5.3 AIR QUALITY

NOTE TO READER: This section of the Partial Recirculated Draft EIR (RDEIR) includes an updated analysis of potential air quality impacts. This section was revised to update the analysis based upon updated methods of analysis, updated thresholds in Appendix G of the State CEQA Guidelines, and to reflect new legislation and regulations regarding air quality analysis. This section is recirculated in its entirety.

This section 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 (model outputs) is included in Appendix RDEIR-A-1, *Air Quality/Greenhouse Gas Emissions Data*.

5.3.1 ENVIRONMENTAL SETTING

NORTHERN SACRAMENTO VALLEY AIR BASIN

The proposed project is located five miles east of the City of Redding, between the unincorporated communities of Bella Vista and Palo Cedro, which is in Shasta County 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

[1] *Northern Sacramento Valley Planning Area 2018 Triennial Air Quality Attainment Plan,* Sacramento Valley Air Quality Engineering and Enforcement Professionals, 2018.

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 5.3-1, CRITERIA AIR POLLUTANTS SUMMARY OF COMMON SOURCES AND EFFECTS.

Table 5.3-1
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)	Formed by a chemical reaction between volatile organic compounds (VOC) and nitrous oxides (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 ships.	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: CAPCOA (California Air Pollution Control Officers Association). 2013. Health Effects. [online]: *http://www.capcoa.org/health-effects/*. Accessed on January 14, 2016.

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 air quality management districts experience transport ozone from the Broader Sacramento Area, which comprise all of the Sacramento Metropolitan Air Quality Management District (AQMD) and 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. The California Air Resources Board (CARB) has also identified that air pollution is transported from the Broader Sacramento Area to the Upper Sacramento Valley.[3] 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 counties. 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 reduced by increasingly stringent motor vehicle emission controls and cleaner burning gasoline.[4]

AMBIENT AIR QUALITY

Criteria Air Pollutant Monitoring Data

Ambient air quality in Shasta County, 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 7 miles west of the project site. Table 5.3-2, AMBIENT AIR QUALITY MONITORING DATA, summarizes the published data since 2016 for each year that the monitoring data is provided.

[2] U.S., Environmental Protection Agency, *Ground-Level Ozone Basics*, 2018. Available at: https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics; accessed on February 12, 2019.
[3] California Air Resources Board, *Ozone Transport: 2001 Review*, April 2001.
[4] Ibid.

Table 5.3-2
AMBIENT AIR QUALITY MONITORING DATA

Pollutant Standards	2016[1]	2017[1]	2018[1]
Ozone (O_3)			
1-hour Maximum Concentration (ppm)	0.084	0.082	0.089
8-hour Maximum Concentration (ppm)	0.074	0.075	0.077
Number of Days Standard Exceeded			
CAAQS 1-hour (>0.09 ppm)	0	0	0
NAAQS 8-hour (>0.070 ppm)	5	3	1
Particulate Matter Less Than 10 Microns (PM_{10})			
National 24-hour Maximum Concentration	28.4	88.9	166.1
State 24-hour Maximum Concentration	27.6	84.8	160.5
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 µg/m3)	0	0	1
CAAQS 24-hour (>50 µg/m3)	0	2	7
Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$)			
National 24-hour Maximum Concentration	12.6	67.3	131.0
State 24-hour Maximum Concentration	12.6	67.3	131.0
Number of Days Standard Exceeded			
NAAQS 24-hour (>35 µg/m3)	0	1	5

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

Source: California Air Resources Board, *Aerometric Data Analysis and Management System (ADAM) Air Quality Data Statistics,* 2020. [online]: http://www.arb.ca.gov/adam/index.html. Accessed on January 17, 2020.

Notes:

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

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 believed 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. 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. To date, CARB has designated nearly 200 compounds as TACs. 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 a relatively few compounds.

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.[5] 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.

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases. Residential areas are 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.[6] 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 large-lot single family homes. The nearest residential land uses would be those surrounding the project site on the western and southern boundaries. No schools, hospitals, or senior care homes exist in the immediate area.

5.3.2 REGULATORY SETTING

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). 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

[5] EPA (U.S. Environmental Protection Agency). 2002. *Health Assessment Document for Diesel Engine Exhaust.* [online]: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060. Accessed on January 14, 2016.
[6] OEHHA (Office of Environmental Health Hazard Assessment). 2007. *Air Toxicology and Epidemiology: Air Pollution and Children's Health*. [online]: http://oehha.ca.gov/public_info/facts/airkids.html. Accessed on January 14, 2016.

the air district to achieve the NAAQS and CAAQS. As shown in Table 5.3-3, AIR QUALITY STANDARDS, these pollutants include O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. 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.

Table 5.3-3
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

Source: California Air Resources Board, Ambient Air Quality Standards, 2016. [online]: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed on January 17, 2020.
mg/m^3=milligrams per cubic meter; ppm=parts per million; ppb=parts per billion; µg/m^3=micrograms per cubic meter

Air Quality Attainment Plans

In 1994, the air districts in the 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, 2015 and again in 2018. Like the preceding plans, the 2018 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 2018 plan also addresses the effect that pollutant transport has on the NSVPA's ability to meet and attain the state standards.

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 5.3-4, FEDERAL AND STATE AMBIENT AIR QUALITY ATTAINMENT STATUS FOR SHASTA COUNTY. The region is nonattainment for the state ozone standard.

Table 5.3-4
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	Attainment
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*, 2018. [online]: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed on January 17, 2020.

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.[7] 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

[7] CARB (California Air Resources Board). 1999. *Final Staff Report: Update to the Toxic Air Contaminant List*.

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.

LOCAL

Shasta County Air Quality Management District (SCAQMD)

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 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 3:15, Cutback and Emulsified Asphalt, requires cutback and emulsified asphalt application to 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 3:23, Fireplace and Solid Fuel Heating Device Usage, established emission and performance requirements equivalent to EPA Phase II devices for wood-heating devices used for the first time in existing buildings and those used in all new residential and commercial building projects constructed after March 1, 1994, within the boundaries of Shasta County.

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

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

- 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.

Shasta County General Plan

The *Shasta County General Plan*, as amended through September 2004, provides the following air quality objectives and policies relative to the proposed project:

- *AQ-1.* To protect and improve the County's air quality in accordance with Federal and State clean air laws in order to: (1) safeguard human health, and (2) minimize crop, plant, and property damage.

- *AQ-1a.* The County shall require builders/developers to limit fireplace installations in new development to low-emitting fireplaces conforming to a maximum emission limit of 7.5 grams per hour of total particulate matter by being equipped with an EPA-certified insert or by being individually certified to meet the above emission standard.

- *AQ-1d.* The County shall require residential development projects and projects categorized as sensitive receptors to be located an adequate distance from existing and potential sources of toxic emissions such as freeways, major arterial, industrial sites, and hazardous material locations.

- *AQ-2c.* Land use decisions, where feasible, should contribute to the improvement of air quality. New projects shall be required to reduce their respective air quality impacts to below levels of significance or proceed as indicated in Policy AQ-2e.

- *AQ-2d.* Shasta County shall ensure that air quality impacts identified during CEQA review are: (1) consistently and fairly mitigated, and (2) mitigation measures are feasible.

- *AQ-2e.* Shasta County will cooperate with the AQMD in assuring that new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year shall provide appropriate emission offsets. A comparable program which offsets indirect emissions of these pollutants exceeding 25 tons per year from development projects shall also be utilized to mitigate air pollution impacts. An Environmental Impact Report will be required for all projects that have unmitigated emissions of non-attainment pollutants exceeding 25 tons per year.

- *AQ-2f***.** Shasta County shall require appropriate Standard Mitigation Measures and Best Available Mitigation Measures on all discretionary land use applications as recommended by the AQMD in order to mitigate both direct and indirect emissions of non-attainment pollutants.

- *AQ-2g.* Significance thresholds as proposed by the AQMD for emissions shall be utilized when appropriate for: (1) Reactive Organic Gases (ROG) and Oxides of Nitrogen (NOx), both of which are precursors of ozone, and (2) inhalable particulate matter (PM10) in determining mitigation of air quality impacts.

- *AQ-4b.* The County's development standards shall require the paving of roads as a part of new development permits to the extent necessary to meet access and air quality objectives. These requirements shall be designed to help mitigate potentially significant adverse air quality impacts created by particulate emissions on both an individual and cumulative basis.

- *AQ-8a.* The County will encourage new development projects to reduce air quality impacts from area sources and energy consumption requirements for heating and cooling.

- *AQ-8b.* The County will encourage use of energy conservation features and low-emission equipment for all new residential and commercial development.

5.3.3 THRESHOLDS OF SIGNIFICANCE

SIGNIFICANCE CRITERIA

In accordance with the 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 5.3-1, 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 5.3-2, below.

- *Expose sensitive receptors to substantial pollutant concentrations.* Refer to Impact 5.3-3, below.

- *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.* Refer to Impact 5.3-4, below.

SCAQMD thresholds have been used to determine air quality impacts in this analysis. To assist in the evaluation of air quality impacts, the SCAQMD has 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 5.3-5, SHASTA COUNTY AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS OF SIGNIFICANCE.

Table 5.3-5
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: Shasta County Air Quality Management District.			

The SCAQMD and the Shasta County 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. Projects that cannot mitigate emissions to levels below the Level B thresholds are considered significant.

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.

5.3.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

METHODOLOGY

Air quality impacts were assessed in accordance with methodologies recommended by CARB and the SCAQMD. 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.

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 (diesel PM) are the primary TAC of concern. Land uses that generate substantial amounts of diesel PM 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. Therefore, a formal health risk assessment was not conducted for this EIR.

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

IMPACT 5.3-1 ***Implementation of the proposed project would not conflict with or obstruct implementation of the applicable air quality plan.***

Significance: Less Than Significant Impact.

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 the state ozone standard (refer to Table 5.3-4).

The NSVPA *2018 Air Quality Attainment Plan* is the most recent and the only applicable air quality planning document covering Shasta County.[8] 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 *2018 Air Quality Attainment Plan* includes forecast ROG and NOX 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 *2018 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 *2018 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 *2018 Air Quality Attainment Plan* 2020 ozone precursor emissions projections.

The NSVPA *2018 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 Analysis 5.3-2, 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 *2018 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 *2018 Air Quality Attainment Plan*).

However, while operation of the project would result in an increase of O_3 precursor emissions, this increase would only total approximately 0.008 tons of ROG and 0.013 tons of NO_X daily (refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA). The addition of these project emissions to the area and mobile source projections documented in the NSVPA *2018 Air Quality Attainment Plan* for year 2020 results in a 0.01 percent increase in ROG emissions and a 0.01 percent increase in NO_X emissions compared with existing projections in the NSVPA. The NVSPA projected a population of 199,814 people in Shasta County in the year 2020.[9] The California Department of Finance reported a population total for Shasta County of 178,045 as of January 1, 2020.[10] As such, the proposed project is well within the growth projections of the NSVPA with regard to meeting its attainment goals.

It is the intent of the NSVPA *2018 Air Quality Attainment Plan* to achieve ozone attainment status, and while O_3 precursor emissions are projected to increase as a result of project development, this increase is minimal to the point of being insubstantial, as such development would represent a 0.01 percent increase

[8] SVBAPCC (Sacramento Valley Basinwide Air Pollution Control Council). 2018. *Northern Sacramento Valley Planning Area 2018 Triennial Air Quality Attainment Plan*.
[9] Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Plan (page 3). https://www.fraqmd.org/files/cc5597e19/2015+Triennial+AQAP.pdf Accessed October 22, 2020.
[10] California Department of Finance, E-1 City, Counties, and State Population Estimates; http://www.dof.ca.gov/forecasting/demographics/estimates/e-1/ Accessed October 22, 2020.

in ROG emissions and a 0.01 percent increase in NO_X emissions compared with existing projections. Therefore, the increase of O_3 precursor emissions would not have a statistically substantial effect on the emissions projections of the NSVPA *2018 Air Quality Attainment Plan*. Thus, the proposed project would not conflict with or obstruct implementation of the NSVPA *2018 Air Quality Attainment Plan*, and no impact would occur.

The NSVPA *2018 Air Quality Attainment Plan* identifies district rules and programs applicable to new development, including SCAQMD rules regarding wood stoves and fireplaces, architectural coatings, and fugitive dust during construction. Rules 3:16 (Fugitive, Indirect, or Non-Traditional Sources), 3:23 (Fireplaces and Solid Fuel Heating Device Usage), and 3:31 (Architectural Coatings) are described in subsection 5.3.2, Regulatory Setting, under Local-SCAQMD. Project-related development will be subject to all applicable SCAQMD rules.

Mitigation Measures: No mitigation measures are required.

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

IMPACT 5.3-2	***Project implementation could potentially result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under applicable state or federal ambient air quality standards.***

Significance: Less Than Significant With Mitigation Incorporated.

Impact Analysis: The project involves the construction and operation of 166 single-family homes. In addition, based on historical County trends it is assumed that approximately 9 percent of the lots would construct an accessory or secondary unit on their property. Therefore, air quality data for this project has been modeled to include 166 homes (approximately 3,550 square feet each) and 15 accessory dwellings with a maximum size of 1,200 square feet each. Activities associated with implementation of the proposed project would generate additional construction and operational emissions which would adversely affect regional air quality.

CONSTRUCTION EMISSIONS

Construction associated with the project would generate short-term emissions of criteria air pollutants. The proposed project would be constructed in phases; therefore, construction-generated emissions were quantified using a phase-by-phase analysis. Overall construction activities would 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, and the paving of approximately 17.2 acres of roadways. Equipment used for construction would vary day-to-day depending on the activity, but would include 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. These quantified emission projections were then compared with the applicable SCAQMD significance thresholds for each phase. Construction-generated emissions associated with the proposed project could potentially exceed the applicable thresholds of significance. Predicted maximum daily

construction-generated emissions for the proposed project are summarized in Table 5.3-6, CONSTRUCTION-RELATED EMISSIONS.

Table 5.3-6
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)
Phase I (46 units + 4 secondary units)					
Unmitigated Emissions	22.78	59.66	20.49	12.01	41.75
Mitigated Emissions	19.98	28.73	18.34	10.05	45.42
Phase II (19 units +2 secondary units)					
Unmitigated Emissions	13.34	33.148	19.91	11.47	36.62
Mitigated Emissions	11.25	24.19	18.34	10.05	40.87
Phase III (24 units +2 secondary units)					
Unmitigated Emissions	12.46	35.49	19.52	11.12	35.97
Mitigated Emissions	10.75	23.77	18.34	10.05	40.36
Phase IV (20 units +2 secondary units)					
Unmitigated Emissions	13.41	25.27	19.38	10.99	36.14
Mitigated Emissions	11.88	24.27	18.34	10.05	40.67
Phase V (43 units + 4 secondary units)					
Unmitigated Emissions	19.61	31.22	19.38	10.99	35.63
Mitigated Emissions	18.08	24.10	18.34	10.05	40.16
Phase VI (14 units + 1 secondary unit)					
Unmitigated Emissions	8.81	13.69	18.73	10.42	18.22
Mitigated Emissions	7.68	13.95	18.34	10.05	23.42
Significant Impact Thresholds					
Threshold A	**25**	**25**	**80**	**None**	**None**
Threshold B	**137**	**137**	**137**	**None**	**None**
Exceed Level A Threshold?	No	Yes	No	N/A	N/A
Exceed Level B Threshold?	No	No	No	N/A	N/A

Notes:
1. Emissions calculated using CalEEMod version 2013.2.2.
Refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA, for daily emission model outputs. Construction emissions also account for the construction of roadways for each phase.

Based on the modeling conducted, short-term daily emissions associated with the construction of the proposed project would not exceed the Level B significance threshold; however, the Level A significance threshold would be surpassed for NO_X emissions. The SCAQMD recommends that projects apply Standard Mitigation Measures (SMM) and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds Level A thresholds. As a result, implementation of **MM 5.3-1** that requires diesel-fueled construction equipment to have CARB certified Tier 4 or better engines to reduce NO_X emissions would be required throughout the duration of project construction activities. Additionally, **MM 5.3-1** also includes various dust control measures to reduce fugitive PM_{10} and $PM_{2.5}$, such as providing trackout devices, covering stockpiles, and limiting onsite vehicle speeds. Implementation of **MM 5.3-1** would substantially reduce impacts resulting from construction-generated emissions associated with project construction. Due to limitations in the modeling software, only the pollutant reductions resulting from the requirement of CARB certified Tier 4 or better engines and the fugitive dust measures are quantified.

Construction-generated emissions associated with the development of the proposed project will not exceed the Level B significance threshold. While the Level A significance threshold would be surpassed for NO_X emissions, feasible SMM and appropriate BAMM would be implemented per SCAQMD guidance as

required by **MM 5.3-1**. Therefore, impacts from construction-generated air pollutants would be *less than significant*.

Offsite Improvements

Several offsite intersection improvements have been identified for the proposed project (refer to **MM 5.16-1** and **MM 5.16-2** in Section 5.16, TRAFFIC AND CIRCULATION). These improvements have been included in the construction emissions modeling conducted for the proposed project noted above in Table 5.3-6. Similar to onsite construction activities associated with the proposed project, implementation of **MM 5.3-1** would be required during construction of improvements associated with **MM 5.16-1** and **MM 5.16-2**. Impacts in this regard would be *less than significant*.

OPERATIONAL EMISSIONS

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. Predicted maximum daily emissions are summarized in Table 5.3-7, LONG-TERM OPERATIONAL EMISSIONS. Note that emissions rates differ from summer to winter because different weather patterns affect pollutant mixing, dispersion, O_3 formation, and other factors.

Table 5.3-7
LONG-TERM 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					
Project Source	295.64	5.58	48.02	48.02	356.82
Energy Use	0.13	1.14	0.09	0.09	0.48
Mobile Source	3.24	25.68	14.17	3.86	32.83
Total	**299.02**	**32.41**	**62.29**	**51.98**	**390.14**
Winter Emissions					
Project Source	295.64	5.58	48.02	48.02	356.82
Energy Use	0.13	1.14	0.09	0.09	0.48
Mobile Source	2.46	26.22	14.17	3.86	29.07
Total	**298.24**	**32.95**	**62.29**	**51.98**	**386.38**
Significant Impact Thresholds					
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?	Yes	No	No	N/A	N/A

Notes:
1. Emissions calculated using CalEEMod version 2016.3.1.
2. Based on a total of 1,774 daily trips as shown in the traffic impact assessment prepared for the project.
Refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA, for daily emission model outputs.

As depicted in Table 5.3-7, emissions associated with operations of the proposed project would exceed Level A and Level B significance thresholds for ROG and Level A for NO_X. Therefore, mitigation would be required. **Mitigation Measure MM 5.3-2** prohibits the installation of wood burning fireplaces (natural gas fireplaces are acceptable). Additionally, **MM 5.3-3** requires energy efficient lighting, energy efficient and automated air conditioning controls, and exterior electrical outlets. Implementation of **MM 5.3-2** would

substantially reduce impacts resulting from long-term operational emissions associated with the project as shown in Table 5.3-8, MITIGATED LONG-TERM EMISSIONS. Due to limitations in the modeling software with regard to quantifying some energy efficient appliances, only the pollutant reductions resulting from the prohibition of wood-burning hearths are quantified.

Table 5.3-8
MITIGATED LONG-TERM 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	14.79	2.87	0.30	0.30	16.04
Energy Use	0.12	1.08	0.08	0.08	0.45
Mobile Source	3.24	25.68	14.17	3.86	32.83
Total	**18.16**	**29.63**	**14.56**	**4.25**	**49.33**
Winter Emissions					
Area Source	14.79	2.87	0.28	0.28	16.04
Energy Use	0.12	1.08	0.08	0.08	0.45
Mobile Source	2.46	26.22	14.17	3.86	29.07
Total	**17.38**	**30.17**	**14.56**	**4.25**	**45.57**
Significant Impact Thresholds					
Threshold A	**25**	**25**	**80**	**None**	**None**
Threshold B	**137**	**137**	**137**	**None**	**None**
Exceed Level A Threshold?	No	Yes	No	N/A	N/A
Exceed Level B Threshold?	No	No	No	N/A	N/A

Notes:
1. Emissions calculated using CalEEMod version 2016.3.1.
2. Mitigation measures include the use of natural gas fireplaces.
Refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA, for daily emission model outputs.

As previously stated, unmitigated emissions associated with operations of the proposed project would exceed Level A and Level B significance thresholds for ROG, and Level A thresholds for NO_X. The SCAQMD recommends that projects apply SMM and appropriate BAMM when a project exceeds Level A thresholds. Projects that cannot mitigate emissions to levels below the Level B thresholds are considered significant.

Table 5.3-8, above, shows the reduction in emissions with the inclusion of **MM 5.3-2**. As shown, implementation of **MM 5.3-2** would reduce ROG levels to below the Level B significance threshold. In order to address NO_X emissions, SMM would be implemented per SCAQMD guidance as required by **MM 5.3-3**. As shown in Table 5.3-8, NO_x emissions would be reduced to below the Level B threshold. Therefore, with the implementation of **MM 5.3-2** and **MM 5.3-3**, impacts from NO_x emissions would be reduced to below the Level B Threshold and potential impacts on air quality would be reduced to a *less than significant* level.

Combined Construction and Operational Emissions

As noted above, the project would be constructed in six phases. Therefore, the potential exists for multiple phases could be operational while a future phase is being constructed. Table 5.3-9, COMBINED OPERATIONAL AND CONSTRUCTION EMISSIONS (MITIGATED), shows that under the total operational emissions of all six phases when combined with the emissions generated during each construction phase would not exceed Level B threshold with the implementation of **MM 5.3-1**, **MM 5.3-2**, and **MM 5.3-3**.

increase impacts beyond what is identified above. The potential overlap of construction and operational emissions would not change the magnitude of project emissions. It should be noted that Table 5.3-9 conservatively shows the total project operational emissions and not just the operational emissions of the preceding phases. Therefore, potential overlapping construction and operational emissions would be lower than when calculated separately. Impacts would be less than significant in this regard.

Table 5.3-9
COMBINED OPERATIONAL AND CONSTRUCTION EMISSIONS (MITIGATED)

Construction and Operation	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 I					
Mitigated Construction Emissions	19.98	28.73	18.34	10.05	45.42
Mitigated Operation Emissions (Phases I-VI)	18.16	30.17	14.56	4.24	49.33
Total Emissions	**38.14**	**58.9**	**32.9**	**14.29**	**94.75**
Phase II					
Mitigated Construction Emissions	11.25	24.19	18.34	10.05	40.87
Mitigated Operation Emissions (Phases I-VI)	18.16	30.17	14.56	4.24	49.33
Total Emissions	**29.41**	**54.36**	**32.9**	**14.29**	**90.2**
Phase III					
Mitigated Construction Emissions	10.75	23.77	18.34	10.05	40.36
Mitigated Operation Emissions (Phases I-VI)	18.16	30.17	14.56	4.24	49.33
Total Emissions	**28.91**	**53.94**	**32.9**	**14.29**	**89.69**
Phase IV					
Mitigated Construction Emissions	11.88	24.27	18.34	10.05	40.67
Mitigated Operation Emissions (Phases I-VI)	18.16	30.17	14.56	4.24	49.33
Total Emissions	**30.04**	**54.44**	**32.9**	**14.29**	**90**
Phase V					
Mitigated Construction Emissions	18.08	24.10	18.34	10.05	40.16
Mitigated Operation Emissions (Phases I-VI)	18.16	30.17	14.56	4.24	49.33
Total Emissions	**36.24**	**54.27**	**32.9**	**14.29**	**89.49**
Phase VI					
Mitigated Construction Emissions	7.68	13.95	18.34	10.05	23.42
Mitigated Operation Emissions (Phases I-VI)	18.16	30.17	14.56	4.24	49.33
Total Emissions	**25.84**	**44.12**	**32.9**	**14.29**	**72.75**
Significant Impact Thresholds					
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 2013.2.2.
Refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA, for daily emission model outputs. Construction emissions also account for the construction of roadways for each phase.

Criteria Pollutant Health Impacts

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 ambient air quality standard, 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 the Regulatory Setting section of this chapter, 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 previously discussed, Project emissions would be less than significant and would not exceed SCAQMD Level B thresholds (refer to Table 5.3-6 through Table 5.3-9). 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 combined with construction emissions would be less than significant.

Mitigation Measures:

MM 5.3-1: Prior to issuance of a grading permit, the project applicant shall submit a grading plan for review and approval by the Shasta County Building Department. The following specifications shall be included to reduce short-term air quality impacts attributable to the proposed project:

- 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 Certified 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]
- 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 County of Shasta.
- 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 quality 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 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.

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

[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.

- 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.
- 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.

MM 5.3-2: Prior to the issuance of individual building permits, the Shasta County Building Department shall confirm that all construction documents and specifications stipulate that the installation of wood-burning fireplaces is prohibited. Natural gas fireplaces are acceptable.

MM 5.3-3: Prior to the issuance of individual building permits, the Shasta County Building Department shall confirm that all project plans and specifications include the following design features:

- The project shall provide for the use of energy-efficient lighting (includes controls) and process systems such as water heaters, furnaces, and boiler units.
- The project shall utilize energy-efficient and automated controls for air conditioning.
- Residential structures shall include exterior electric outlets in the front and rear.

Level of Significance After Mitigation: Impacts would be *less than significant* impact with mitigation incorporated.

IMPACT 5.3-3	***Project implementation would not expose sensitive receptors to substantial pollutant concentrations.***

Significance: Less Than Significant With Mitigation Incorporated.

Impact Analysis: The primary pollutants of concern to human health generated by the proposed project are criteria pollutants and TACs.

Regional Criteria Pollutants

The California Supreme Court's decision in Sierra Club v. County of Fresno (6 Cal. 5th 502) (Friant Ranch Decision) reviewed the long-term, regional air quality analysis contained in the EIR for the proposed Community Plan Update and Friant Ranch Specific Plan (Friant Ranch Project). The Friant Ranch Project is a 942-acre master-plan development in unincorporated Fresno County within the San Joaquin Valley Air Basin, an air basin currently in nonattainment under the NAAQS and CAAQS for ozone and PM2.5. The California Supreme Court found that the Friant Ranch Project EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The Court's decision clarifies that environmental documents must attempt to connect a project's regional air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

Models and tools have been developed to correlate regional criteria pollutant emissions to potential community health impacts. Appendix RDEIR-A-2, *Technical Modeling Considerations For Criteria Pollutants And Human Health Effects,* summarizes many of these tools, identifies the analyzed pollutants, describes their intended application and resolution, and analyzes whether they could be used to reasonably correlate project-level emissions to specific health consequences. As described in Appendix RDEIR-A-2, while there are models capable of quantifying ozone and secondary PM formation and associated health effects, these tools were developed to support regional planning and policy analysis and have limited sensitivity to small changes in criteria pollutant concentrations induced by individual projects. Therefore, translating project-generated criteria pollutants to the locations where specific health effects could occur or the resultant number of additional days of nonattainment cannot be achieved with any degree of accuracy for relatively small projects (relative to the regional air basin).

The Sacramento Metropolitan Air District (SMAQMD) adopted updated CEQA Guideline to address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District in June 2020 (available online here: http://www.airquality.org/Residents/CEQA-Land-Use-Planning/CEQA-Guidance-Tools). Although this project is not in the Sac Metro Air District, the project is within the same North Sacramento Valley Air Basin as the SMAQMD and their adopted Guidance "provides insight on the health effects that may result from a Project emitting at the maximum thresholds of significance (TOS) levels in the SFNA [Sacramento Federal Ozone Non-Attainment Area] for oxides of nitrogen (NOX), volatile organic compounds (VOCs), and PM, in addition to levels of CO and oxides of sulfur (SOX) calculated proportional to NOX (as described in Section 4.1). This information can be used in environmental documents to provide a conservative estimate the health effects of the emissions of criteria pollutants at levels at or below the significance thresholds." SCAQMD has not published a similar guidance document. Notably, the project's emissions of criteria pollutants (shown below) are well below the maximum thresholds of significance used in the SMAQMD CEQA Guide[13]:

	Criteria Pollutants (Tons per Year)_			
	NOx	**ROG**	**PM_{10}**	**$PM_{2.5}$**
Thresholds Used in SMAQMD CEQA Guide	65	65	80	82
Annual Mitigation Project Emissions	59.8	35.54	29.12	8.5

[13] Sacramento Metropolitan Air Quality Management District, *Guide to Air Quality Assessment in Sacramento County (CEQA Guide),* Chapter 2l Appendix, http://www.airquality.org/Residents/CEQA-Land-Use-Planning/CEQA-Guidance-Tools Accessed November 6, 2020.

According to the SMAQMD, because this project has estimated emissions of well below the thresholds of significance used in the SMAQMD CEQA Guide, the project's health impacts from criteria pollutants would not be significant or substantial.

Local Criteria Pollutants

The proposed project could create a significant hazard to residents in the vicinity and other sensitive receptors through exposure to substantial pollutant concentrations such as ROG, NO_X and particulate matter and/or other toxic air contaminants during construction activities. Sensitive land uses are generally defined as locations where people reside or where the presence of air emissions could adversely affect the use of the land. Typical sensitive receptors include residents, schoolchildren, hospital patients, and the elderly. The project site is located within an area of large-lot single family homes. The nearest residential land uses would be those surrounding the project site on the western and southern boundaries. No schools, hospitals, or senior care homes exist in the immediate area.

Criteria Pollutants and Toxic Air Contaminants

Construction activities would involve the use of a variety of gasoline- or diesel-powered equipment that emits exhaust fumes. Residents in the vicinity would potentially be exposed to nuisance dust and heavy equipment emission diesel exhaust during construction. However, the duration of exposure would be short and exhaust from construction equipment dissipates rapidly. According to CARB, concentrations of mobile-source diesel particulate matter (DPM) emissions are typically reduced by 70 percent at a distance of approximately 500 feet.[14]

California Office of Environmental Health Hazard Assessment has not identified short-term health effects from DPM. Construction is temporary and would be transient throughout the site (i.e. move from location to location) and would not generate emissions in a fixed location for extended periods of time. Construction would be subject to and would comply with California regulations limiting the idling of heavy-duty construction equipment to no more than 5 minutes to further reduce nearby sensitive receptors' exposure to temporary and variable DPM emissions.

As discussed previously, project construction would not result in exceedances of SCAQMD standards. As shown in Table 5.3-6, **MM 5.3-1** would reduce ROG, NO_X, and PM_{10} emissions below the Level B significance thresholds. The temporary duration of construction activities coupled with implementation of **MM 5.3-1** would ensure sensitive receptors within the vicinity of the project site would not be exposed to substantial criteria pollutant emissions or toxic air contaminants (TAC) generated during construction. Therefore, with implementation of MM 5.3-1, potential impacts from TACs would be less than significant.

Carbon Monoxide Hotspots

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

[14] CARB (California Air Resources Board). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*.

operate at unacceptable levels of service during the peak commute hours.[15] 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 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) for the South Coast Air Quality Management District's *2003 Air Quality Management Plan* (2003 AQMP) can be used to assist in evaluating the potential for CO exceedances. 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.[16]

According to the *Supplemental Traffic Impact Analysis* (August 2017), and *Updated Technical Memorandum* (February 2019), the proposed project would generate 1,774 vehicle trips. 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. As a result, this impact would be considered *less than significant*.

Mitigation Measures: Implement **MM 5.3-1**.

Level of Significance After Mitigation: Impacts would be *less than significant* with mitigation incorporated.

[15] 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.
[16] SCAQMD (South Coast Air Quality Management District). 2003. *Final 2003 AQMP Appendix V – Modeling and Attainment Demonstrations*.

IMPACT 5.3-4	*Project implementation would not result in other emissions (such as those leading to odors) that would adversely affect 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. Implementation of the proposed project would involve individual septic tanks and a community wastewater treatment system. The individual septic tanks would include carbon filters to control odors. The wastewater treatment system would be designed to meet the reuse requirements for discharge of Title 22 (Disinfected Secondary Effluent). Title 22 reuse requires daily testing for coliform and also includes provisions for odor and nuisance control. Furthermore, the project would be required to comply with SCAQMD Rule 3:16 and *California Health & Safety Code* Section 41700, which prohibits the discharge of contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. Therefore, the project would not generate odors that would be noticeable at any of the surrounding sensitive receptors and impacts in this regard would be *less than significant*.

Mitigation Measures: No mitigation measures are required.

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

5.3.5 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

IMPACT 5.3-5	***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).***

Significance: Potentially Significant Impact.

Cumulative Setting: The cumulative setting for air quality includes the Shasta County in its entirety and the North Sacramento Valley Air Basin. The Shasta County portion of the NSVAB is designated as a nonattainment area for the state O_3 standard. 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.

Impact Analysis: The SCAQMD thresholds do not include separate significance thresholds for cumulative operational emissions. However, with respect to regional air pollution, the development of the project would result in population growth that is consistent with the County's General Plan projections. The Supplemental EIR (SEIR) prepared for the most recent comprehensive General Plan Update (1993) states as follows:

The SEIR identifies the following cumulative impacts which cannot be mitigated to less than a significant level by General Plan mitigation: land use, circulation, air quality and public services including sheriff and schools.

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 NO_X emissions, feasible SMM and appropriate BAMM would be implemented per SCAQMD guidance as required by **MM 5.3-1**. As a result, impacts from construction-generated air pollutants would be considered *less than significant*. As also discussed previously, implementation of **MM 5.3-2** would reduce ROG levels to below the Level B significance threshold, and in order to address NO_X emissions, feasible SMM would be implemented per SCAQMD guidance as required by **MM 5.3-3**. However, as long-term mitigated NOx emissions would exceed the SCAQMD's Level A significance threshold, and NO_x is a precursor pollutant for ozone (Shasta County is a nonattainment area for State ozone standards; refer to Table 5.3-4), the project's long-term operational NOx emissions are cumulatively considerable. Therefore, this impact would be cumulatively *significant*.

Mitigation Measures: Implement **MM 5.3-1**, **MM 5.3-2,** and **MM 5.3-3**.

Level of Significance After Mitigation: As discussed above and shown in Tables 5.3-8 and 5.3-9, the project's construction and operational emissions would be below Level B significance thresholds with implementation of **MM 5.3-1**, **MM 5.3-2,** and **MM 5.3-3**. Despite implementation of these mitigation measures identified for this proposed project, the project's long-term NO_x emissions would be cumulatively considerable, and would result in *significant and unavoidable* cumulative air quality impacts.

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