AERMOD requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. Surface and upper air meteorological data was obtained from CARB. Surface and upper air meteorological data from the Redding Municipal Airport Monitoring Station was selected as being the most representative for meteorology based on proximity to the project site.

Maximum (worst case) PM_{10} exhaust construction emissions over the entire construction period were used in AERMOD to approximate construction DPM emissions. Risk levels were calculated according to the California Office of Environmental Health Hazard Assessment (OEHHA) guidance document, *Air Toxics Hot Spots Program Risk Assessment Guidelines* (February 2015).

PM_{10} construction emissions rates in grams per second were calculated from the total annual mitigated onsite exhaust emissions reported in CalEEMod (0.016 tons in Phase 1, 2020, and 0.0127 tons per year in Phase 2, 2022). It should be noted that although construction Phase 1 and Phase 2 would span over multiple years, the modeling conservatively uses the year with the highest emission for each phase. Annual emissions were converted to grams per second and these emissions rates were input into AERMOD. Results of this assessment are summarized in Table 5.2-11, CONSTRUCTION RISK.

Table 5.2-11
CONSTRUCTION RISK

Construction Phase	Pollutant Concentration (µg/m³)	Maximum Cancer Risk (Risk per Million)	Chronic Noncancer Hazard	Acute Noncancer Hazard
Phase 1	0.031	4.26	0.006	0.12
Phase 2	0.003	0.25	0.001	0.01
Threshold	*N/A*	*10 in one million*	*1*	*1*
Threshold Exceeded?	**N/A**	**No**	**No**	**No**

Refer to Appendix 15.2, AIR QUALITY DATA, for model outputs and calculations.

As shown in Table 5.2-11, the maximum (onsite and offsite) concentration of PM_{10} during construction would occur offsite adjacent to the southeastern project bound and would be 0.031 µg/m³ during Phase 1 and 0.003 µg/m³ during Phase 2. These levels represent the highest worst-case concentrations. Concentrations would be lower at all other location surrounding the project site. The highest calculated carcinogenic risk for offsite receptors from project construction would be 4.26 per million and 0.25 per million for Phase 1 and Phase 2, respectively. The risk calculation utilized a construction exposure duration for Phase 1 and Phase 2 of 18 months and 12 months, respectively. Breathing rates were weighted based on OEHHA 95th percentile values for of 3 months at 361 liters/kilogram and the remaining time at 1,090 liters/kilogram). Acute and chronic non-cancer hazards for DPM would be below the 1.0 threshold. As described above, worst-case construction risk levels and conservative assumptions would be below the applicable thresholds. Therefore, construction risk impacts would be *less than significant.*

Mitigation Measures: Implement **MM 5.2-1**.

Level of Significance After Mitigation: *Less than significant* impact with mitigation incorporated.

IMPACT 5.2-6 ***Project implementation would not expose sensitive receptors to substantial toxic air contaminant concentrations during project operations.***

Significance: Less Than Significant Impact.

Impact Analysis: Project operations would potentially occur from the three emergency diesel backup generators as well as delivery trucks accessing the project site. Emergency backup generators are regulated by SCAQMD and typically have testing and maintenance limited to 100 hours per year, per

Shasta County AQMD Rule 3-28. It is assumed that each generator would be a 500-horsepower diesel generator and operate a maximum of 30 minutes per day when tested, and up to 50 hours for testing annually.

Emergency backup generator emissions were estimated with CalEEMod. Generator horsepower, fuel, and operating duration were input into the model. Vehicle DPM emissions were estimated using the 2017 version of the EMission FACtor model (EMFAC) developed by CARB. EMFAC is a mathematical model that was developed to calculate emission rates from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by CARB to project changes in future emissions from on-road mobile sources. EMFAC2017, incorporates regional motor vehicle data, information and estimates regarding the distribution of vehicle miles traveled (VMT) by speed, and number of starts per day. The model includes the emissions benefits of the truck and bus rule and the previously adopted rules for other on-road diesel equipment. PM_{10} emissions were used as a proxy for DPM.

Vehicle sources modeled as a line volume source (comprised of adjacent volume sources) for loading idling areas and truck circulation/routes. AERMOD was run to obtain the annual average concentration in micrograms per cubic meter [$\mu g/m^3$] of PM_{10} at nearby sensitive receptors. Due to the location and spacing of the nearby sensitive receptors in the project area, receptors were modeled with a 20-meter grid spacing. In addition, National Elevation Dataset (NED) terrain data was imported into AERMOD for the project area.

Note that the concentration estimate developed using this methodology is considered conservative and is not a specific prediction of the actual concentrations that would occur at the project site any one point in time. Actual 1-hour and annual average concentrations are dependent on many variables, particularly the number and type of equipment working at specific distances during time periods of adverse meteorology.

A health risk computation was performed to determine the risk of developing an excess cancer risk calculated on a 70-year lifetime basis exposure scenarios. The cancer risk calculations were based on applying age sensitivity weighting factors for each emissions period modeled. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. The chronic and carcinogenic health risk calculations are based on the standardized equations contained in the OEHHA Guidance Manual. Only the risk associated with the worst-case location of the proposed project was assessed.

Based on the AERMOD outputs, the highest expected hourly average diesel PM_{10} emission concentrations from project operations would be 0.014 $\mu g/m^3$. The highest expected annual average diesel PM_{10} emission concentrations would occur along the southern boundary of the project site and would be 0.0009 $\mu g/m^3$. The calculations conservatively assume no cleaner technology with lower emissions in future years. The highest calculated carcinogenic risk from project operations would be 0.71 per million. This represents the worst-case sensitive receptor location. Additionally, acute and chronic hazards would be 0.0002 and 0.006, respectively, which are below the hazard index threshold of 1.0. Therefore, impacts related to cancer risk and hazards from mobile sources would be *less than significant* at the project site.

Combined Construction and Operational Impacts

As noted above, the project would be constructed in two phases and Phase 1 is projected to be completed while Phase 2 is being constructed. Impact 5.2-5 identifies a maximum cancer risk of 0.25 in one million associated with Phase 2 construction emissions, which is below the 10 in one million threshold. The maximum risk is based on the highest pollutant concentration modeled (including on- and offsite locations). Additionally, chronic and acute impacts would be *less than significant*. The cancer risk calculation is based on a residential exposure scenario. Therefore, worker exposure associated with operations of Phase 1 would be lower. As a result, Phase 2 construction emissions would not exacerbate any existing air pollution concentrations and would not result in health-related effects on the users of Phase 1.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts would be *less than significant*.

IMPACT 5.2-7 ***Project implementation would not create objectionable odors affecting a substantial number of people.***

Significance: Less Than Significant Impact.

Impact Analysis: Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Land uses commonly considered to be potential sources of odorous emissions include wastewater treatment plants, sanitary landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants. The proposed project does not include any of these odorous uses and would not generate odors that would be noticeable at any of the surrounding sensitive receptors. Therefore, impacts in this regard would be *less than significant*.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts would be *less than significant*.

5.2.5 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

The geographic extent of the cumulative impacts analysis for air quality is the same as the extent of the regional setting, as described in Subsection 5.2.1, *Environmental Setting*. That extent is defined as the Shasta County portion of the NSVAB. This represents the geographic limit for cumulative air quality since air emissions have a regional effect. The Shasta County portion of the NSVAB is designated as a nonattainment area for O_3 and PM_{10} for state standards. The Shasta County portion of the NSVAB is designated as being unclassified and/or attainment for all pollutants under federal standards. Cumulative growth in population, vehicle use, and industrial activity could inhibit efforts to improve regional air quality and attain the ambient air quality standards.

Section 4.0, BASIS OF CUMULATIVE ANALYSIS, of this EIR describes the details cumulative projects within the general geographic scope of the proposed project. Developments that are currently under construction or proposed in the vicinity of the project site in the City are listed in Table 4-1, CUMULATIVE PROJECTS CONSIDERED.

IMPACT 5.2-8	***Implementation of the proposed project, along with foreseeable development in the project vicinity, could potentially conflict with or obstruct implementation of the 2015 Air Quality Attainment Plan.***

Significance: Potentially Significant Impact.

Impact Analysis: Because of the region's nonattainment status for ozone and PM_{10}, if a project generates ozone-precursor pollutants (i.e., ROG and NO_X) or PM_{10} in quantities that would be considered to result in significant air quality impacts under individual project conditions, the project's cumulative impacts would be considered significant as well. The SCAQMD recommends that SMM be applied to all projects regardless of the extent of air quality impacts in order to reduce cumulative impacts. This approach reduces overall emissions caused by cumulative impacts and also reduces the likelihood that large projects will need to carry a larger burden of mitigation. As discussed previously, implementation of **MM 5.2-1**, which includes feasible operations-related SMM and appropriate BAMM, would be implemented per SCAQMD guidance. The SCAQMD uses the threshold level of the New Source Review Rule, which is 25 tons per year or 137 pounds per day to gauge cumulative impacts. This threshold coincides with the Level B thresholds. Therefore, the Level B threshold serves as a level of significance for large and cumulative effects of several small projects.

While the proposed project's emissions would be below SCAQMD thresholds, the project potentially conflicts with the *2015 Air Quality Attainment Plan* cumulative ozone precursor impacts since the *Air Quality Attainment Plan* addresses ozone precursor pollutants in the NSVAB. The proposed project would conflict with implementation of the *2015 Air Quality Attainment Plan* by resulting in an increase of ozone precursor emissions. Even with compliance with SMMs and BAMMs provided in **MM 5.2-1**, the project's incremental contribution to a significant regional cumulative impact is considerable. Therefore, impacts are cumulatively *significant and unavoidable*.

Mitigation Measures: Implement **MM 5.2-1**, as described above.

Level of Significance After Mitigation: Impacts related to implementation of the *2015 Air Quality Attainment Plan* would be cumulatively *significant and unavoidable*.

IMPACT 5.2-9	***Implementation of the proposed project, along with foreseeable development in the project vicinity, could potentially violate an air quality standard or contribute substantially to an existing or projected air quality violation during project construction.***

Significance: Potentially Significant Impact.

Impact Analysis: The SCAQMD's approach to mitigating construction related impacts is to implement the SMMs and BAMMs, which requires reasonable precaution to control ROG, NO_X or PM_{10} during construction activities. As discussed previously, construction-generated emissions associated with the development of the proposed project would not exceed the SCAQMD Level B significance threshold, and while the Level A significance threshold would be surpassed for ROG and NO_X emissions, feasible SMM and appropriate BAMM would be implemented per SCAQMD guidance as required by **MM 5.2-1**. As a result, impacts from construction-generated air pollutants would be considered less than significant.

The SCAQMD significance thresholds for construction are intended to meet the objectives of the Air Quality Attainment Plan to ensure the Federal and California NAAQS are not exceeded. As the project Applicant has no control over the timing or sequencing of the related projects, any quantitative analysis to ascertain the daily construction emissions that assumes multiple, concurrent construction would be speculative. In addition, construction-related criteria pollutant emissions are temporary in nature and cease following project completion. Project compliance with SCAQMD rules and regulations and **MM 5.2-1** would reduce construction-related impacts to *less than significant* levels. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (e.g., Rule compliance, the implementation of all feasible mitigation measures, and compliance with adopted *2015 Air Quality Attainment Plan* emissions control measures) would also be imposed on construction projects throughout the NSVAB, which would include each of the related projects listed in Section 4.0, BASIS OF CUMULATIVE ANALYSIS. Therefore, as cumulative projects would be required to reduce their emissions per SCAQMD rules and mandates, cumulative construction emissions would not contribute to an exceedance of the Federal or California NAAQS and would, therefore, comply with the goals of the *2015 Air Quality Attainment Plan*. Thus, it can be reasonably inferred that the project-related construction activities, in combination with those from other projects

in the area, would not deteriorate the local air quality and would not result in cumulative construction-related impacts.

Mitigation Measures: Implement **MM 5.2-1**, as described above.

Level of Significance After Mitigation: Through implementation and compliance with **MM 5.2-1**, the proposed project's incremental contribution to air quality violations would be *less than cumulatively considerable*. Successful implementation of **MM 5.2-1**, combined with individual environmental reviews and adherence with applicable requirements of the SCAQMD, on a project-by-project basis, would result in cumulatively *less than significant* impacts.

IMPACT 5.2-10	***Implementation of the proposed project, along with foreseeable development in the project vicinity, could potentially violate an air quality standard or contribute substantially to an existing or projected air quality violation during project operations.***

Significance: Potentially Significant Impact.

Impact Analysis: The SCAQMD's approach to mitigating operational related impacts is to implement the SMMs and BAMMs, which requires reasonable precaution to control operational ROG, NO_X or PM_{10} emissions. As discussed previously, project operational emissions would be below the Level B significance threshold but would exceed Level A significance thresholds for NO_X. Therefore, feasible SMMs and appropriate BAMMs are required. Adherence to Air Quality Attainment Plan control measures (i.e., SMMs and BAMMs) would ensure that the proposed project and related development projects in the City would alleviate potential impacts related to cumulative conditions on a project-by-project basis. The proposed project's operational impacts would be considered *less than significant* with implementation of **MM 5.2-1**, which represents the feasible SMMs and appropriate BAMMs for the project. Thus, project-related operational activities, in combination with those from other projects in the area, would not deteriorate the local air quality and would not result in cumulative operational impacts.

Mitigation Measures: Implement **MM 5.2-1**, as described above

Level of Significance After Mitigation: Through implementation and compliance with **MM 5.2-1**, the proposed project's incremental contribution to air quality violations would be *less than cumulatively considerable*. Successful implementation of **MM 5.2-1**, combined with individual environmental reviews and adherence with applicable requirements of the SCAQMD, on a project-by-project basis, would result in cumulatively *less than significant* impacts.

IMPACT 5.2-11	***Implementation of the proposed project, along with foreseeable development in the project vicinity, would not expose sensitive receptors to substantial carbon monoxide pollutant concentrations.***

Significance: Less Than Significant Impact.

Impact Analysis: As discussed previously, Shasta County is in attainment for CO and concentrations in the area have historically been low, and well within compliance with both state and federal ambient air quality standards. As analyzed above, the project would not create a CO hotspot at any intersections near sensitive receptors or near any project study intersections. As transport of CO is extremely limited and it disperses rapidly with distance from the source under normal meteorological conditions, this potential impact is not cumulatively considerable and would not be expected to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative impact related to exposing sensitive receptors to substantial carbon monoxide pollutant concentrations.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts related to exposing sensitive receptors to substantial carbon monoxide pollutant concentrations would be cumulatively *less than significant*.

IMPACT 5.2-12	***Implementation of the proposed project, along with foreseeable development in the project vicinity, would not potentially expose sensitive receptors to substantial toxic air contaminant concentrations during project construction.***

Significance: Less Than Significant Impact.

Impact Analysis: As discussed in Impact 5.2-5, above, worst-case project construction risk levels would be *less than significant*. The SCAQMD's risk threshold represents an incremental increase from a project because an incremental increase greater than 10 in 1 million could conflict with plans and programs to reduce TAC exposure in the NSVAB. The SCAQMD's Toxics Health Risk Assessment Policy requires new and modified TAC sources to be designed to minimize emissions through the use of Toxic Best Available Control Technology (T-BACT). Additionally, there are no other (existing or proposed) TAC sources (e.g., gas stations, distribution facilities, rail yards, etc.) in the project area (i.e., within 1,000 feet). This potential impact is not cumulatively considerable and would not be expected to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative impact related to exposing sensitive receptors to substantial toxic air contaminant concentrations during project construction.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts related to exposing sensitive receptors to substantial toxic air contaminant concentrations during project construction would be cumulatively *less than significant*.

IMPACT 5.2-13	***Implementation of the proposed project, along with foreseeable development in the project vicinity, would not expose sensitive receptors to substantial toxic air contaminant concentrations during project operations.***

Significance: Less Than Significant Impact.

Impact Analysis: As discussed in Impact 5.2-6, above, worst-case project operational risk levels would be *less than significant*. As the project would not result in an incremental risk, it would not represent an increase greater that could conflict with plans and programs to reduce TAC exposure in the NSVAB. The SCAQMD's Toxics Health Risk Assessment Policy requires new and modified TAC sources to be designed to minimize emissions through the use of Toxic Best Available Control Technology (T-BACT). Additionally, there are no other (existing or proposed) TAC sources (e.g., gas stations, distribution facilities, rail yards, etc.) in the project area (i.e., within 1,000 feet). This potential impact is not cumulatively considerable and would not be expected to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative impact related to exposing sensitive receptors to substantial toxic air contaminant concentrations during project operations.
Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts related to exposing sensitive receptors to substantial toxic air contaminant concentrations during project operation would be cumulatively *less than significant*.

IMPACT 5.2-14	***Implementation of the proposed project, along with foreseeable development in the project vicinity, would not create objectionable odors affecting a substantial number of people.***

Significance: Less Than Significant Impact.

Impact Analysis: As analyzed above in Impact 5.2-7, the proposed project does not include odorous uses and would not generate odors that would be noticeable at any of the surrounding sensitive receptors. This potential impact is not cumulatively considerable and would not be expected to combine with similar impacts of past, present, or reasonably foreseeable projects to result in a cumulative odor impact affecting a substantial number of people.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: No mitigation measures are required. Impacts related to the creation of objectionable odors would be cumulatively *less than significant*.