5 AIR QUALITY

INTRODUCTION

This chapter describes existing local and regional air quality conditions; summarizes applicable air quality regulations at the federal, state, and local levels; and analyzes potential short-term and long-term air quality impacts that could result from implementation of the proposed project.

In response to the Notice of Preparation, the Sacramento Metropolitan Air Quality Management District (SMAQMD) recommended that the analysis of impacts to air quality consider the SMAQMD's CEQA Guide to Air Quality Assessment in Sacramento County (SMAQMD 2021).

ENVIRONMENTAL SETTING

Ambient concentrations of air pollutants are determined by the amount of emissions released by the air pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

LOCATION, CLIMATE, AND ATMOSPHERIC CONDITIONS

The project site is in the Sacramento Valley Air Basin (SVAB), which is characterized by cool winters and hot, dry summers tempered by occasional westerly breezes from the Sacramento–San Joaquin River Delta (Delta). The region has a Mediterranean climate, characterized by hot, dry summers and cool, rainy winters.

In general, the SVAB is relatively flat and bounded by the north Coast Ranges to the west and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Delta from the San Francisco Bay Area. The inland location and surrounding mountains typically prevent the area from experiencing much of the ocean breeze that moderates the temperatures in coastal regions. The mountains surrounding the Sacramento Valley create a barrier to air flow, which can trap in air pollutants, particularly in the autumn and early winter when large pressure cells lie over the Sacramento Valley and temperatures are low. The lack of surface wind during these periods and reduced vertical flow caused by less surface heating, reduces the influx of outside air and allows air pollutants generated within the SVAB to become concentrated in a stable volume of air. Ground concentrations are the highest when these conditions are combined with smoke from agricultural burning or forest fires or when temperature inversions trap cool air, fog, and

pollutants near the ground. Alternatively, winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility.

Characteristic of the winter months in the SVAB are periods of dense and persistent low-level fog, which are most prevalent between storms. This precipitation and fog also tend to reduce or limit some pollutant concentrations. However, between winter storms, high pressure and light winds contribute to low-level temperature inversions and stable atmospheric conditions, resulting in the concentration of air pollutants.

May through October is ozone season in the SVAB and is characterized by poor air movement in the mornings and the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, with the longer daylight hours, a larger amount of sunlight is available to fuel photochemical reactions between volatile organic compounds (VOC) and nitrogen oxide (NO_X), which in turn result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB. However, during approximately half of the time from July to September, a phenomenon known as the Schultz Eddy prevents this from occurring. The Schultz Eddy phenomenon causes winds on the west side of the SVAB to shift to a northerly wind, blowing air pollutants southward back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the air basin and can contribute to violations of ambient air quality standards.

Criteria Air Pollutants

There are many pollutants present in the atmosphere, although most are not a significant public health concern in the project region. A brief description of key criteria air pollutants in the SVAB and their health effects is provided below. Criteria air pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) less than 10 micrometers in diameter (PM_{10}), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and lead. However, for the purposes of this analysis, criteria air pollutants of primary concern due to the regional nonattainment status (refer to Table AQ-1 further below) include ozone (and ozone precursors) and PM. Criteria air pollutants, their sources, and potential health effects from exposure are summarized below.

Ozone. Ozone is the most common component of smog and is the principal pollutant that causes adverse health effects. Ozone is toxic and colorless and has a pungent odor. In high concentrations, ozone and other photochemical oxidants are directly detrimental to humans by causing respiratory irritation and possible alterations in the functioning of the lungs. Ozone and other oxidants can also enter the leaves of plants and reduce photosynthesis, which is the process that plants use to convert sunlight to energy to live and grow.

Ozone is not emitted directly into the air but is formed through a series of reactions involving reactive organic gases (ROG) and NO_X in the presence of sunlight. These chemicals are considered to be precursors of ozone, as their reaction leads to its formation. ROG emissions result primarily from incomplete combustion and the

evaporation of chemical solvents and fuels. NO_X includes various combinations of nitrogen and oxygen, including nitric oxide, NO_2, and others, typically resulting from the combustion of fuels.

Emissions of both ROG and NO_X are considered critical to ozone formation; therefore, either ROG or NO_X can limit the rate of ozone production. When the production rate of NO_X is lower, indicating that NO_X is scarce, the rate of ozone production is NO_X-limited. Under these circumstances, ozone levels could be most effectively reduced by lowering current and future NO_X emissions (from fuel combustion), rather than by lowering ROG emissions. Rural areas tend to be NO_X-limited, while areas with dense urban populations tend to be ROG-limited. The project site is located in the central region of the Sacramento Regional Nonattainment Zone, which typically exhibits NO_X-limited chemistry (SMAQMD 2023).

Ozone concentrations reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air, coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. 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 affects large areas.

Individuals exercising outdoors, children, and people with lung disease, such as asthma and chronic pulmonary lung disease, are the most susceptible subgroups for ozone effects. Short-term ozone exposure (lasting for a few hours) can result in changes in breathing patterns, reductions in breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes. A correlation has also been reported between elevated ambient ozone levels and increases in daily hospital admission rates and mortality (EPA 2023a). An increased risk of asthma has been found in children who participate in multiple sports and live within communities with high ozone levels.

Emissions of the ozone precursors, ROG and NO_X, have decreased in the past several years. According to the most recently published edition of California Air Resources Board (CARB) California Almanac of Emissions and Air Quality, NO_X, and ROG emissions levels in the Sacramento metropolitan area are projected to continue to decrease through 2035, largely because of more stringent motor vehicle standards and cleaner burning fuels, as well as rules for controlling ROG emissions from industrial coating and solvent operations (CARB 2013).

Carbon Monoxide. CO is a colorless and odorless gas that is primarily produced by the incomplete burning of carbon in fuels such as natural gas, gasoline, and wood, and is emitted by a wide variety of combustion sources, including on-road and non-road mobile sources, wood-burning stoves, incinerators, industrial sources, and wildfires. On-road and non-road mobile sources account for approximately 35 percent and 26 percent, respectively, of all CO emissions nationwide (EPA 2023b). Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying

slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called "hot spots," which can be hazardous to human receptors adjacent to the intersections.

Adverse health effects associated with exposure to high CO concentrations, typically only attainable indoors or within similarly enclosed spaces, include dizziness, headaches, and fatigue. CO exposure is especially harmful to unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease (CARB 2024a).

Nitrogen Dioxide. NO_2 is one of a group of highly reactive gases known as oxides of nitrogen, or NO_X. NO_2 is formed when ozone reacts with nitric oxide (i.e., NO) in the atmosphere and is listed as a criteria pollutant because NO_2 is more toxic than nitric oxide. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. The combined emissions of nitric oxide and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a geographical area may not be representative of local NO_X emission sources. NO_X also reacts with water, oxygen, and other chemicals to form nitric acids, contributing to the formation of acid rain.

Inhalation is the most common route of exposure to NO_2. Breathing air with a high concentration of NO_2 can lead to respiratory illness. Short-term exposure can aggravate respiratory diseases, particularly asthma, resulting in respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma (EPA 2023c).

Sulfur Dioxide. SO_2 is one component of the larger group of gaseous oxides of sulfur (SO_X). SO_2 is used as the indicator for the larger group of SO_X, as it is the component of greatest concern and found in the atmosphere at much higher concentrations than other gaseous SO_X. SO_2 is typically produced by such stationary sources as coal and oil combustion facilities, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, a direct irritant. Concentration rather than duration of exposure is an important determinant of respiratory effects. Children, the elderly, and those who suffer from asthma are particularly sensitive to effects of SO_2 (EPA 2023d).

SO_2 also reacts with water, oxygen, and other chemicals to form sulfuric acids, contributing to the formation of acid rain. SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other SO_X, which can react with other compounds in the atmosphere to form small particles, contributing to particulate matter pollution, which can have health effects of its own.

Particulate Matter. PM refers to a complex mixture of small solid matter and fine droplets (aerosols) made up of several components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The major area-wide sources of $PM_{2.5}$ and PM_{10} are fugitive dust, especially from roadways, agricultural operations, and construction and demolition. Other sources of PM_{10} include crushing or grinding operations. $PM_{2.5}$ sources also include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. Exhaust emissions from mobile sources contribute only a very small portion of directly emitted $PM_{2.5}$ and PM_{10} emissions. However, they are a major source of ROG and NO_X, which undergo reactions in the atmosphere to form PM, known as secondary particles. These secondary particles make up the majority of PM pollution.

The size of PM is directly linked to its potential for causing health problems. U.S. Environmental Protection Agency (EPA) is concerned about particles that are 10 micrometers in diameter or smaller, because these particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects, even death. The adverse health effects of PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances adsorbed onto fine PM (referred to as the “piggybacking effect”), or with fine dust particles of silica or asbestos. Effects from short- and long-term exposure to elevated concentrations of PM_{10} include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, a weakened immune system, and cancer (World Health Organization 2021).

$PM_{2.5}$ poses an increased health risk because these very small particles can be inhaled deep in the lungs and may contain substances that are particularly harmful to human health. Direct emissions of $PM_{2.5}$ in the Sacramento metropolitan area decreased between 2000 and 2010 but are projected to increase very slightly between 2010 and 2035. Emissions of diesel particulate matter (DPM) decreased from 2000 through 2010 because of reduced exhaust emissions from diesel mobile sources and are anticipated to continue to decline through 2035 (CARB 2013).

Lead. Lead is a highly toxic metal that may cause a range of human health effects. Lead is found naturally in the environment and is used in manufactured products. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. Soon after its inception, EPA began working to reduce lead emissions, issuing the first reduction standards in 1973. Lead emissions decreased substantially after the near elimination of leaded gasoline use. Metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose “hot spot” problems in some areas. As a result, CARB has identified lead as a Toxic Air Contaminant (TAC).

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and

function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotients. In adults, increased lead levels are associated with cardiovascular effects, increased blood pressure and incidence of hypertension, decreased kidney function, and reproductive problems (EPA 2023e). Lead poisoning can cause abdominal pain, anemia, lethargy, seizures, and death (US Department of Health and Human Services 2020).

Existing Air Quality Conditions

Concentrations of emissions from criteria air pollutants are used to indicate the quality of the ambient air. Ambient air pollutant concentration monitoring data for the latest three years for which data is available (2020 through 2022) for the criteria pollutants for which the region is in nonattainment are provided in Table AQ-1. The data presented for ozone and $PM_{2.5}$ is based on monitoring results from the CARB monitoring site nearest the project site at Sloughhouse, approximately 5.9 miles southwest of the project site. The data presented for NO_2 is based on monitoring results from the CARB monitoring site at Sacramento-Del Paso Manor, located approximately 12 miles west of the project site. The data presented for PM_{10} is based on monitoring results from the CARB monitoring site at Sacramento-Branch Center Road #2, located approximately 10.6 miles west of the project site. The regional attainment status for each pollutant is described in Table AQ-2 below.

Table AQ-1: Local Air Quality Monitoring Summary

Pollutant and Averaging Period	Item	2020	2021	2022
Ozone 1 Hour	Max 1 Hour (ppm)	0.092	0.104	0.098
Ozone 1 Hour	Days > State Standard (0.09 ppm)	0	2	1
Ozone 8 Hour	Max 8 Hour (ppm)	0.077	0.097	0.085
Ozone 8 Hour	Days > State Standard (0.070 ppm)	6	13	5
Ozone 8 Hour	Days > National Standard (0.070 ppm)	5	13	5
NO_2 Annual	Annual Average (ppm)	0.005	-	0.005
NO_2 1 Hour	Max 1 Hour (ppm)	0.046	0.024	0.034
NO_2 1 Hour	Days > State Standard (0.18 ppm)	0	0	0
PM_{10} Annual	Annual Average (µg/m^3)	-	24.8	22.3
PM_{10} 24 hour	Max 24 Hour (µg/m^3)	203.0	58.0	54.0
PM_{10} 24 hour	Days > State Standard (50 µg/m^3)	10	4	1
PM_{10} 24 hour	Days > National Standard (150 µg/m^3)	1	0	0
$PM_{2.5}$ Annual	Annual Average (µg/m^3)	11.8	-	-
$PM_{2.5}$ 24 hour	Max 24 Hour (µg/m^3)	126	190.4	26.1
$PM_{2.5}$ 24 hour	Days > National Standard (35 µg/m^3)	20	5	0

Source: CARB 2024b

Notes:

- = insufficient data; µg/m^3 = micrograms per cubic meter; PM_{10} = particulate matter with aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; ppm = parts per million.

The 2020 24-hour PM_{10} maximum concentration appears to have been affected by wildfire events (EPA 2023f).

Toxic Air Contaminants

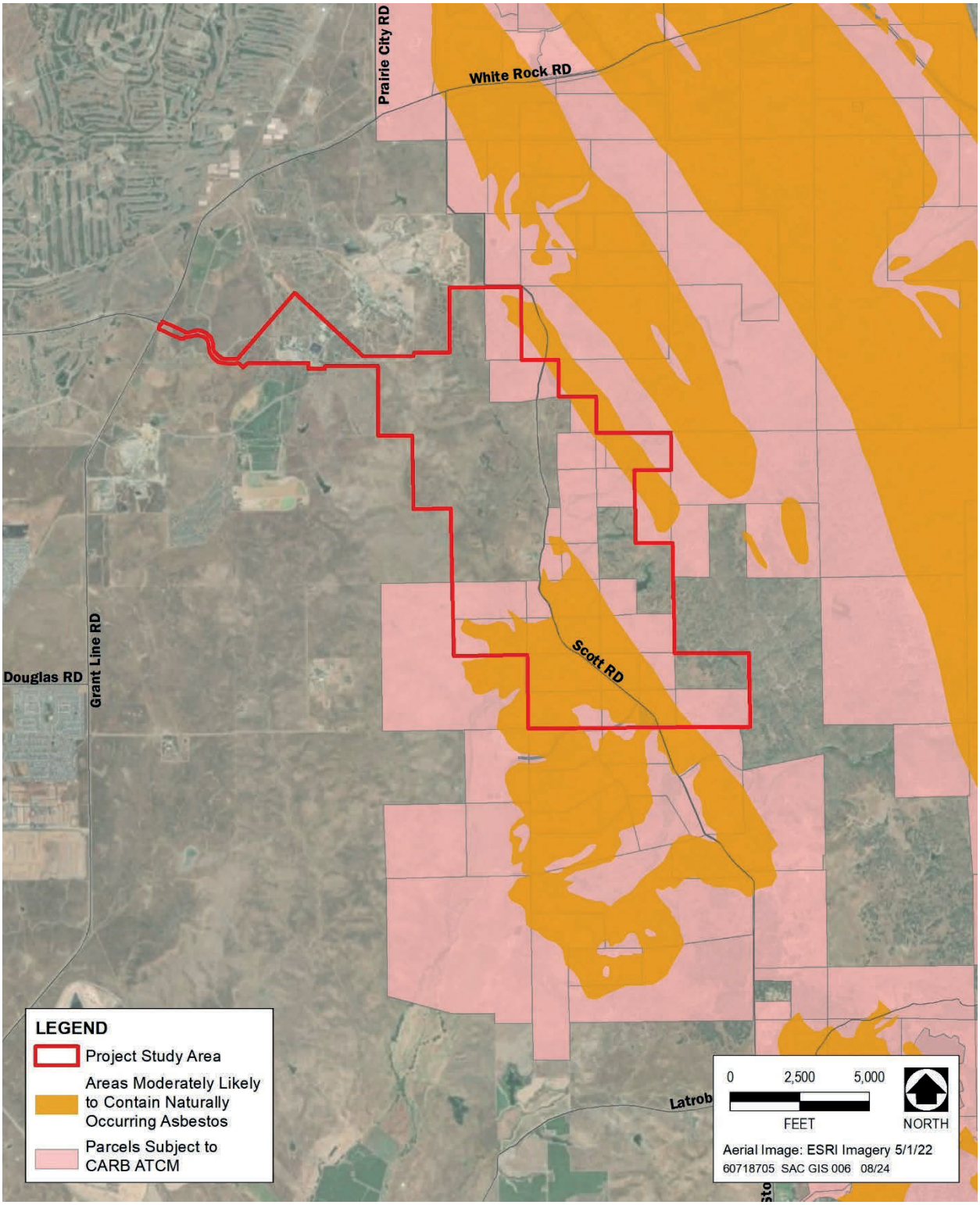
TACs are a set of airborne pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term 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.

Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Stationary sources of hazardous air pollutants (HAPs) include gasoline stations, dry cleaners, and diesel backup generators, which are subject to permit requirements. On-road motor vehicles and off-road sources, such as construction equipment and trains, are also common sources of TACs. According to the *California Almanac of Emissions and Air Quality* (CARB 2013), most of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (i.e., DPM). Other TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

DPM differs from other TACs because it is not a single substance, but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, type of lubricating oil, and presence or absence of an emission control system. Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists. However, emissions of DPM are forecasted to decline; it is estimated that emissions of DPM in 2035 will be less than half those in 2010, further reducing statewide cancer risk and non-cancer health effects (CARB 2013).

Another concern related to air quality is naturally occurring asbestos (NOA). Asbestos is a term used for several types of naturally occurring fibrous minerals found in many parts of California. When rock containing asbestos is broken or crushed, such as through construction-related ground disturbance or rock quarrying activities where NOA is present, asbestos fibers may be released and become airborne. Exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity), and asbestosis (a non-cancerous lung disease which causes scarring of the lungs). Because asbestos is a known carcinogen, NOA is considered a TAC. NOA is typically associated with fault zones, and areas containing serpentinite or contacts between serpentinite and other types of rocks. According to the California Department of Conservation *Special Report 192: Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California*, the project site is located within areas categorized as moderately likely and least likely to contain NOA (California Department of Conservation 2006). This data is provided in Plate AQ-1, below.

Plate AQ-1: Relative Likelihood of Naturally Occurring Asbestos in the Project Vicinity



Source: SMAQMD 2017

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, because of the types of population groups or activities involved. Children, pregnant women, the elderly, those with existing health conditions, and athletes or others who engage in frequent exercise are especially vulnerable to the effects of air pollution. Accordingly, land uses that are typically considered sensitive receptors include schools, daycare centers, parks and playgrounds, and medical facilities.

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to the pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution, even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time.

The project site is generally surrounded by agricultural and recreational land uses. Sensitive land uses in the project vicinity include single-family residences north of the project site along the entrance to the Prairie City State Vehicular Recreation Area and west of the project site along Pleasant Hill Lane. The nearest sensitive receptor to the proposed project facilities is a residence along the entrance to the Prairie City State Vehicular Recreation Area approximately 3,200 feet north of the proposed project's northwestern boundary.

Odors

The ability to detect odors varies considerably among the population and is subjective. Offensive odors can affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, the VOCs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects, such as stress.

Several examples of common land uses that generate substantial odors are wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants. In addition, odors can be caused by agricultural activities, such as dairy operations; horse, cattle, or sheep (livestock) grazing; fertilizer use; and aerial crop spraying.

REGULATORY SETTING

The project site is within in the SVAB, in the eastern portion of the SMAQMD's jurisdictional boundary. The EPA, CARB, and SMAQMD are responsible for regulating air quality in the vicinity of the project site. Each agency develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, in general, both state and local regulations may be more stringent. The regulatory framework related to criteria air pollutants, TACs, and other types of emissions is summarized below.

FEDERAL

CRITERIA AIR POLLUTANTS

The primary legislation that governs federal air quality regulations is the Clean Air Act (CAA), enacted in 1970 and amended by Congress most recently in 1990. The CAA delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies.

Under the CAA, EPA has established the national ambient air quality standards (NAAQS) for six criteria air pollutants discussed previously: ozone, CO, NO_2, SO_2, particulate matter (PM_{10} and $PM_{2.5}$), and lead. The purpose of the NAAQS is two-tiered: primarily to protect public health, and secondarily to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property). The current primary and secondary NAAQS are shown in Table AQ-2. These health-based pollutant standards are reviewed with a legally prescribed frequency and are revised, as warranted, based on new data on health and welfare effects. Each standard is based on a specific averaging time over which the concentration is measured. Different averaging times are based on protection from short-term, high-dosage effects or longer term, low-dosage effects.

The CAA requires EPA to determine if areas of the country meet the NAAQS for each criteria air pollutant. Areas are designated according to the following basic designation categories:

- **Attainment:** This designation signifies that pollutant concentrations in the area do not exceed the established standard. In most cases, a maintenance plan is required for a region after it has attained an air quality standard and is designated as an attainment or maintenance area after previously being designated as nonattainment. Maintenance plans are designed to ensure continued compliance with the standard.
- **Nonattainment:** This designation indicates that a pollutant concentration has exceeded the established standard. Nonattainment may differ in severity. To identify the severity of the problem and the extent of planning and actions required to meet the standard, nonattainment areas are assigned a classification that is commensurate with the severity of their air quality problem (e.g., moderate, serious, severe, extreme).

- **Unclassifiable:** This designation indicates that insufficient data exist to determine attainment or nonattainment. For regulatory purposes, an unclassified area is generally treated the same as an attainment area.

As shown in Table AQ-3, the SMAQMD meets the NAAQS for all criteria air pollutants except ozone and $PM_{2.5}$. The CAA requires each state to prepare an air quality control plan, referred to as a state implementation plan (SIP) to demonstrate how attainment standards will be achieved. The SIP is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analyses. The SIP is not a single document, but a compilation of new and previously submitted attainment plans, emissions reduction programs, air district rules, state regulations, and federal controls. The SIP must include pollution control measures that demonstrate how the standards will be met by the dates specified in CAA.

Toxic Air Contaminants

Air quality regulations also focus on HAPs, referred to at the state level as TACs. Stationary sources of HAPs include gasoline stations, dry cleaners, and diesel backup generators, all of which are subject to permit requirements and permit conditions designed to avoid any substantial adverse environmental impact. On-road motor vehicles and off-road sources, such as construction equipment and trains, are also common sources of HAPs. Public exposure to HAPs can result from emissions from normal operations, as well as accidental releases.

HAPs can be separated into carcinogens (cancer-causing) and non-carcinogens, based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur. Non-carcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. EPA regulates HAPs through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions.

The CAA requires EPA to identify and set national emissions standards for HAPs to protect public health and welfare. Emissions standards are set for what are called “major sources” and “area sources.” Major sources are defined as stationary sources with potential to emit more than 10 tons per year of any HAP or more than 25 tons per year of any combination of HAPs; all other sources are considered area sources. There are two types of emissions standards: those that require application of MACT and BACT, and those that are health-risk based and deemed necessary to address the risks that remain after implementation of MACT or BACT. For area sources, the MACT or BACT standards may be different because of differences in generally available control technology. The CAA also requires EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions of, at a minimum, benzene and formaldehyde. Performance criteria are established to limit mobile-source emissions of toxics.

Table AQ-2: National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[1]	NAAQS[2,3] Primary[4]	NAAQS[2,3] Secondary[5]
Ozone [6,7]	1-hour	0.09 ppm (180 µg/m^3)	NA	NA
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Same as Primary
PM_{10}	24-hour	50 µg/m^3	150 µg/m^3	Same as Primary
	Annual Arithmetic Mean	20 µg/m^3	NA	NA
$PM_{2.5}$ [8]	24-hour	NA	35 µg/m^3	Same as Primary
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	15.0 µg/m^3
CO	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	NA
	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	NA
NO_2	1-hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	NA
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
SO_2	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	NA
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	NA
	Annual Arithmetic Mean	NA	0.030 ppm (80 µg/m^3)	NA
Lead [9]	30-day Average	1.5 µg/m^3	NA	NA
	Calendar quarter	NA	1.5 µg/m^3	Same as Primary
	Rolling 3- month Average	NA	0.15 µg/m^3	
Visibility-Reducing Particles	8-hour	See Note 10	NA	NA
Sulfates	24-hour	25 µg/m^3	NA	NA
H_2S	1-hour	0.03 ppm (42 µg/m^3)	NA	NA
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	NA	NA

Source: CARB 2016

Key:
µg/m^3 = micrograms per cubic meter; CO = carbon monoxide; EPA = U.S. Environmental Protection Agency; H_2S = hydrogen sulfide; mg/m^3 = milligrams per cubic meter; NA = not applicable; NO_2 = nitrogen dioxide; O_3 = ozone; PM_{10} = particulate matter 10 microns in diameter or less; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide.

1 California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, particulate matter – (PM_{10}, $PM_{2.5}$, and visibility reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded.

2 National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

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

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

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

6 The national 1-hour ozone standard was revoked by the EPA on June 15, 2005.

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

8 In December 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 to 12.0 micrograms per cubic meter (µg/m^3). The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

9 The national standard for lead was revised in October 2008 to a rolling 3-month average.

10 In 1989, CARB converted the statewide 10-mile visibility standard to an instrumental evaluation, which is “extinction of 0.23 per kilometer”. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Table AQ-3: Attainment Status for Federal and State Ambient Air Quality Standards

Pollutant	Federal Standard	State Standard
Ozone	Nonattainment	Nonattainment
Particulate Matter—10 Micrometers or Less	Attainment	Nonattainment
Particulate Matter—2.5 Micrometers or Less	Nonattainment	Attainment
Carbon Monoxide	Attainment	Attainment
Nitrogen Dioxide	Unclassifiable/Attainment	Attainment
Sulfur Dioxide	Unclassifiable/Attainment	Attainment
Lead	Attainment	Attainment
Hydrogen Sulfide		Unclassified
Sulfates	No Federal Standard	Attainment
Visibility-Reducing Particles		Unclassified

Source: SMAQMD 2024

State

CARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA).

Criteria Air Pollutants

The CCAA, adopted in 1988, required CARB to establish California Ambient Air Quality Standard (CAAQS) (as shown above in Table AQ-2). CARB has also established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter, in addition to the above-mentioned criteria air pollutants regulated by EPA. The CCAA requires that all air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practicable date. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources and provides districts with the authority to regulate indirect sources. CARB also maintains air quality monitoring stations throughout the state in conjunction with air districts. CARB uses the data collected at these stations to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

CARB is the lead agency for developing the SIPs in California. SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to the EPA for approval and publication in the Federal Register. Most recently, in March 2017, CARB adopted the *2016 State Strategy for the State Implementation Plan* (State SIP Strategy), and in October 2018, adopted the *2018 Updates to the California*

State Implementation Plan (2018 SIP Updates), describing the proposed commitment to achieve the reductions necessary from mobile sources, fuels, and consumer products to meet federal ozone and $PM_{2.5}$ standards by the specified attainment years.

CARB has established emission standards for vehicles sold in California and for various types of equipment. California gasoline specifications are governed by both state and federal agencies, which have imposed numerous requirements on the production and sale of gasoline in California during the past 30 years. In December 2004, CARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-Road Diesel Rule that are nearly identical to those finalized by EPA earlier that year. The standards required engine manufacturers to meet after-treatment–based exhaust standards for NO_X and PM, starting in 2011, that were more than 90 percent lower than then-current levels, putting emissions from off-road engines virtually on par with those from on-road, heavy-duty diesel engines. CARB has also adopted control measures for DPM and more stringent emissions standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

In 2017, Senate Bill (SB) 1 (the Road Repair and Accountability Act of 2017) was passed, which, in addition to funding transportation-related projects, requires the Department of Motor Vehicles to refuse registration or renewal or transfer of registration for certain diesel-fueled vehicles, based on weight and model year, that are subject to specified provisions relating to the reduction of emissions of DPM, oxides of nitrogen, and other criteria pollutants from in-use diesel-fueled vehicles. As of January 1, 2020, compliance with the CARB Truck and Bus regulation is now automatically verified by the California Department of Motor Vehicles as part of the vehicle registration process.

In June 2020, CARB approved the Advanced Clean Trucks regulation, requiring truck manufacturers to transition from diesel-powered trucks and vans to electric zero-emission trucks beginning in 2024 with phasing in of increasingly stringent requirements through 2045. By 2045, under the Advanced Clean Trucks regulation, every new truck sold in California will be zero-emission. This is a key element of CARB's strategy to achieve a transition in California's last mile delivery and local trucks from the use of conventional combustion technologies to zero emission everywhere feasible and near-zero emission powered by clean, low-carbon renewable fuels everywhere else. Promoting the development and use of advanced clean trucks will help CARB achieve its emission reduction strategies as outlined in the SIP, Sustainable Freight Action Plan, SB 350, and Assembly Bill (AB) 32.

Toxic Air Contaminants

As described under the federal regulations above, CARB regulates TACs, of which a subset of the identified substances are the federally identified and regulated HAPs, through statutes and regulations that generally require the use of MACT and BACT.

TACs in California are regulated primarily through the Tanner Air Toxics Act (Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act (AB 2588; Chapter 1252, Statutes of 1987). The Air Toxics Hot Spots Information and Assessment Act seeks to identify and evaluate risks from air toxics sources but does not

regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. “High-priority” facilities must perform a health risk assessment and, if specific thresholds are violated, must communicate the results to the public in the form of notices and public meetings. TACs are generally regulated through statutes and rules that require the use of MACT or BACT to limit TAC emissions.

According to the *California Almanac of Emissions and Air Quality* (CARB 2013), most of the estimated health risk from TACs is attributed to relatively few compounds, the most dominant being DPM. In 2000, CARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled vehicles and engines. Additional regulations apply to new trucks and diesel fuel. Subsequent CARB regulations on diesel emissions include the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-road Diesel Vehicle Regulation, and the New Off-road Compression Ignition Diesel Engines and Equipment Program. All of these regulations and programs have timetables by which manufacturers must comply, and existing operators must upgrade their diesel-powered equipment.

Additional state regulations have been implemented to reduce DPM emissions. Two such regulations applicable to the proposed project include Title 13, Sections 2485 and 2449 of the California Code of Regulations, which limit idling time to a maximum of 5 minutes for heavy-duty commercial diesel vehicles (defined as diesel vehicles heavier than 10,000 pounds gross vehicle rated weight) and off-road diesel-fueled construction vehicles, respectively. These regulatory measures are driven by the CARB Airborne Toxic Control Measure and subsequent amendments.

CALIFORNIA CODE OF REGULATIONS, SECTION 93105, TITLE 17, ASBESTOS AIRBORNE TOXIC CONTROL MEASURE

CARB developed an Asbestos Airborne Toxic Control Measure for Asbestos-Containing Serpentine. Construction, grading, quarrying, and surface mining in areas known to have naturally occurring asbestos can generate asbestos concentrations that represent a potential public health hazard, requiring dust control measures. This Airborne Toxic Control Measure requires small projects that disturb one acre or less to wet the soil area to be disturbed; wet, cover, or stabilize storage piles; limit vehicle speeds; clean equipment before moving it off-site; and clean up visible trackout on the paved public road. Large construction projects that disturb more than one acre are required to obtain an approved dust mitigation plan from the SMAQMD. The plan must specify measures that will be taken to control emissions of dust and must address track out prevention and removal, disturbed surface areas and storage piles that will be inactive more than seven days, on-site vehicle traffic, active storage piles, earthmoving activities, off-site transport, post construction stabilization, and air monitoring (if required by the SMAQMD). No equipment or activities shall emit dust that is visible crossing the property line.

LOCAL

CRITERIA AIR POLLUTANTS

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

SMAQMD is responsible for monitoring air pollution within the SVAB and for developing and administering programs to reduce air pollution levels below the health-based standards established by the state and federal governments. All projects within SMAQMD's jurisdictional area are subject to SMAQMD rules and regulations in effect at the time of construction. Specific SMAQMD rules that could be applicable include but are not limited to the following:

- **Rule 201:** General Permit Requirements. To provide an orderly procedure for the review of new sources of air pollution and of the modification and operation of existing sources through the issuance of permits.
- **Rule 401:** Ringlemann Chart. A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant, other than uncombined water vapor, for a period or periods aggregating more than three minutes in any one hour which is: as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure a human observer's view, or a certified calibrated in-stack opacity monitoring system to a degree equal to or greater than does smoke described in Subsection 301.1 of this rule.
- **Rule 402:** Nuisance. A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.
- **Rule 403:** Fugitive Dust. A person shall take every reasonable precaution not to cause or allow the emissions of fugitive dust from being airborne beyond the property line from which the emission originates, from any construction, handling or storage activity, or any wrecking, excavation, grading, clearing of land or solid waste disposal operation. Reasonable precautions shall include, but are not limited to:
    - Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the construction of roadways or the clearing of land.
    - Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts; and
    - Other means approved by the Air Pollution Control Officer.

- **Rule 404:** Particulate Matter. Except as otherwise provided in Rule 406 of this regulation, a person shall not discharge into the atmosphere from any source particulate matter in excess of 0.23 grams per dry standard cubic meter (0.1 grains per dry standard cubic foot).
- **Rule 405:** Dust and Condensed Fumes. A person shall not discharge into the atmosphere in any one hour from any source whatsoever dust or condensed fumes in total quantities in excess of the amount shown in the Rule's Table for Process Weight and Allowable Discharge.
- **Rule 442:** Architectural Coatings. Limit the emissions of VOCs from the use of architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within the SMAQMD.

SMAQMD has also produced a guidebook called the *CEQA Guide to Air Quality Assessment in Sacramento County* (CEQA Guide), which contains guidance for analyzing construction and operational emissions (SMAQMD 2021). The CEQA Guide provides methods to analyze air quality impacts from plans and projects, including screening criteria, thresholds of significance, calculation methods, and mitigation measures to assist lead agencies in complying with CEQA. In developing the thresholds, SMAQMD considered health-based air quality standards and the strategies to attain air quality standards, emissions projections and regional growth and land use trends.

As part of the Sacramento Federal Nonattainment Area (SFNA) for ozone, and in accordance with requirements under the CAA, SMAQMD worked with the other local air districts within the Sacramento region (El Dorado County Air Quality Management District, Feather River Air Quality Management District, Placer County Air Pollution Control District, and Yolo-Solano Air Quality Management District) to develop a regional air quality management plan to describe and demonstrate how the SFNA is meeting requirements under the federal CAA in demonstrating reasonable further progress and attainment of the NAAQS for ozone (SMAQMD 2017). Some elements of the Ozone Attainment and Progress Plan were updated in 2018 and included in the 2018 Updates to the California State Implementation Plan, which updated SIP elements for nonattainment areas throughout the state, as needed. These updates were adopted by CARB in October 2018 (CARB 2018). The SFNA, including SMAQMD, adopted the *2023 Sacramento Regional Plan for the 2015 8-Hour Ozone Standard* (2023 Ozone Plan) and submitted to the plan to CARB. CARB approved the 2023 Ozone Plan on October 26, 2023, and submitted the plan to the U.S. EPA for final review and approval as a SIP. The SFNA is classified as "serious" nonattainment for the 2015 ozone standard. As part of the plan, the SFNA air districts requested a reclassification to "severe" with an attainment deadline of August 3, 2033 (CARB 2023).

Similarly, the region prepared the $PM_{2.5}$ Maintenance Plan and Redesignation Request (SMAQMD 2013) to address how the region attained and would continue to attain the 24-hour $PM_{2.5}$ standard. In 2017, EPA found that the area attained the 2006 24-hour $PM_{2.5}$ NAAQS by the attainment date of December 31, 2015. The $PM_{2.5}$ Maintenance Plan and Redesignation Request will be updated and submitted in the future based on the clean data finding made by the EPA.

The SMAQMD also prepared the PM_{10} Implementation/Maintenance Plan and Redesignation Request for Sacramento County (SMAQMD 2010). EPA approved the PM_{10} Plan, which allowed EPA to proceed with the redesignation of Sacramento County as attainment for the PM_{10} NAAQS. The approval of the first Maintenance Plan showed maintenance from 2013 through 2023. A second plan must provide for maintenance of the NAAQS for 10 more years after expiration of the first 10-year maintenance period. The SMAQMD adopted and submitted the Second 10-Year PM_{10} Maintenance Plan for Sacramento County in August of 2021 to demonstrate maintenance of the PM_{10} standard through 2033. In September 2023, EPA proposed to approve the Second PM_{10} Maintenance Plan.

COUNTY OF SACRAMENTO GENERAL PLAN

The following goal and policies from the "Air Quality" Element of the County of Sacramento General Plan (County of Sacramento 2022) may be applicable to the project.

Goal: Improve air quality to promote the public health, safety, welfare, and environmental quality of the community.

Policy AQ-4. Developments which meet or exceed thresholds of significance for ozone precursor pollutants, and/or Greenhouse Gases (GHG) as adopted by the SMAQMD, shall be deemed to have a significant environmental impact. An Air Quality Mitigation Plan and/or a GHG Reduction Plan shall be submitted to the County of Sacramento prior to project approval, subject to review and recommendation as to technical adequacy by the SMAQMD.

Policy AQ-11. Encourage contractors operating in the county to procure and to operate low-emission vehicles, and to seek low emission fleet status for their off-road equipment.

Policy AQ-16. Prohibit the idling of on-and off-road engines when the vehicle is not moving or when the off-road equipment is not performing work for a period of time greater than five minutes in any one-hour period.

Policy AQ-19. Require all feasible reductions in emissions for the operation of construction vehicles and equipment on major land development and roadway construction projects.

TOXIC AIR CONTAMINANTS

At the local level, air pollution control or management districts may adopt and enforce CARB control measures. Under SMAQMD Rule 201 (General Permit Requirements), Rule 202 (New Source Review), and Rule 207 (Federal Operating Permit Program), all sources that could emit TACs must obtain permits from SMAQMD. Pursuant to the Airborne Toxic Control Measure (ATCM) for Construction Grading, Quarrying, and Surface Mining Operations, owners or operators must either apply for an Asbestos Dust Mitigation Plan or test out of the ATCM requirements with a Geologic Evaluation prior to any construction activities.

Odors

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments and SMAQMD. SMAQMD Rule 402 (Nuisance) regulates odorous emissions.

Impacts And Analysis

Significance Criteria

An air quality impact would be considered significant if it would exceed any of the thresholds of significance listed below, which are based on Appendix G of the CEQA Guidelines and on SMAQMD's CEQA Guide (SMAQMD 2021). Based on Appendix G of the CEQA Guidelines, the proposed project would result in a significant impact on air quality if it would:

- conflict with or obstruct implementation of the applicable air quality plan;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard;
- expose sensitive receptors to substantial pollutant concentrations; or
- result in other emissions (such as those leading to odors) adversely affecting a substantial number or people.

As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations. Thus, pursuant to the SMAQMD-recommended thresholds for evaluating project-related air quality impacts, the proposed project would result in a significant impact on air quality if it would:

- generate construction-related criteria air pollutant or ozone precursor emissions that exceed 85 pounds per day for NO_X, or, after implementation of best management practices (BMPs), 80 pounds per day or 14.6 tons per year of PM_{10} and 82 pounds per day or 15 tons per year of $PM_{2.5}$;
- generate long-term regional criteria air pollutant or ozone precursor emissions that exceed 65 pounds per day of ROG or NO_X, 80 pounds per day or 14.6 tons per year of PM_{10} and 82 pounds per day or 15 tons per year of $PM_{2.5}$;
- generate emissions of toxic air contaminants that would cause an excess cancer risk level of more than 10 in in one million or exceed a noncarcinogenic[1] Hazard Index of 1; or

[1] Noncarcinogenic or noncancer effects are those effects other than cancer, such as emphysema or reproductive disorders that can be associated with substantial pollutant concentrations.

- result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

For cumulative impacts, SMAQMD states that, as a result of the District's approach to thresholds of significance, if a project's emissions are not anticipated to exceed the SMAQMD-recommended thresholds, as listed above, the project would not be expected to result in a cumulatively considerable contribution to a significant impact at a cumulative level (SMAQMD 2021).

METHODOLOGY

Regional and local criteria air pollutant emissions and associated impacts, as well as impacts from TACs and odors were assessed in accordance with Sacramento County and SMAQMD-recommended methodologies. The project's construction, decommissioning, and operational emissions were compared to SMAQMD's construction and operational thresholds. The California Emissions Estimator Model (CalEEMod) Version 2020.4.0[2] and OFFROAD2021 (v1.0.4)[3] were used to estimate emissions from construction, operation, and decommissioning of the project. As described in Appendix AQ-1, CalEEMod input parameters, including the construction schedule and anticipated use of construction equipment, were based on information provided by the applicant or default model assumptions if project specifics were unavailable (Dudek 2025). For the purposes of the air pollutant emissions estimates, construction was assumed to commence in March 2024 and continue through August 2025.[4] The first operational year of the project was assumed to be 2025. Project decommissioning activities are anticipated to occur 30 years[5] after the project becomes operational and would continue for approximately 12 months. Construction will commence at a later date compared to the original analytical assumptions, which would tend to produce conservative estimates that would overstate actual impacts.

Construction and decommissioning activities would require the use of off-road equipment including skid loaders, rough terrain forklifts, graders, scrapers, bulldozers, rollers,

[2] CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and GHG emissions associated with construction activities and operation of a variety of land use projects. In June 2022, the California Air Pollution Control Officers Association released a new version of CalEEMod, version 2022.1. At the time the notice of preparation (NOP) was prepared on January 19, 2022, CalEEMod 2020.4.0 was the latest version of the software available.

[3] OFFROAD is CARB's emissions inventory database for off-road diesel engines, used to quantify the amount of pollutants from thousands of engines in equipment used in industrial applications, agriculture, construction, mining, oil drilling, power generation, and many other industries. OFFROAD2021 is anticipated to be the most current available and approved source to be used to generate emissions factors for the all-terrain vehicles (ATVs) anticipated to be used for the project.

[4] As construction occurs in later years, exhaust-related emissions are anticipated to result in lower levels of emissions. Therefore, actual emissions from the construction activities may be lower than what was quantified due to advancements in engine technology, retrofits, and equipment fleet turnover as stricter regulatory standards take effect since construction activities would occur after March 2024.

[5] Project decommissioning activities were assumed to occur 30 years after the project becomes operational for purposes of air quality modeling. This does not change the current anticipated facility operational life of 35 years, as noted in Chapter 2, "Project Description".

tractors/loaders/backhoes, excavators, rollers, cranes, and all-terrain vehicles. Construction activities would also require rock blasting to excavate, break down, and remove rock. Some of the rock created by blasting would be crushed, resulting in particulate emissions, as well as emissions of ozone precursors (ROG and NO_X), SO, and SO_X from the use of explosives. The emissions created by blasting and crushing were calculated using the EPA's Compilation of Emission Factors (AP-42) as described in Appendix AQ-1. During site preparation, excess grading materials will be spread evenly across the site resulting in no offsite export or import. For the switchyard, 7,500 cubic yards of soil will be exported. The analysis conservatively assumed a 75-mile one-way trip distance to Vallejo for off-site disposal. Since the truck trips would potentially travel outside of the SMAQMD jurisdiction for disposal of the soil, emissions associated with the haul trucks were apportioned to the surrounding air districts of Bay Area Air Quality Management District (BAAQMD) and Yolo-Solano Air Quality Management District (YSAQMD) for comparison to their recommended thresholds of significance. Additionally, it was assumed that worker vehicles would travel on average approximately half a mile on unpaved roads over the course of construction to account for travel to laydown locations. The project would be required to comply with the SMAQMD Rule 403 to control dust emissions generated during any dust-generating activities. Finally, it was assumed that water used during construction activities would be trucked to the project site from a water purveyor located approximately 24 miles from the project site.

Operational activities would include regular inspection and maintenance activities associated with operation of the facility and would generate area and mobile source emissions of criteria air pollutants. Area-source emissions associated with landscape/maintenance equipment were also calculated. Mobile source emissions account for up to 10 trips per day anticipated to result from inspection and maintenance activities. An additional 32 trips per day were also included to account for water being trucked in for panel washing and sheep/goat grazing activity.

For additional details regarding the air quality methodology and assumptions, please refer to Appendix AQ-1, *Air Quality and Greenhouse Gas Calculations Memorandum for the Coyote Creek Agrivoltaic Ranch Project*.

A health risk assessment (HRA) was performed to evaluate potential health risk associated with construction of the project. For risk assessment purposes, the analysis conservatively assumed PM_{10} exhaust to be representative of DPM, which the CARB identified as a TAC in 1998. DPM, originates mainly from combustion engines in off-road diesel construction equipment (e.g., bulldozers; graders). Less-intensive, more-dispersed emissions result from on-road vehicle exhaust (e.g., heavy-duty diesel trucks). The HRA analysis assumed DPM emissions from diesel trucks in close proximity to the site with a trip length of 0.25 mile. The HRA followed the Office of Environmental Health Hazard Assessment (OEHHA) 2015 guidelines (OEHHA 2015) and SMAQMD guidance to calculate the health risk impacts at all proximate receptors as further discussed in Appendix AQ-1, *Air Quality and Greenhouse Gas Calculations Memorandum for the Coyote Creek Agrivoltaic Ranch Project*.

IMPACT AQ-1: CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY PLAN?

Air quality plans describe air pollution control strategies to be implemented by a city, county, or regional air district. The applicable air quality plans are described in the Regulatory Setting section above. The primary purpose of an air quality plan is to bring an area that does not attain the NAAQS or CAAQS into compliance with those standards, or to maintain existing compliance with those standards, pursuant to the requirements of the CAA and CCAA.

CONSTRUCTION AND DECOMMISSIONING

Construction and decommissioning activities associated with the proposed project would result in emissions of criteria air pollutants and ozone precursors, including ROG, NO_X, PM_{10}, and $PM_{2.5}$, the pollutants for which the project region is designated as nonattainment for either the NAAQS or CAAQS, as shown in Table AQ-3. SMAQMD has adopted air quality plans pursuant to regulatory requirements under EPA and CARB for the attainment and maintenance of the NAAQS and CAAQS, as detailed above in "Regulatory Setting" under "Sacramento Metropolitan Air Quality Management District." The goal of the air quality plans is to reduce criteria pollutant emissions for which the SVAB is designated as nonattainment in order to achieve the NAAQS and CAAQS by the earliest practicable date. As documented in the SMAQMD CEQA Guide (SMAQMD 2021), the SMAQMD construction and operational mass emissions threshold for ozone precursors correlate to the NO_X and ROG reductions from heavy-duty vehicles and land use projects committed to in the 2004 Ozone Attachment Plan for the Sacramento Federal Ozone Nonattainment Area; therefore, projects whose emissions would be less than the recommended thresholds of significance for criteria air pollutants would not conflict with or obstruct implementation of applicable air quality plans related to the attainment of ozone. Similarly, the construction and operational mass emissions thresholds for PM correlate to the SMAQMD's permitting offset trigger levels[6] and represent the emission levels above which a project's individual emissions would result in an individually or cumulatively considerable contribution to the County's existing air quality conditions. These emission levels prevent deterioration of ambient air quality and a regionally cumulative significant impact by ensuring projects do not worsen the region's attainment status (SMAQMD 2015). Therefore, projects whose emissions do not exceed the recommended non-zero PM thresholds of significance, with implementation of fugitive dust control practices, would also not conflict with or obstruct implementation of the applicable air quality plans related to PM.

Construction activities associated with the proposed project would result in a temporary increase in criteria pollutant and ozone precursor emissions in the form of both fugitive dust from ground disturbing activities, including site preparation, grading, and travel on

[6] SMAQMD rules require stationary sources that emit pollutants in excess of certain levels to implement best available control technology (BACT) and provide offsets. The PM BACT threshold is zero, and the offset threshold is 14.6 tons per year for PM_{10} and 15 tons/year for $PM_{2.5}$. Requiring projects to implement BACT and best management practices is reasonable because it mirrors the CAA approach to reducing emissions and attaining the federal CAA standards.

paved and unpaved roadways, and exhaust emissions from the use of construction equipment and operation of worker vehicles and vendor and haul trucks.

Decommissioning activities would also result in a temporary increase in criteria air pollutant and ozone precursor emissions associated with fugitive dust during system removal and demolition, site restoration, and travel on paved and unpaved roadways, and exhaust emissions from the use of construction equipment and operation of worker vehicles and vendor and haul trucks.

The proposed project construction-related and decommissioning activities would be required to comply with SMAQMD rules and regulations established, in part, to ensure implementation of and consistency with strategies and actions of the applicable air quality plans, including but not limited to Rule 401, Rule 402, Rule 403, Rule 404, and Rule 405. Since the proposed project would generate PM emissions during construction and decommissioning activities, implementation of best management practices would be required in order to use the SMAQMD non-zero thresholds of significance for PM. As detailed below in Impact AQ-2 and shown in Table AQ-4, emissions generated during construction could exceed the SMAQMD thresholds of significance for NO_X and PM_{10}. Therefore, the project's construction and decommissioning activities could result in a potentially significant temporary contribution to regional air pollution and thereby could conflict with applicable SMAQMD air quality plans, including the Ozone Attainment and Progress Plan, $PM_{2.5}$ Maintenance Plan, and PM_{10} Implementation/Maintenance Plan. Similarly, for these same reasons, the County's General Plan policies related to air quality require feasible strategies to reduce ozone precursors and particular matter. This impact would be **potentially significant**.

OPERATIONS

Operational activities associated with the project would include regular inspection and maintenance activities, as detailed in Appendix AQ-1. As detailed below in Impact AQ-2 and shown in Table AQ-7, proposed operational activities would result in the generation of criteria air pollutant emissions. Since the project would generate PM emissions during operations from vehicle trips associated with regular inspections, maintenance, and water trucked in for panel washing and grazing, along with emergency generators, implementation of best management practices would be required in order to apply the SMAQMD non-zero thresholds of significance for PM. As shown in Table AQ-7, operational emissions would not exceed the recommended SMAQMD non-zero thresholds of significance. In addition, operation of the project would result in the generation of energy from a renewable, carbon-free resource that would support the increasing contribution of clean energy resources to the overall regional power mix and related reduction in criteria air pollutants emissions associated with energy generation. While the project may not result in a direct offset of energy-related criteria air pollutant emissions in the region, and such emissions 'credits' were not accounted for in the net operational emissions calculations, the operation of the project would provide a source of electricity that does not generate criteria air pollutant emissions.

However, since the project's operational activities would generate PM emissions during routine maintenance activities, the proposed project may conflict with or obstruct

implementation of applicable air quality plans if the applicable best management practices were not implemented. This impact would be **potentially significant**.

Mitigation Measures

The following recommended mitigation measures are detailed below under the discussion of **Impact AQ-2: Mitigation Measures AQ-2a through AQ-2e.**

- *Implement Mitigation Measures AQ-2a, AQ-2b, AQ-2c, AQ-2d, and AQ-2e.*

Significance After Mitigation

Construction

Mitigation Measure AQ-2a includes the SMAQMD Basic Construction Measures/BMPs for fugitive dust control, as well as Enhanced Fugitive PM Dust Control Practices, to reduce the generation of on-site fugitive dust during earthwork and travel on unpaved roadways, to maintain equipment in good operating condition, and minimize equipment idling times as required by California Code of Regulations. Mitigation Measure AQ-2b requires that off-road diesel-powered equipment subject to CARB regulations meet or exceed Tier 4 Final emission standards. Mitigated emissions estimates are provided under the discussion of Impact AQ-2 in Table AQ-8, based on implementation of Mitigation Measures AQ-2a and AQ-2b. As shown in Table AQ-8, estimated emissions of NO_X and PM_{10} would still exceed SMAQMD's thresholds of significance.[7] Mitigation Measure AQ-2c would require the construction contractor to submit a Construction Emissions Control Plan, consisting of the proposed equipment inventory, proposed heavy-duty vehicle fleet, and calculation of the proposed project's construction emissions for comparison to the SMAQMD's thresholds of significance. Mitigation Measure AQ-2d would require participation in the SMAQMD's off-site mitigation fee program through the purchase of the required offsets needed based the SMAQMD's offset mitigation fee program and would ensure that NO_X and PM_{10} emissions would be offset to a level that would not exceed the SMAQMD thresholds of significance for NO_X and PM_{10}.[8] Therefore, with implementation of Mitigation Measures AQ-2a through AQ-2d, the project's construction and decommissioning emissions would be reduced to a level below the thresholds of significance, would not conflict with air quality plans applicable to the SMAQMD, and would be consistent with the applicable County General Plan policies related to air pollutant emission reduction strategies. This impact would be **less than significant with mitigation.**

Operations

As described below under Impact AQ-2, project operational emissions associated with routine maintenance activities could generate PM emissions that would exceed the SMAQMD's zero threshold for PM emissions. Therefore, implementation of Mitigation Measure AQ-2e would be required to utilize the SMAQMD's non-zero thresholds. With implementation of Mitigation Measure AQ-2e, best management practices would be

[7] Non-zero threshold for PM_{10}.

[8] Non-zero threshold for PM_{10}.

implemented such that the project's operational PM emissions associated with routine maintenance activities would be reduced to a level below the threshold of significance. As such, the project's operational emissions would also not conflict with air quality plans applicable to the SMAQMD. This impact would be **less than significant with mitigation.**

Impact AQ-2: Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Project Region is Non-attainment Under an Applicable Federal or State Ambient Air Quality Standard?

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the SVAB, and this regional impact is cumulative rather than being attributable to any one source. A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects.

The thresholds developed by the SMAQMD are designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards. Projects that would exceed the SMAQMD-recommended thresholds of significance would be considered to potentially contribute a cumulatively considerable net increase of criteria air pollutant emissions to the region.

Construction and Decommissioning

Construction- and decommissioning-related emissions are temporary and would cease after the completion of the project's construction phase and decommissioning phase but would have the potential to adversely affect the region's air quality.

The project's maximum daily and annual emissions associated with construction and decommissioning activities are presented below in Table AQ-4, and compared to the SMAQMD-recommended thresholds of significance for construction. As described above under "Significance Criteria," the SMAQMD recommended thresholds of significance for PM are 80 pounds per day or 14.6 tons per year of PM_{10} and 82 pounds per day or 15 tons per year of $PM_{2.5}$, after implementation of BMPs. The BMPs are Basic Construction Emission Control Practices that are considered feasible for controlling fugitive dust from a construction site, allowing the use of the non-zero PM significance threshold. Consistent with the SMAQMD CEQA Guide, these BMPs have been included as a Mitigation Measure (see Mitigation Measure AQ-2a below) to ensure compliance.

Table AQ-4: Summary of Maximum Unmitigated Daily and Annual Construction- and Decommissioning-Related Emissions of Criteria Air Pollutants and Precursors

Description	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} [1] (lbs/day)	$PM_{2.5}$ [1] (lbs/day)	PM_{10} [1] (tons/year)	$PM_{2.5}$ [1] (tons/year)
Construction Emissions [2]	**100.34**	**357.61**	**297.73**	**40.97**	**15.2**	**2.4**
SMAQMD Threshold of Significance	N/A	85	80	82	14.6	15
Threshold Exceeded?	N/A	**Yes**	**Yes**	No	**Yes**	No
Decommissioning Emissions	**21.54**	**48.66**	**219.02**	**24.17**	**16.4**	**1.8**
SMAQMD Threshold of Significance	N/A	85	80	82	14.6	15
Threshold Exceeded?	N/A	No	**Yes**	No	**Yes**	No

Notes: NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

1 PM emissions include implementation of fugitive dust control measures listed as BMPs; therefore, this analysis utilized the non-zero SMAQMD recommended PM significance threshold.

2 Construction is conservatively anticipated to occur in 2024 and 2025. Appendix AQ-1 includes daily emission rates for each year of construction. The maximum daily emission rate between construction years is included in this table.

Source: See Appendix AQ-1 for detailed construction assumptions and calculations.

As described previously, truck trips would potentially travel outside of the SMAQMD jurisdiction for disposal of the excavated soil from the switchyard. As such, mobile source emissions associated with the haul truck trips were apportioned to the surrounding air districts of the YSAQMD and BAAQMD for comparison to their respective recommended thresholds of significance. Even if the mobile-source emissions are not apportioned, the cumulative amount of the emissions are well below the significance threshold in each air district. Table AQ-5 and Table AQ-6 present the emissions associated with the haul truck trips required during construction for comparison to the YSAQMD and BAAQMD recommended thresholds of significance, respectively.

Table AQ-5: Summary of Maximum Daily and Annual Haul Truck Trip Related Criteria Air Pollutants and Precursors for Comparison to YSAQMD Thresholds

Emissions Source	ROG (tons/year)	NO_X (tons/year)	PM_{10} (lbs/day)
Emissions [1]	**0.04**	**0.17**	**1.25**
YSAQMD Threshold of Significance	10	10	80
Threshold Exceeded?	No	No	No

Notes:

lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter; ROG = reactive organic gases; YSAQMD = Yolo-Solano Air Quality Management District

1 Construction is anticipated to occur in 2024 and 2025. Appendix AQ-1 includes daily emission rates for each year of construction. The maximum daily emission rate between construction years is included in this table.

Source: See Appendix AQ-1 for detailed construction assumptions and calculations.

Table AQ-6: Summary of Maximum Daily Haul Truck Trip Related Criteria Air Pollutants and Precursors for Comparison to BAAQMD Thresholds

Emissions Source	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} Exhaust (lbs/day)	$PM_{2.5}$ Exhaust (lbs/day)
Emissions [1]	**0.94**	**1.86**	**0.01**	**0.01**
BAAQMD Threshold of Significance [2]	54	54	82	54
Threshold Exceeded?	No	No	No	No

Notes:

BAAQMD = Bay Area Air Quality Management District; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter; ROG = reactive organic gases

1 Construction is anticipated to occur in 2024 and 2025. Appendix AQ-1 includes daily emission rates for each year of construction. The maximum daily emission rate between construction years is included in this table.

2 This analysis conservatively compares maximum daily emissions for haul trips to the BAAQMD's average daily emissions thresholds.

Source: See Appendix AQ-1 for detailed construction assumptions and calculations.

As shown in Table AQ-5 and Table AQ-6, emissions that may occur in the surrounding air districts would not exceed the recommended thresholds of significance. However, as shown in Table AQ-4, the project's maximum daily construction emissions would exceed the SMAQMD's recommended thresholds for NO_X, an ozone precursor, and PM_{10}[9]; the project's maximum annual construction emissions would exceed the SMAQMD's recommended non-zero threshold for PM_{10}. This level of emissions would result in a potentially significant impact due to the region's non-attainment status for ozone and PM_{10}. The SMAQMD thresholds of significance are considered the allowable amount of emissions each project can generate without resulting in a cumulatively considerable net increase of criteria air pollutants and precursor emissions. Consequently, because construction of the project could generate construction-related emissions that exceed the

[9] Non-zero threshold for PM_{10}.

SMAQMD-recommended thresholds, this impact for the construction phase of the project would be **potentially significant**.

Operations

Operational emissions would result from daily routine and maintenance activities, such as panel washing. Maximum daily emissions (in pounds per day) and annual emissions (in tons per year) are presented in Table AQ-7.

Table AQ-7: Summary of Maximum Daily and Annual Operational Emissions of Criteria Air Pollutants and Precursors

Emissions Source	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} [1] (lbs/day)	$PM_{2.5}$ [1] (lbs/day)	PM_{10} [1] (tons/year)	$PM_{2.5}$ [1] (tons/year)
Emissions	**3.70**	**14.90**	**0.86**	**0.58**	**0.07**	**0.03**
SMAQMD Threshold of Significance	65	65	80	82	14.6	15
Threshold Exceeded?	No	No	No	No	No	No

Notes:
BMP = best management practices; lbs/day = pounds per day; NO_X = nitrogen oxides; PM = particulate matter; PM_{10} = particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District; tons/year = tons per year
[1] PM emissions include implementation of fugitive dust control measures listed as BMPs; therefore, this analysis utilized the non-zero SMAQMD recommended PM significance threshold.
Source: See Appendix AQ-1 for detailed construction assumptions and calculations.

As shown in Table AQ-7, maximum daily and annual operational emissions would not exceed the SMAQMD-recommended thresholds of significance. Since the project would generate PM emissions during operation, implementation of BMPs would be required in order to use the SMAQMD non-zero thresholds of significance. Therefore, this impact would be **potentially significant** without implementation of BMPs.

Mitigation Measures

AQ-2a. Implement Basic Construction Emission Control Practices (Best Management Practices) and Enhanced Fugitive PM Dust Control Practices during Construction and Decommissioning.

- The applicant shall include as a condition of the construction and decommissioning bidding, incorporation of dust control measures that shall include, at a minimum, the requirements of SMAQMD Rule 403. All fugitive dust control measures shall be shown on grading, improvement, and demolition plans, to be initiated at the start and maintained throughout the duration of construction and decommissioning.

- Water all exposed active work areas two times daily, or with adequate frequency for continued moist soil. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads. However, do not overwater to the extent that sediment flows off the site.

- Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.

- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.

- Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).

- Suspend excavation, grading, and/or demolition activity when average wind speeds exceed 20 mph.

- All roadways, driveways, sidewalks, parking lots to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.

- Install wheel washers, rattle plates and/or rock aprons for all exiting trucks or equipment leaving the site.

- Treat site accesses from the paved road with a 6 to 12- inch layer of gravel to reduce generation of road dust and road dust carryout onto public roads.

- Post a publicly visible sign with the telephone number and person to contact at the County of Sacramento regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the SMAQMD shall also be visible to ensure compliance.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes [California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Provide clear signage that posts this requirement for workers at the entrances to the site.

- Provide current certificate(s) of compliance for CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation [California Code of Regulations, Title 13, sections 2449 and 2449.1]. For more information contact CARB at 877-593-6677, doors@arb.ca.gov, or www.arb.ca.gov/doors/compliance_cert1.html.

- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determine to be running in proper condition before it is operated.

AQ-2b. Reduce Off-Road Equipment Exhaust-Related Emissions during Construction and Decommissioning.

- The applicant shall require off-road diesel-fueled equipment with engines larger than 50 horsepower to meet or exceed EPA/CARB Tier 4 Final emissions standards. An exemption from these requirements may be granted by the County if the County documents that equipment with the required tier is not reasonably available and corresponding reductions in criteria air pollutant emissions are achieved from other construction equipment (see completion of the Construction Emissions Control Plan in Mitigation Measure AQ-2c below). Before an exemption may be considered by the County, the applicant shall be required to demonstrate that two construction fleet owners/operators in Sacramento County were contacted and that those owners/operators confirmed Tier 4 equipment could not be located within Sacramento County.

AQ-2c. Submit Construction and Decommissioning Emissions Control Plans.

- Prior to the approval of grading plans, the construction contractor shall submit a Construction Emissions Control Plan to the SMAQMD and provide written evidence to the County of Sacramento that the plan has been submitted to and approved by SMAQMD. The applicant shall not initiate any on-site or off-site construction activity until SMAQMD has approved the Construction Emissions Control Plan.

The Construction Emissions Control Plan shall include the following:

- The contractor shall submit to the SMAQMD a comprehensive equipment inventory (e.g., make, model, year, emission (tier) rating, projected hours of use, and CARB equipment identification number) of all the heavy-duty off-road equipment (50 horsepower or greater) that will be used. If any new equipment is added after submission of the inventory, the contractor shall notify the SMAQMD before using the new equipment. At least three business days before the use of subject heavy-duty off-road equipment, the project representative shall provide the SMAQMD with the anticipated construction timeline including start date, name, and phone number of the property owner, project manager, and on-site foreman.

- The contractor shall submit to the SMAQMD an anticipated off-site heavy-duty truck trip activity schedule (duration of truck trip activity, anticipated origin/destination of truck trips, and estimated total and daily truck trips per day) and anticipated truck fleet inventory (e.g., make, model, engine year).

- With submittal of the equipment inventory and anticipated on-road heavy-duty truck trip activity, the contractor shall provide a written calculation of the project's total and daily construction emissions to the SMAQMD for approval. If any new equipment or haul truck activity is added after the submission and

approval of the inventory, the construction contractor shall update the inventory and construction emissions calculations and provide to the SMAQMD and County of Sacramento prior to the use of such equipment and trucks. The emissions calculations shall be calculated using the SMAQMD's Construction Mitigation Calculator; this tool is currently available on the SMAQMD's website at the following link: http://www.airquality.org/businesses/ceqa-land-use-planning/mitigation.

- Prior to decommissioning of the facility, the construction contractor shall submit a Construction Emissions Control Plan, subject to the same requirements and stipulations as described above.

AQ-2d. Off-Site Construction and Decommissioning Mitigation.

- If, based upon the incorporation of all measures described above in Mitigation Measures AQ-2a through AQ-2c, NO_X or PM_{10} emissions still exceed the daily SMAQMD threshold for NO_X and the non-zero threshold for PM_{10}, the project shall participate in the SMAQMD's Offsite Mitigation Program by paying to SMAQMD a mitigation fee for construction and decommissioning activities, to be determined at the time of construction and decommissioning based on the submitted equipment inventories and heavy-duty truck activity and emissions calculations for NO_X and PM_{10} emissions, such that emissions are reduced to a less-than-significant level. The fee calculation to mitigate daily emissions shall be based on the SMAQMD mitigation fee rate, which is reviewed and adjusted annually, if needed. The current mitigation fee rate is $30,000 per ton of emissions with a 5 percent administrative fee in addition to the mitigation fee. The total fee shall be determined based on the total emissions reductions of NO_X and PM_{10} needed to reduce emissions to be less than the SMAQMD thresholds of 85 pounds per day for NO_X and 80 pounds per day for PM_{10} (the non-zero threshold for PM_{10}). The fee shall be submitted for approval by SMAQMD as the total required to achieve emissions reductions that would reduce total emissions to a less-than-significant level after all other mitigation measures are implemented. The fee shall be calculated, approved by SMAQMD, and paid prior to the issuance of grading or improvement plans.

AQ-2e. Implement Best Management Practices for Reducing Operational PM Emissions.

The applicant shall include as a condition of building permit issuance, the following best management practices for fugitive dust control during operational and maintenance activities associated with the project:

- Limit vehicle speeds on unpaved roads to 15 mph.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes [California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Provide clear signage that posts this requirement for workers at the entrances to the site.

- Compliance with anti-idling regulations for diesel powered commercial motor vehicles (greater than 10,000 gross vehicular weight rating). The current requirements include limiting idling time to 5 minutes and installing technologies on the vehicles that support anti-idling. Information can be found on the California Air Resources Board's website: https://ww2.arb.ca.gov/ourwork/programs/idle-reduction-technologies/idle-reduction-technologies.

Significance After Mitigation

Construction and Decommissioning

Project construction and decommissioning activities would result in NO_X and PM_{10} emissions that would exceed SMAQMD-recommended threshold of significance for NO_X and the non-zero threshold for PM_{10}, as shown in Table AQ-4. Mitigation Measure AQ-2a includes the SMAQMD Basic Construction Measures/BMPs for fugitive dust control, as well as Enhanced Fugitive PM Dust Control Practices, to reduce the generation of on-site fugitive dust during earthwork and travel on unpaved roadways, to maintain equipment in good operating condition, and minimize equipment idling times as required by California Code of Regulations. Mitigation Measure AQ-2b requires that off-road diesel-powered equipment greater than 50 horsepower used for construction activities meet or exceed Tier 4 Final emission standards. Mitigated emissions estimates are shown in Table AQ-8, based on implementation of Mitigation Measures AQ-2a and AQ-2b.

Table AQ-8: Summary of Mitigated Maximum Daily and Annual Construction- and Decommissioning-Related Emissions of Criteria Air Pollutants and Precursors

Emissions Source	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
Construction Emissions [1]	**89.94**	**246.44**	**229.29**	**30.21**	**12.3**	**1.8**
SMAQMD Threshold of Significance	N/A	85	80	82	14.6	15
Threshold Exceeded?	N/A	**Yes**	**Yes**	No	No	No
Decommissioning Emissions	**19.10**	**43.82**	**156.24**	**17.83**	**12.0**	**1.4**
SMAQMD Threshold of Significance	N/A	85	80	82	14.6	15
Threshold Exceeded?	N/A	No	**Yes**	No	No	No

Notes:

lbs/day = pounds per day; N/A = not applicable; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

[1] Construction is conservatively anticipated to occur in 2024 and 2025. Appendix AQ-1 includes daily emission rates for each year of construction. The maximum daily emission rate between construction years is included in this table.

Source: See Appendix AQ-1 for detailed construction assumptions and calculations.

As shown in Table AQ-8, Mitigation Measures AQ-2a and AQ-2b would reduce NO_X and PM_{10} emissions associated with project construction. However, even with inclusion of these mitigation measures, emissions of NO_X and PM_{10} would still exceed SMAQMD's daily thresholds of significance[10]. As such, Mitigation Measure AQ-2c would require the construction contractor to submit a Construction Emissions Control Plan, consisting of the proposed equipment inventory, proposed heavy-duty vehicle fleet, and calculation of the project's construction emissions for comparison to the SMAQMD's thresholds of significance. Mitigation Measure AQ-2d would require participation in the SMAQMD's off-site mitigation fee program and ensure that NO_X and PM_{10} emissions would be offset to a level that would not exceed the SMAQMD thresholds of significance for NO_X and PM_{10}. Therefore, with implementation of Mitigation Measures AQ-2a through AQ-2d, this impact for construction would be **less than significant with mitigation**.

OPERATION

Project operational activities would result in emissions of PM associated with daily routine and maintenance activities, such as panel washing. Therefore, implementation of best management practices during operational activities is required in order to support the use of the SMAQMD's non-zero thresholds of significance for operational PM emissions, as shown in Table AQ-7. Mitigation Measure AQ-2e would ensure compliance with the applicable operational best management practices to reduce PM emissions. With implementation of Mitigation Measure AQ-2e, this impact for operation would be **less than significant with mitigation**.

IMPACT AQ-3: EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS?

As detailed in "Environmental Setting," under "Sensitive Receptors," the project site is generally surrounded by agricultural and recreational land uses. Sensitive land uses in the broader vicinity of the project site include single-family residences. The nearest sensitive receptor to the proposed project facilities is a residence along the entrance to the Prairie City State Vehicular Recreation Area approximately 3,200 feet north of the proposed project facilities, as measured at the closest point to proposed construction and decommissioning activities.

TAC EMISSIONS – CONSTRUCTION AND DECOMMISSIONING

Construction and decommissioning of the proposed project would generate emissions of TACs from a variety of sources, including the use of off-road construction equipment and on-road vehicles. These activities may expose nearby receptors to TACs, including residents surrounding the project site. The greatest potential for TAC emissions during construction and decommissioning would be related to DPM emissions associated with operation of heavy-duty construction equipment and diesel haul trucks. More than 90 percent of DPM is less than 1 micrometer in diameter, and thus is a subset of $PM_{2.5}$

[10] Non-zero threshold for PM_{10}.

(CARB n.d.). Exhaust PM_{10} is conservatively used as the upper limit for DPM emissions associated with construction of the proposed project.

As described above, the nearest sensitive receptor to the proposed project facilities is a residence along the entrance to the Prairie City State Vehicular Recreation Area approximately 3,200 feet north of the northern boundary of the proposed project site. However, construction and decommissioning activities would occur throughout the 2,704-acre project site – construction activities would occur up to over 20,000 feet (approximately 3.78 miles) away from the nearest sensitive receptor (a residence) and most construction and decommissioning activities would occur at a distance of between 3,200 feet and 20,000 feet from the nearest sensitive receptor. Health risk is a function of the concentration of contaminants in the environment and the duration of exposure to those contaminants. The risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. Health effects from TACs are often described in terms of individual cancer risk, which is based on a 30-year lifetime exposure to TACs (OEHHA 2015). Construction and decommissioning activities would be temporary, lasting approximately 18 months and one year, respectively. The anticipated off-road equipment and activity schedule, including the phasing of construction and decommissioning activities, is included in Appendix AQ-1.

As described in the Methodology section above, an HRA was conducted to evaluate potential health risk associated with construction of the project. The HRA estimated the maximum individual cancer risk and the chronic hazard index as a result of project construction. Results of the construction HRA are presented in Table AQ-9.

Table AQ-9: Construction Health Risk Assessment Results - Unmitigated

Impact Parameter	Units	Project Impact	SMAQMD Threshold
Maximum Individual Cancer Risk at the MEIR	per Million	0.7	10
Chronic Hazard Index	Index Value	0.001	1.0

Notes: MEIR = Maximally Exposed Individual Receptor; SMAQMD = Sacramento Metropolitan Air Quality Management District
Source: See Appendix AQ-1 for detailed HRA assumptions and results.

As shown in Table AQ-9, both the maximum individual cancer risk and the chronic hazard index are below the respective SMAQMD thresholds. Therefore, the TAC health risk impacts from construction-related exhaust emissions would be **less than significant.** Additionally, Mitigation Measure AQ-2b would further reduce TAC health risk impacts by requiring off-road diesel-powered equipment larger than 50 horsepower to meet or exceed EPA/CARB Tier 4 Final emissions standards.

To evaluate potential health risk impacts associated with decommissioning activities, the estimated construction emissions and associated health risk impact is used for comparison to the estimated decommissioning emissions. As shown in Table AQ-4, unmitigated emissions of PM_{10} estimated for decommissioning-related activities are approximately 26 percent lower than PM_{10} emissions estimated for construction. The

unmitigated maximum individual cancer risk and chronic hazard index for construction, as calculated by the HRA and indicated in Table AQ-9, are 0.7 in one million and 0.001, respectively. Both the unmitigated maximum individual cancer risk and chronic hazard index for construction are well below the SMAQMD significance thresholds. Therefore, because the construction HRA results indicate the health risk impacts would be less than significant, and because the decommissioning emissions would be approximately 26 percent lower than the construction emissions, the health risk impacts associated with decommissioning activities would also be below the SMAQMD thresholds. Additionally, project decommissioning would also be required to comply with all applicable SMAQMD rules and regulations and CARB Airborne Toxics Control Measures, including idling restrictions. Due to the intermittent and temporary nature of decommissioning activities at any given location and the dispersive properties of TACs, temporary decommissioning activities would not expose sensitive receptors to DPM emission levels that would result in a health hazard. This decommissioning health risk impact would be **less than significant**. Implementation of Mitigation Measures AQ-2a and AQ-2b would further reduce this impact.

TAC Emissions – Operations

As described above in Impact AQ-2, operational activities would include routine maintenance and inspection activities. Daily emission estimates, assuming maintenance activities of up to 42 daily trips, results in estimated operational emissions that would be less than one pound per day of PM_{10} and $PM_{2.5}$, as shown in Table AQ-7. The majority of these emissions would be generated by vehicle travel occurring off-site from staff traveling to and from the project and from vehicle trips to transport water for panel washing and livestock grazing, and would generally not be proximate to the project site perimeter and nearby residences. Panel washing would be infrequent, occurring one to four times per year, depending on site conditions, with each panel washing cycle requiring 14 days to complete. Because the project site is currently used cattle grazing, project vehicle trips for water for livestock grazing would not substantially increase compared to existing conditions. The infrequent vehicle trips associated with maintenance and daily staff vehicle trips are not substantial sources of TAC emissions (e.g., DPM). Therefore, operational emissions would not be considered a substantial source of TACs and this impact related to operational TAC emissions would be **less than significant**. Implementation of the Mitigation Measure AQ-2e would further reduce operational TAC emissions.

Naturally Occurring Asbestos (NOA)

As described above in “Toxic Air Contaminants”, according to the California Department of Conservation *Special Report 192: Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California* the project site is located within areas categorized as moderately likely and least likely to contain NOA (California Department of Conservation 2006). Exposure to soil dust containing asbestos can occur under a variety of scenarios, including grading and earth disturbing activities. The SMAQMD CEQA Guide states that the impact related to asbestos exposure shall be considered potentially significant if a project would be located in an area moderately likely

to contain NOA. Therefore, this impact for constructed- and decommissioning-related asbestos exposure is considered **potentially significant.**

Criteria Air Pollutant Emissions

Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition.

As detailed in "Environmental Setting", exposure to criteria air pollutants can result in adverse health effects. The proposed project would primarily generate criteria air pollutant emissions during the construction phase, and the primary pollutants of concern would be ozone precursors (ROG and NO_X) and PM. Adverse health effects induced by regional criteria pollutant emissions generated by the proposed project (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale, where emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollutant may be transported over long distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project.

Existing models have limited sensitivity to small changes in regional criteria pollutant concentrations, and as such, translating project-generated regional criteria pollutants to specific health effects would not produce meaningful results. In other words, minor increases in regional air pollution from project-generated ROG and NO_X would have nominal or negligible impacts on human health. Currently, CARB and EPA have not approved a quantitative method to meaningfully and consistently translate the mass emissions of criteria air pollutants from a project to quantified health effects.

In 2020, SMAQMD published Guidance to Address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District (SMAQMD 2020), which provides a screening level analysis estimating the health effects of criteria air pollutants and their precursors, as well as provides guidance for conducting a health effects analysis of a project that is consistent with the *Sierra Club v. County of Fresno* decision. The Guidance was prepared by conducting regional photochemical modeling and relies on the EPA's Benefits Mapping and Analysis Program to assess health impacts from ozone and $PM_{2.5}$. Analysis was conducted to estimate the level of health effects for a proposed project that has emissions at the maximum SMAQMD-recommended non-zero thresholds of significance using 41 hypothetical project locations, as well as a screening model conducted to estimate potential health effects for strategic areas where development is anticipated to cause exceedance of thresholds of significance. The results were used to develop two screening

tools intended to support individual projects in analyzing health risks from criteria pollutants: the Minor Project Health screening Tool for projects with criteria pollutant emissions below SMAQMD's adopted thresholds of significance, and the Strategic Area Project Health Screening Tool for projects with emissions between two and six times the SMAQMD threshold levels.

The modeling results of the SMAQMD screening modeling support a conclusion that any one proposed project in the SFNA, which is inclusive of the proposed project site, with emissions at or below the maximum SMAQMD thresholds of significance levels for criteria air pollutants does not on its own lead to sizeable health effects. The findings of the SMAQMD screening modeling indicate that the mean health incidence for a project emitting at the threshold of significance levels at all 41 representative locations was less than 3 per year for mortality and less than 1.5 per year for other health outcomes evaluated. At the strategic area locations, as expected, mean health incidences are higher than the Minor Projects Health Effects Screening Tool. The maximum reported mortality rate is 22 incidences per year and all other health outcomes evaluated are under 9 per year from a project emitting 656 pounds/day of each NO_X, ROG, and $PM_{2.5}$ at the downtown Sacramento location.

As shown in Table AQ-4, construction-related emissions associated with the proposed project would exceed the SMAQMD threshold of significance for NO_X and the non-zero threshold of significance for PM_{10}. NO_X emissions associated with project construction activities would be approximately 4.2 times the threshold, while PM_{10} emissions would be approximately 3.7 times the non-zero threshold. After implementation of Mitigation Measure Measures AQ-2a and AQ-2b, daily emissions during construction would be approximately 2.9 times the threshold for NO_X and 2.9 times the non-zero threshold for PM_{10}. For illustrative purposes for this impact discussion, the SMAQMD Strategic Area Project Health Screening Tool was used to evaluate the potential regional effect of the proposed project construction-related emissions on regional health. Proposed project operational emissions would be minimal, and decommissioning emissions would also be lower and occur over a shorter duration than the estimated emissions for construction; therefore, the construction-related emissions estimates reflect a worst-case scenario. The evaluation assumed the maximum daily emissions of ROG, NO_X, and $PM_{2.5}$. As described above, in accordance with the SMAQMD CEQA Guidance, the screening tool for emissions between 2 times and 8 times the maximum threshold of significance was applied. The screening tool estimates that a project at the strategic growth area location of Rancho Cordova (the nearest growth area location to the project site available within the Strategic Area Project Health Screening Tool), approximately 6.5 miles west of the proposed project site, emitting 100 pounds per day of ROG, 357 pounds per day of NO_X, and 41 pounds per day of $PM_{2.5}$ could result in an estimate of 4.5 premature deaths per year or a 0.01-percent increase from background health incidences across the five-air-district region due to the increase in $PM_{2.5}$ from the proposed project, and 0.17 premature deaths per year or a 0.00056 percent increase from background health incidences across the five-air-district region due to an increase in ozone that could result from the proposed project's emissions of ozone precursors. These outcomes would be reduced with implementation of Mitigation Measures AQ-2a and AQ-2b, which would reduce the

project's construction-related emissions of criteria air pollutants below the SMAQMD's thresholds of significance. Daily emissions of ROG, NO_X, and $PM_{2.5}$ would be reduced to approximately 90, 246, and 30 pounds, respectively. As described previously, the modeling indicated that for projects with emissions at or below the maximum SMAQMD thresholds of significance levels for criteria air pollutants, the project on its own does not lead to significant health effects. In addition, the tool's outputs are based on the simulation of a full year of exposure at the maximum daily exposure, which is not a realistic scenario because construction emissions occurring over the 18-month construction duration would vary on a daily basis as equipment and vehicle requirements would increase and decrease with each phase and specific construction activity.

As discussed above, the nature of criteria pollutants is such that the emissions from an individual project cannot be directly identified as responsible for health impacts within any specific geographic location. As a result, attributing health risks at any specific geographic location to a single proposed project is not feasible. Nonetheless, the results of the Strategic Area Project Health Screening Tool have been presented to inform the public of the proposed project contribution to health risks. The modeling results support a conclusion that the proposed project construction does not, on its own, lead to significant regional health effects from the emissions of criteria air pollutants and precursors. Therefore, this impact is **less than significant**.

Mitigation Measures

AQ-3: Site Investigation for Potential Naturally Occurring Asbestos.

> A site investigation shall be performed to determine whether and where NOA is present in the soil and rock on the project site in areas that would be disturbed by the project and that are within "areas moderately likely to contain NOA," as determined by the map in California Geological Survey's report titled Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California and mapped in Plate AQ-1, above. The site investigation shall include the collection of soil and rock samples by a California Registered geologist as determined by the geologist and in coordination with the County. If the site investigation determines that NOA is not present on the project site, the project applicant shall submit a Geologic Exemption as allowed under Title 17, Section 93105, Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining (Asbestos ATCM). If the site investigation determines that NOA is present on the project site, the project applicant shall submit an Asbestos Dust Mitigation Plan that includes the control measures required by the Asbestos ATCM for review and approval by the District before beginning any ground disturbance activity. Upon approval of the Asbestos Dust Mitigation Plan by the District, the applicant shall ensure that construction contractors implement the terms of the plan throughout the construction period. The Asbestos Dust Mitigation Plan will also be a required component of the bonded decommissioning plan that the contractor shall implement throughout the decommissioning period.

Significance After Mitigation

Construction and Decommissioning

Although construction-related health risks would not exceed the SMAQMD thresholds of significance and mitigation to reduce health risks is not required, implementation of Mitigation Measure AQ-2b would be required to reduce the mass emissions of PM_{10}, and NO_X below criteria pollutant thresholds of significance, as described in Impact AQ-2. Implementation of this measure will also reduce emissions of DPM, which will further reduce the health risk impacts from construction activities. Table AQ-10 presents the construction health risk assessment results with implementation of Mitigation Measure AQ-2b for informational purposes.

Table AQ-10: Construction Health Risk Assessment Results - Mitigated

Impact Parameter	Units	Project Impact	SMAQMD Threshold
Maximum Individual Cancer Risk	per Million	0.1	10
Chronic Hazard Index	Index Value	0.0001	1.0

Notes: SMAQMD = Sacramento Metropolitan Air Quality Management District

Source: See Appendix AQ-1 for detailed HRA assumptions and results.

As shown in Table AQ-10, with implementation of mitigation measure AQ-2b, the construction health risk impacts would be further reduced and exposure of sensitive receptors to substantial pollutant concentrations would remain **less than significant**.

Implementation of Mitigation Measure AQ-3 would reduce impacts associated with generation of fugitive dust that potentially contains NOA. If the site investigation determines that NOA is present on the project site, then implementation of a District-approved dust mitigation plan would reduce impacts related to construction and decommissioning activities in serpentinite soils. Therefore, exposure to NOA during construction and decommissioning would be **less than significant with mitigation**.

Impact AQ-4: Result in Other Emissions (Such as Those Leading to Odors) Adversely Affecting a Substantial Number of People?

Sources that may emit odors during construction and decommissioning activities include exhaust from diesel construction equipment and heavy-duty trucks, which could be considered offensive to some individuals. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. The project would use typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Project operation would also not add any new sources of odors. The project would continue to utilize land for agricultural activities, which may consist of apiary facilities and/or grazing activities. As such, potential emissions, such as those leading to odors, from the agricultural activities, would remain similar to existing conditions. The land uses associated with the project are utility-related and would not include the typical odor-generating land uses, such composting facilities, wastewater

treatment plants, or rendering plats. As a result, the project would not result in other emissions, such as those leading to odors, affecting a substantial number of people. This impact would be **less than significant**.