4.2—AIR QUALITY

This section of the Draft EIR documents potential project impacts associated with air quality and air pollutant emissions. Impacts considered in this section include the potential for project air emissions to exceed established thresholds or to cause or contribute to exceedance of state or federal ambient air quality standards. The section also considers human health risks associated with air pollutant emissions resulting from the project and the potential for public nuisance as a result of project odors.

The information in this section is based on a peer review of applicant-prepared studies and publicly available sources. The applicant-prepared studies used are:

- *Air and Greenhouse Gas Emissions Study, Clayton Quarry Reclamation Plan Amendment* prepared by Compass Land Group (Appendix D-1, "Air and Greenhouse Gas Emissions Study")
- *Public Health Risk Assessment of Site Reclamation* (HRA) prepared by Compass Land Group (Appendix D-2, "Public Health Risk Assessment of Site Reclamation")

These analyses were peer reviewed by County-retained Rincon Consultants, Inc. in February and October of 2020. The peer review letter reports are on file with the County. The applicant revised the referenced air quality analysis; the revised report is located in Appendix D-1. The final *Air and Greenhouse Gas Emissions Study*, dated July 2020, adequately addressed the peer reviewer's comments and questions. The peer reviewer had no comments or questions on the HRA (see Appendix D-2).

4.2.1 Environmental Setting

Location and the amount of air pollutants in said locations are the primary factors that influence air quality; however, topography, climate, and meteorological conditions are also influential factors because they determine the movement and dispersal of air pollutants. California is divided into fifteen air basins, each with its own unique regional climate. The project site is located in the eastern Contra Costa County sub region of the San Francisco Bay Area Air Basin (SFBAAB).

The SFBAAB includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, the southern portion of Sonoma County, and the southwest portion of Solano County. The SFBAAB covers approximately 5,540 square miles of complex terrain consisting of coastal mountain ranges, inland valleys, and the San Francisco Bay. The SFBAAB is generally bounded on the west by the Pacific Ocean, on the north by the Coast Ranges, and on the east and south by the Diablo Range.

The climate within the SFBAAB is dominated by a strong, semi-permanent, subtropical high-pressure cell over the northeastern Pacific Ocean. Climate is also affected by the adjacent oceanic heat reservoir's moderating effects. Mild summers and winters, moderate rainfall and humidity, and daytime onshore breezes characterize regional climatic conditions in the San Francisco Bay Area (Bay Area). In summer, when the high-pressure cell is strongest and farthest north, fog forms in the morning and temperatures are mild. In winter, when the high-pressure cell is weakest and farthest south, occasional rainstorms occur.

4.2.1.1 Environmental Factors Affecting Air Quality

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

Temperature Inversions

Temperature inversion layers, also called thermal inversions, describe areas where the normal decrease in air temperature as altitude increases is reversed and air above the ground is warmer than the air closer to the ground. Inversion layers can be anywhere from under 100 feet to over thousands of feet thick. Thermal inversions limit the vertical dispersion of air pollutants, which can trap pollutants close to the ground. These inversions occur most often when a warmer, less dense air mass flows over a colder, more dense air mass close to the ground. The highest air pollutant concentrations in the Bay Area generally occur during these inversions, of which there are two types: 1) subsidence inversions, a regional phenomenon that is most common in the Bay Area during summer and fall, when descending warmer air from the subtropical high pressure cell centered over the Pacific Ocean caps the cooler marine air layer nearer the surface; and 2) radiation inversions, which are more localized and typical of winter nights in interior parts of the Bay Area where air in contact with the ground cools more rapidly than the air layer above it.

Topography and its Effect on Wind Speeds and Patterns

Low wind speed conditions limit horizontal air dispersion and can result in the buildup of air pollutants. Poor air quality under low wind speed conditions can be especially pronounced in interior valleys, where the topography also contributes to the restriction of air movement and pollutant dispersion.

Solar Radiation and its Impact on Photochemical Pollutants

The higher intensity and longer duration of solar radiation during the Bay Area's summer months provide ultraviolet light and warm temperatures that promote the formation of secondary photochemical pollutants (e.g., ozone). Sunlight intensity and summer temperatures are much higher in many of the Bay Area's inland valleys than near the coast, causing these inland areas to be especially prone to photochemical air pollution. In contrast, photochemical pollutants do not usually reach significant levels anywhere in the Bay Area during the winter, when temperatures are lower and daylight hours are shorter.

As a consequence of all these factors, the parts of the Bay Area having the highest air pollution potential tend to be the inland areas, which experience higher temperatures in the summer and lower temperatures in the winter. Furthermore, the inland areas are sheltered from the higher winds and more frequent fog episodes that affect the coastal areas. Also, air pollutant levels depend on the amount of pollutants emitted locally or from upwind sources, which cause higher ambient levels in inland areas because they are subject to emissions transported by the prevailing winds from populous upwind areas.

Local Topography, Meteorology, and Climate

Temperatures in and around the San Ramon and Diablo Valleys are warm in the summer and cool in the winter, largely because of their distance from the moderating effect of water bodies and because the California Coast Range blocks marine air flow into the valleys. The Carquinez Strait region remains temperate due to its proximity to water and oceanic air flows. In winter, average daily temperatures are mild, with tule fog common at night. Average summer temperatures are typically mild overnight and warm during the day, with cooler temperatures and stronger winds more common along the western coast. Wind speeds are generally low throughout the region and winds typically blow from northwest to southwest. However, strong afternoon gusts are common in the northern portion of the county around the Carquinez Strait. Annual rainfall averages between 18 and 23 inches across the county (BAAQMD 2019).

Clayton is located in the upper reaches of Clayton Valley. In general, valleys with surrounding ridges and mountains (also called box-end configurations) such as this have a greater susceptibility to poor air quality because they tend to trap air and have greater potential for temperature inversions. Since box-end configurations block winds, these areas lack the flushing action that winds give to coastal and estuarine areas (City of Clayton 2016). The topography within 2 miles of Clayton contains very significant variations in elevation, with a maximum elevation change of 1,309 feet and an average elevation above sea level of 655 feet. Within 10 miles of Clayton there are very significant variations in elevation (3,802 feet).

The air pollution potential of the project vicinity is mostly influenced by air quality in the adjacent Concord area. Concord is particularly susceptible to air pollution due to regional airflow patterns in conjunction with upwind emission sources. When southwesterly or northwesterly winds occur, pollutants from the South Bay/Livermore area or North Bay are carried into the Concord area. South-southwesterly winds predominate about 40 percent of the time while northwesterly winds occur 5 to 10 percent of the time. Pollutant concentrations can also increase further during relatively calm periods because of local emission sources. Calm conditions occur about 30 percent of the time (City of Clayton 2016).

The nearest meteorological station is in the City of Concord (Buchanan Field) approximately 6 miles west of the project site. Although the Concord area influences the larger airflow patterns in the Clayton Valley, the HRA determined that the meteorological station data from Buchanan Field would not be representative for use in its exposure assessment due to the complex terrain around the project site (e.g., rapidly changing topographic conditions over short distances associated with the quarry and Mt. Zion). Therefore, the 5th generation mesoscale (MM5) model developed by National Center for Atmospheric Research (NCAR) was used to generate site-specific meteorological data for the period January 1, 2015 to December 31, 2019. According to the data, winds are predominantly from the west-southwest with an average annual speed of 7.3 knots. Calm winds occur approximately 2 percent of the time (see Appendix D-2).

Ozone and fine particle pollution, or $PM_{2.5}$, are the major regional air pollutants of concern in the Bay Area. Ozone is primarily a problem in the summer, and fine particle pollution in the winter. Ozone and $PM_{2.5}$ infrequently exceed health standards in the portion of Contra Costa County west of the East Bay hills. The San Francisco Bay keeps air temperatures above freezing in winter and well below 100 degrees on even the warmest summer days. In eastern Contra Costa County, summer afternoon temperatures frequently approach triple digits, spurring ozone levels to exceed health standards. In winter, $PM_{2.5}$ can be transported westward through the Carquinez Strait from the Central Valley where it adds to wood smoke, causing health standards to be exceeded (BAAQMD 2019).

4.2.1.2 Pollutants and Health Effects

Air pollution contributes to a wide variety of adverse health effects. The United States Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for six of the most common air pollutants—carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen dioxide, and sulfur dioxide—known as "criteria" air pollutants. California Air Resources Board (CARB) also has adopted California ambient air quality standards (CAAQS) for these same criteria air pollutants. The presence of criteria pollutants in ambient air is generally caused by numerous, diverse, and widespread sources of emissions.

Ambient air quality standards are established to protect the public from adverse health effects of criteria pollutants and to provide protection against visibility impairment and damage to animals, crops, vegetation, or buildings. Health effects that have been associated with each of the criteria pollutants are summarized below.

Ozone

Ground-level ozone is a secondary pollutant that forms through the reaction of pollutants (e.g., oxides of nitrogen and reactive organic gases) in the atmosphere by a photochemical process involving sun energy. Chemicals that are precursors to ozone formation can also be emitted by natural sources, particularly trees and other plants. Ground-level ozone can pose risks to human health, in contrast to the stratospheric ozone layer that protects the earth from harmful wavelengths of solar ultraviolet radiation.

Short-term exposure to ground-level ozone can cause a variety of respiratory health effects, including inflammation of the lining of the lungs, reduced lung function, and respiratory symptoms such as cough, wheezing, chest pain, burning in the chest, and shortness of breath. Ozone exposure can decrease the capacity to perform exercise. Exposure to ozone can also increase susceptibility to respiratory infection. Exposure to ambient concentrations of ozone has been associated with the aggravation of respiratory illnesses such as asthma, emphysema, and bronchitis, leading to increased use of medication, absences from school, doctor and emergency department visits, and hospital admissions. Short-term exposure to ozone is associated with premature mortality. Studies have also found that long-term ozone exposure may contribute to the development of asthma, especially among children with certain genetic susceptibilities and children who frequently exercise outdoors. Long-term exposure to ozone can permanently damage lung tissue (EPA 2013).

Other health effects of ozone include:

- difficulty to breathe deeply and vigorously,
- shortness of breath and pain when taking a deep breath,
- coughing and sore or scratchy throat,
- inflammation and damage to the airways,
- aggravation of lung diseases such as asthma, emphysema, and chronic bronchitis,
- increased frequency of asthma attacks,
- increased susceptibility of the lungs to infection, and
- continued damage to the lungs even when the symptoms have disappeared (EPA 2021).

Nitrogen Oxides

Nitrogen oxides (NO_x) are a group of gases that form when nitrogen reacts with oxygen during combustion, especially at high temperatures. These compounds (including nitric oxide and nitrogen dioxide), can contribute significantly to air pollution, especially in cities and areas with high motor vehicle traffic.

In the Bay Area, nitrogen dioxide appears as a brown haze. At higher concentrations, nitrogen dioxide can damage sensitive crops, such as beans and tomatoes, and aggravate respiratory problems. The U.S. EPA, CARB, and BAAQMD have all adopted measures to reduce emissions of nitrogen oxides. BAAQMD places restrictions on pollutant sources such as power plants, boilers, stationary turbines, and stationary engines, and addresses motor vehicle sources by working to change people’s driving habits (BAAQMD 2014).

Particulate Matter

Particulate matter (PM) is a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles (liquid droplets or solids) over a wide range of sizes. Particles originate from a variety of man-made stationary and mobile sources, as well as from natural sources like forest fires and salts from the ocean. The chemical and physical properties of PM vary greatly with time, region, meteorology, and the source of emissions.

For regulatory purposes, EPA distinguishes between categories of particles based on size and has established standards for fine and coarse particles. PM_{10}, in general terms, is an abbreviation for particles with an aerodynamic diameter less than or equal to 10 micrometers (μm), and it represents inhalable particles small enough to penetrate deeply into the lungs (i.e., thoracic particles). PM_{10} is composed of a coarse fraction referred to as $PM_{10-2.5}$ or as thoracic coarse particles (i.e., particles with an aerodynamic diameter less than or equal to 10 μm and greater than 2.5 μm) and a fine fraction referred to as $PM_{2.5}$ or fine particles (i.e., particles with an aerodynamic diameter less than or equal to 2.5 μm). Thoracic coarse particles are emitted largely as a result of mechanical processes and uncontrolled burning. Important sources include resuspended dust (e.g., from cars, wind, etc.), industrial processes, construction and demolition operations, residential burning, and wildfires. Fine particles are formed chiefly by combustion processes (e.g., from power plants, gas and diesel engines, wood combustion, and many industrial processes) and by atmospheric reactions of gaseous pollutants (EPA 2013).

Although scientific evidence links harmful human health effects from exposures to both fine particles and thoracic coarse particles, the evidence is much stronger for fine particles than for thoracic coarse particles. Effects associated with exposures to both $PM_{2.5}$ and $PM_{10-2.5}$ include premature mortality, aggravation of respiratory and cardiovascular disease (as indicated by increased hospital and emergency department visits), and changes in sub-clinical indicators of respiratory and cardiac function. Such health effects have been associated with short- and/or long-term exposure to PM. Exposures to $PM_{2.5}$ are also associated with decreased lung function growth, exacerbation of allergic symptoms, and increased respiratory symptoms. Children, older adults, individuals with preexisting heart and lung disease (including asthma), and persons with lower socioeconomic status are among the groups most at risk for effects associated with PM exposures. Information is accumulating and currently provides suggestive evidence for associations between long-term $PM_{2.5}$ exposure and developmental effects, such as low birth weight and infant mortality resulting from respiratory causes (EPA 2013).

Lead

Historically, the primary source of lead emissions to the air was combustion of leaded gasoline in motor vehicles (such as cars and trucks), prior to the eradication of leaded gasoline in the United States in the mid-1990s. Since then, the remaining sources of lead air emissions have been industrial sources, including lead smelting operations, battery recycling operations, and piston-engine small aircraft that use leaded aviation gasoline. Lead accumulates in bones, blood, and soft tissues of the body. Exposure to lead can affect development of the central nervous system in young children, resulting in neurodevelopmental effects such as lowered intelligence and behavioral problems (EPA 2013).

Carbon Monoxide

Gasoline-fueled vehicles and other on-road and non-road mobile sources are the primary sources of carbon monoxide (CO) in the United States. Exposure to carbon monoxide reduces the capacity of the blood to carry oxygen, thereby decreasing the supply of oxygen to tissues and organs. Reduction in oxygen supply to the heart, in particular, causes critical complications. People with any heart disease already have a reduced capacity for pumping oxygenated blood to the heart, which can cause them to experience myocardial ischemia (reduced oxygen to the heart), often accompanied by chest pain (angina), when exercising or under increased stress. For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion. Therefore, people with angina or heart disease are at the greatest risk from ambient CO. Other potentially at-risk populations include those with chronic obstructive pulmonary disease, anemia, diabetes, and those in prenatal or elderly life stages (EPA 2013).

4.2.1.3 Toxic Air Contaminants

Toxic air contaminants (TACs) are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A wide range of sources, from industrial plants to motor vehicles, emit TACs. TACs can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. This section and the *Air and Greenhouse Gas Emissions Study* (see Appendix D-1) focus on direct TAC emissions that would be associated with project reclamation activities, not those formed in the atmosphere.

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 effects, such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches. For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Non-carcinogenic substances differ in they are generally assumed to feature a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure levels.

TACs are primarily regulated through state and local risk management programs. These programs are designed to eliminate, avoid, or minimize the risk of adverse health effects from exposures to TACs. A chemical becomes a regulated TAC in California based on designation by the Office of Environmental Health Hazard Assessment (OEHHA). As part of its jurisdiction under Air Toxics Hot Spots Program (Health and Safety Code Section 44360(b)(2)), OEHHA derives cancer potencies and reference exposure levels (RELs) for individual air contaminants based on the current scientific knowledge that includes consideration of possible differential effects on the health of infants, children and other sensitive subpopulations, in accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia, Chapter 731, Statutes of 1999, Health and Safety Code Sections 39669.5 et seq.).

Regional Air Quality and Attainment Status

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to the CAAQS and NAAQS. Both CARB and USEPA use monitoring station data to designate an area's attainment status with respect to the CAAQS and NAAQS, respectively, for criteria air pollutants. The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." The "unclassified" designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. See Table 4.2-1, "Ambient Air Quality Standards," below.

TABLE 4.2-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards[1]	National Standards[2]	
		Concentration[3]	*Primary[3,4]*	*Secondary[3,5]*
O_3	1 hour	0.09 ppm (180 µg/m^3)	—	Same as Primary Standard
	8 hours	0.070 ppm (137 µg/m^3)	0.070 ppm (147 µg/m^3)	
NO_2	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1 hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	
CO	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
SO_2	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas)	—
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas)	—
	3 hours	—	—	0.5 ppm (1300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3	—
PM_{10}	24 hours	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m^3	—	
$PM_{2.5}$	24 hours	No Separate State Standard	35 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
Lead[6]	30-day Average	1.5 µg/m^3	—	—
	Calendar Quarter	—	1.5 µg/m^3	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 µg/m^3	
Hydrogen sulfide	1 hour	0.03 ppm	—	—
Vinyl chloride	24 hours	0.01 ppm	—	—
Sulfates	24 hours	25 µg/m^3	—	—
Visibility-reducing particles	8 hours (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer because of particles when the relative humidity is less than 70 percent	—	—

Pollutant	Average Time	California Standards[1]	National Standards[2]	
		Concentration[3]	*Primary[3,4]*	*Secondary[3,5]*

Source: CARB 2016.

Acronyms: CO=carbon monoxide; µg/m³ = micrograms per cubic meter; mg/m³= milligrams per cubic meter; NO_2=nitrogen dioxide; O_3=ozone, ppm = parts per million by volume; SO_2=sulfur dioxide, PM_{10} and $PM_{2.5}$= suspended particulate matter.

Notes:

1. California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For NO_2 and SO_2, the standard is attained when the 3-year average of the 98th and 99th percentile, respectively, of the daily maximum 1-hour average at each monitor within an area does not exceed the standard (effective April 12, 2010). For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 micrograms per cubic meter (µg/m³) 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 on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr.
   Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm (parts per million) in this table refers to ppm by volume, or micromoles 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. CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

With respect to the CAAQS, the SFBAAB is currently designated as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, and as an attainment or unclassified area for all other pollutants. With respect to the NAAQS, the SFBAAB is designated as a marginal nonattainment area for ozone, as a nonattainment area for $PM_{2.5}$, and as an attainment or unclassified area for all other pollutants.

Criteria Air Pollutant Monitoring Station Data

Several ambient air quality monitoring stations are located in SFBAAB to monitor progress toward air quality standards attainment of NAAQS and CAAQS. The monitoring station closest to the project area, the Concord (Treat Blvd.) air monitoring station (ID 06-013-0002), is located at approximate GPS coordinates 37.936013, -122.026154 and at the intersection of Oak Grove Road and Treat Boulevard. Recent air quality monitoring results from the Concord station are summarized in the *Air and Greenhouse Gas Emissions Study* (see Appendix D-1).

4.2.2 Regulatory Setting

Federal, state, and local regulations pertaining to air quality potentially applicable to the project are discussed below.

4.2.2.1 Federal

U.S. Environmental Protection Agency

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. EPA is responsible for implementing most aspects of the Clean Air Act, which include NAAQS for major air pollutants, performance standards for new and modified sources, hazardous air pollutant standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions. NAAQS are established for "criteria pollutants" under the Clean Air Act, which are O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires EPA to reassess NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames. NAAQS are presented in Table 4.2-1.

4.2.2.2 State

California Air Resources Board

The Clean Air Act delegates the regulation of air pollution control and the enforcement of NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to the CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB is responsible for ensuring implementation of the California Clean Air Act (CCAA) and the federal Clean Air Act and regulating emissions from motor vehicles, mobile equipment, and consumer products. CARB also sets health-based air quality standards and control measures for TACs. CARB has established CAAQS, which are generally more restrictive than NAAQS. CAAQS describe adverse conditions for certain emissions (i.e. pollution levels must be below these standards before a basin can attain the standard). CAAQS for O_3, CO, SO_2 (1 hour and 24 hours), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. NAAQS and CAAQS are presented in Table 4.2-1.

Idling of Commercial Heavy Duty Trucks

In January 2005, CARB adopted an Airborne Toxic Control Measure (ATCM) to control emissions from idling trucks. The ATCM, which became effective February 1, 2005, prohibits idling for more than 5 minutes for all diesel-fueled commercial motor vehicles with a gross vehicular weight ratings over 10,000 pounds that are or must be licensed for operation on highways. The ATCM contains several exceptions that allow trucks to idle during the following periods:

(1) a bus is idling for
   (A) up to 10.0 minutes prior to passenger boarding, or
   (B) when passengers are onboard;

(2) idling of the primary diesel engine is necessary to power a heater, air conditioner, or any ancillary equipment during sleeping or resting in a sleeper berth. This provision does not apply when operating within 100 feet of a restricted area;

(3) idling when the vehicle must remain motionless due to traffic conditions, an official traffic control device, or an official traffic control signal over which the driver has no control, or at the direction of a peace officer, or operating a diesel-fueled APS at the direction of a peace officer;

(4) idling when the vehicle is queuing that at all times is beyond 100 feet from any restricted area;

(5) idling of the primary engine or operating a diesel-fueled APS when forced to remain motionless due to immediate adverse weather conditions affecting the safe operation of the vehicle or due to mechanical difficulties over which the driver has no control;

(6) idling to verify that the vehicle is in safe operating condition as required by law and that all equipment is in good working order, either as part of a daily vehicle inspection or as otherwise needed, provided that such engine idling is mandatory for such verification;

(7) idling of the primary engine or operating a diesel-fueled APS is mandatory for testing, servicing, repairing, or diagnostic purposes;

(8) idling when positioning or providing a power source for equipment or operations, other than transporting passengers or propulsion, which involve a power take off or equivalent mechanism and is powered by the primary engine for:

  (A) controlling cargo temperature, operating a lift, crane, pump, drill, hoist, mixer (such as a ready mix concrete truck), or other auxiliary equipment;

  (B) providing mechanical extension to perform work functions for which the vehicle was designed and where substitute alternate means to idling are not reasonably available; or

  (C) collection of solid waste or recyclable material by an entity authorized by contract, license, or permit by a school or local government;

(9) idling of the primary engine or operating a diesel-fueled APS when operating defrosters, heaters, air conditioners, or other equipment solely to prevent a safety or health emergency;

(10) idling of the primary engine or operating a diesel-fueled APS by authorized emergency vehicles while in the course of providing services for which the vehicle is designed;

While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling (CARB 2020).

In-Use Off-Road Diesel-Fueled Fleets

On July 26, 2007, CARB adopted the Regulation for In-Use Off-Road Diesel-Fueled Fleets (Off-Road Diesel Regulation) to reduce PM and NO_x emissions from existing off-road heavy-duty diesel vehicles in California. This regulation required that specific fleet average requirements are met for NO_x emissions and for PM emissions. Where average requirements cannot be met, Best Available Control Technology (BACT) requirements apply. All self-propelled off-road diesel vehicles 25 horsepower (hp) or greater used in California and most two-engine vehicles (except on-road two-engine sweepers) are subject to the Off-Road Diesel Regulation. This includes vehicles that are rented or leased (rental or leased fleets).

The Off-Road Diesel Regulation:

- requires all vehicles be reported to CARB and labeled,
- restricts the adding of older vehicles into fleets starting on January 1, 2014,
- requires fleet owners to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (VDECS) i.e., exhaust retrofits,
- imposes limits on idling and requires a written idling policy, and

- requires a disclosure when selling vehicles.

All fleets must meet emission performance and reporting requirements by January 1, 2028. Annual reporting requirements, including the Responsible Official Affirmation of Reporting (ROAR) form, must be completed by March 1, 2028. Large fleets must report annually from 2012 to 2023, medium fleets from 2016 to 2023, and small fleets from 2018 to 2028. For each annual reporting date, a fleet must report any changes to the fleet, hour meter readings (for low-use vehicles and vehicles used a majority of the time, but not solely, for agricultural operations), and also must submit the ROAR form. Following January 1, 2023, small fleets may no longer add a vehicle with a Tier 2 engine to its fleet. The engine tier must be Tier 3 or higher. Medium and large fleets may not add tier 2 engines as of January 1, 2018. The goal of the In-Use Off-Road Diesel-Fueled Fleets Regulation is to reduce PM and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California (CARB 2020).

Truck and Bus Regulation

The Truck and Bus regulation affects individuals, private companies, and Federal agencies that own diesel vehicles with a Gross Vehicle Weight Rating (GVWR) greater than 14,000 pounds that operate in California. The regulation also applies to publicly and privately owned school buses; however, their compliance requirements are different, and reporting is not required. The regulation does not apply to state and local government vehicles and public transit buses because they are already subject to other regulations. Vehicles that are exempt from other heavy duty diesel regulations, such as Cargo Handling Equipment, Drayage Truck, and Solid Waste Collection Vehicle regulations, may be subject to the Truck and Bus Regulation (regulation). Drayage and solid waste collection trucks with 2007 to 2009 model year engines must meet the requirements of the regulation by January 1, 2023.

Heavier trucks and buses with a GVWR greater than 26,000 pounds must comply with a schedule by engine model year or owners can report to show compliance with more flexible options. All heavier vehicles with 1996 or newer model year engines should have a PM filter. By January 1, 2023, all trucks and buses must have 2010 model year or later engines with few exceptions.

Lighter trucks and buses with a GVWR of 14,001 to 26,000 pounds have replacement requirements starting January 1, 2015. Starting January 1, 2015, lighter vehicles with engines that are 20 years or older must be replaced with newer trucks (or engines). Starting January 1, 2020, all remaining vehicles need to be replaced so that they all have 2010 model year engines or equivalent emissions by January 1, 2023 (CARB 2020).

Assembly Bill 1807 and Assembly Bill 2588

Assembly Bill 1807 (AB 1807) was enacted in 1983 and established a two-step process of risk identification and risk management to address the potential health effects from air toxic substances and protect the public health of Californians. During the first step (identification), CARB and OEHHA determined if a substance should be formally identified as a TAC in California. In the second step (risk management), CARB reviewed the emission sources of an identified TAC to determine if any regulatory action is necessary to reduce the risk. The analysis included a review of controls already in place, the available technologies and associated costs for reducing emissions, and the associated risk. The AB 1807 program was amended in 1993 as AB 2728, which required CARB to identify the 189 federal hazardous air pollutants as TACs and develop health effects values for newly identified TACs.

The Air Toxics "Hot Spots" Information and Assessment Act, or Assembly Bill 2588 (AB 2588), was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

4.2.2.3 Local

Contra Costa County General Plan

The *Contra Costa County General Plan* Conservation Element contains air quality goals and policies to address air pollution in the county. General Plan air quality goals and policies applicable to the project include the following:

Conservation Element

Goal 8-AA: To meet Federal Air Quality Standards for all air pollutants.

Goal 8-AB: To continue to support Federal, State and regional efforts to reduce air pollution in order to protect human and environmental health.

Goal 8-AC: To restore air quality in the area to a more healthful level.

Policy 8-103: When there is a finding that a proposed project might significantly affect air quality, appropriate mitigation measures shall be imposed.

Policy 8-104: Proposed projects shall be reviewed for their potential to generate hazardous air pollutants.

Bay Area Air Quality Management District

BAAQMD has local air quality jurisdiction over projects in Contra Costa County. BAAQMD's responsibilities include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA. BAAQMD is also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and ensuring that the NAAQS and CAAQS are met.

Under the CCAA, BAAQMD is required to develop an air quality plan for nonattainment criteria pollutants in the air district. The *2001 San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard* was prepared to address ROG and NOx emissions following the region's nonattainment designation for the 1-hour ozone NAAQS. The Bay Area 2017 Clean Air Plan, adopted by BAAQMD on April 19, 2017, provides an integrated control strategy to reduce ozone, PM, TACs, and greenhouse gas (GHG) emissions in a manner that is consistent with federal and state air quality programs and regulations. The 2017 Clean Air Plan updates the previous Bay Area ozone plan and the 2010 Clean Air Plan, to include strategies to reduce emissions of ozone precursors, particulate matter, and TAC emissions pursuant to air quality planning requirements defined in the California Health & Safety Code. BAAQMD also adopted a redesignation plan for CO in 1994. The redesignation plan includes strategies to ensure the continuing attainment of NAAQS for CO in SFBAAB.

In support of Assembly Bill 617 (AB 617: Community Health Protection Program), BAAQMD established the Community Air Risk Evaluation (CARE) Program to reduce health risks linked to local air quality. The CARE Program identifies areas with elevated pollution burden and vulnerable populations, develops air quality programs to minimize these burdens, and unites government, businesses, and communities to develop and implement additional actions. The CARE program served as a starting point for the Air District's Community Health Protection Program.

BAAQMD's CEQA Guidelines document provides guidance to assist lead agencies in determining the level of significance of project-related emissions, and contain thresholds of significance for O_3, CO, PM_{10}-, $PM_{2.5}$, TACs, and odors. According to BAAQMD's CEQA Guidelines, project emissions that exceed the recommended threshold levels are considered potentially significant and should be mitigated where feasible. Although BAAQMD's CEQA Guidelines are intended to help lead agencies navigate through the CEQA process, BAAQMD indicates that the guidelines for implementation of its significance thresholds are advisory only and should be followed by local governments at their own discretion.

4.2.3 Significance Thresholds and Analysis Methodology

4.2.3.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed project would have a significant impact on air quality if it would:

a) conflict with or obstruct implementation of the applicable air quality plan;

b) 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;

c) expose sensitive receptors to substantial pollutant concentrations; or

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

The BAAQMD significance thresholds contained within the district's *California Environmental Quality Act Air Quality Guidelines* (May 2017 Revision) (BAAQMD CEQA Guidelines) are shown in Table 4.2-2, "BAAQMD Project Level Thresholds of Significance," below.

TABLE 4.2-2
BAAQMD PROJECT LEVEL THRESHOLDS OF SIGNIFICANCE[1]

Pollutant ***(Criteria Air Pollutants and Precursors (Regional)***	**Construction-Related** ***(Average Daily Emissions [lb/day])***	**Operational-Related**	
		Average Daily Emissions (lb/day)	***Maximum Annual Emissions (tpy)***
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
$PM_{10}/PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
Local CO	None	9.0 ppm (8-hour average), 20.00 ppm (1-hour average)	
GHGs – Projects other than Stationary Sources	None[2]	Compliance with Qualified GHG Reduction Strategy OR 1,100 MT of CO_2e/yr OR 4.6 MT CO_2e/SP/yr (residents + employees)	
GHGs – Stationary Sources	None[2]	10,000 MT/yr	
Odors	None	5 confirmed complaints per year averaged over three years	

Pollutant (Criteria Air Pollutants and Precursors (Regional)	Construction-Related (Average Daily Emissions [lb/day])	Operational-Related	
		Average Daily Emissions (lb/day)	Maximum Annual Emissions (tpy)

Source: BAAQMD 2017b.

Notes:

1. Project level thresholds of significance adapted from Tables 2-1 and 2-2 of the BAAQMD CEQA Guidelines (BAAQMD 2017b).
2. BAAQMD does not have an adopted threshold for construction-related GHG emissions. However, the Lead Agency should quantify and disclose GHG emissions that would occur during construction, and make a determination on the significance of these construction-generated GHG emission impacts in relation to meeting AB 32 GHG reduction goals, as required by the Public Resources Code, Section 21082.2. The Lead Agency is encouraged to incorporate best management practices to reduce GHG emissions during construction, as feasible and applicable. (BAAQMD 2017b: 2-6).
3. Definitions: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; GHGs = greenhouse gases; lb/day = pounds per day; MT = metric tons; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ppm = parts per million; SP = service population; tpy = tons per year; yr = year; TBD = to be determined.

The issues identified above are considered in the air quality impact analysis presented in Section 4.2.4, "Project Impacts and Mitigation Measures." Issues related to greenhouse gas are presented in Section 4.5, "Greenhouse Gas Emissions."

In addition, the BAAQMD CEQA Guidelines inform the lead and responsible agencies of the extent of airborne emissions from stationary sources and the potential public health impacts associated with such emissions. To assist lead agencies in evaluating air quality impacts at the neighborhood scale, BAAQMD recommends thresholds of significance for local community risks and hazards associated with TACs and $PM_{2.5}$ with respect to siting a new source and/or receptor; as well as for assessing both individual source and cumulative multiple source impacts. Local community risk and hazard impacts are associated with TACs and $PM_{2.5}$ because emissions of these pollutants can have significant health impacts at the local level. If emissions of TACs or $PM_{2.5}$ exceed any of the thresholds of significance listed below, a proposed project would result in a significant impact:

1. Non-compliance with a qualified risk reduction plan; or
2. An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 would be a cumulatively considerable contribution; or
3. An incremental increase of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ would be a cumulatively considerable contribution.

A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius from the fence line of a source plus the contribution from the project, exceeds the following:

1. Non-compliance with a qualified risk reduction plan; or
2. An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0; or
3. 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

These thresholds for local risks and hazards associated with TACs and $PM_{2.5}$ are intended to apply to both permitted stationary sources and on- and off-road mobile sources, such as sources related to construction, busy roadways, or freight movement. While the project does not introduce a new stationary source, the modeled project health risks involve on- and off-road mobile sources that can be compared to the BAAQMD thresholds for purposes of CEQA analysis. Cumulative impacts are addressed in Chapter 5, "Cumulative Impacts."

4.2.3.2 Analysis Methodology

The following sections discuss the methods for evaluating emissions of criteria air pollutants and potential ambient air quality and health impacts associated with project emissions.

This analysis, presented in Section 4.2.4, "Project Impacts and Mitigation Measures," the *Air and Greenhouse Gas Emissions Study* and the HRA (see Appendix D), evaluates the potential air quality and health risk impacts the proposed project and present emissions information related to existing operations at the project site for informational purposes. Project reclamation emissions are compared against significance thresholds adopted by BAAQMD. Emissions from existing operations (i.e., mining and processing activities that are outside the scope of the Project) are presented for evaluation of cumulative impacts only, which are analyzed in Chapter 5.

Criteria Pollutant Emissions

The CEQA baseline used for purposes of this analysis is existing conditions; however, no current reclamation activity exists for which baseline emissions would be evaluated or measured. Reclamation activity would occur over an anticipated period of 47 years, ending in 2068.

For proposed project reclamation activities, the air consultant primarily used the California Emissions Estimator Model (CalEEMod) to quantify emissions in the *Air and Greenhouse Gas Emissions Study*. Project reclamation activities are modeled as independent phases in CalEEMod for each of the overburden fill, quarry pit, off-site drainage improvement, and processing plant areas. For modeling purposes, certain end-of-life Project reclamation activities are assumed to be constructed in year 2049 (ahead of CEMEX's anticipated final reclamation date of 2068). This is to ensure proper CalEEMod model functionality, which requires that the Project build-out year be set to at least one year after the final year of construction. The final build-out year option in CalEEMod is year 2050; therefore, end-of-life activities are all modeled in construction year 2049 (one year sooner). Since CalEEMod's emissions factors do not extend beyond 2045 and should continue to improve over time, this results in a conservative estimate of emissions for the reclamation activities that are anticipated to occur in 2068. This has no effect on the significance conclusions presented in the analysis.

Using the outputs of the CalEEMod model runs, the highest pollutant-generating years for each pollutant are selected for reporting of emissions and comparison of the project's emissions to BAAQMD's thresholds of significance (see Table 4.2-2).

For evaluation of local CO emissions, BAAQMD's preliminary screening methodology was applied, which provides a conservative indication of whether the implementation of the proposed project would result in CO emissions that exceed the applicable thresholds of significance described in Table 4.2-2. BAAQMD does not publish a threshold of significance for construction-related CO. Construction activities are not usually a significant source of CO as most construction equipment are diesel-powered and produces much lower CO emissions than gasoline combustion engines. Compass Land Group also presents data from a nearby air monitoring station to show that the project's CO contribution from reclamation activity would be de-minimis compared to CO concentrations at Treat Boulevard in Concord (nearby), which are still well below the NAAQS and CAAQS.

Health Risk

Exposure to equipment exhaust and fugitive dust can lead to various health impacts. Specifically, the following three types of public health impacts are commonly associated with exposure to trace metals in dust and diesel particulate matter:

1. Cancer risk (reported as a probability)
2. Acute non-cancer risk (reported as a hazard index)
3. Chronic non-cancer risk (reported as a hazard index)

The preparation of health risk assessments is a multi-step process. The first step is to identify potential contaminants that may contribute to public health risks. The second step is to assess the amount of contaminants that may reach the public (exposure assessment). The third step is to calculate the magnitude of the health risk as a result of exposure to harmful contaminants on the basis of the toxicology of the contaminants.

For evaluation of health risk from exposure to TACs, the air consultant translated the emission rate of individual TACs (presented in Appendix D-2) into a concentration of each TAC. The key step in performing an exposure assessment is the application of an air dispersion model. The dispersion model incorporates the local meteorological data (wind speed, wind direction, local temperature, inversion heights, etc.), stack height, and exhaust flow characteristics into the concentration of individual air contaminant. Dispersion modeling was performed using the AERMOD Modeling System version 19121. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD, like most dispersion models, uses mathematical formulations to characterize the atmospheric processes that disperse pollutants emitted by a source. Using source emission rates, exhaust parameters, terrain characteristics, and meteorological inputs, AERMOD calculates down-wind pollutant concentrations at specified receptor locations.

To calculate the magnitude of the health risk from these pollutant concentrations, the consultant applied the Hotspots Analysis and Reporting Program Air Dispersion Modeling and Risk Assessment Tool Version 2 (HARP2 risk model) developed by CARB using the OEHHA derived calculation method. Residential cancer risk is based on a 30-year exposure and worker cancer risk is based on a 25-year exposure consistent with BAAQMD and OEHHA guidelines.

HARP 2 can be used by districts, facility operators, and other parties to manage and evaluate emissions inventory data and the potential health impacts associated with these emissions (CARB 2015).

Odor

For consideration of odors, BAAQMD presents screening distances for a variety of land uses that typically generate odors, such as landfills, composting facilities, rendering plants, and asphalt concrete batch plants. Since the proposed project does not propose or fall under any of the land use categories for which screening distances are provided, the air consultant instead obtained compliance history from BAAQMD for the existing processing facility located on the project site to show that this permitted use (even though it is not part of the proposed project) has not resulted in a significant number of odor complaints as compared to BAAQMD thresholds of significance that are discussed in Table 4.2-2. Detailed estimating methods and assumptions are provided in the *Air and Greenhouse Gas Emissions Study*'s appendices (see Appendix D-1).

4.2.4 Project Impacts and Mitigation Measures

Impact 4.2-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan

The BAAQMD's 2017 Clean Air Plan is the applicable air quality plan for the project and the County. Consistency with the air quality plan is determined by whether the project would hinder implementation of control measures identified in the air quality plan or result in growth of population or employment that is not accounted for in local and regional planning.

The project would not result in population growth in the County, as the number of employees for the proposed project would not substantially increase compared to existing conditions and, therefore, would represent an inconsequential growth in County employment and not exceed the employment growth accounted for in the *Contra Costa County General Plan*.

The Clean Air Plan contains control measures that identify actions to be taken by the air district, local government agencies, and private enterprises to reduce stationary and mobile sources of criteria pollutants and ozone precursors and TAC emissions in the SFBAAB (BAAQMD 2017a). As discussed under Impact 4.2-2 below, model years are below the applicable thresholds for all criteria pollutants. Therefore, project emissions would not hinder the air district in its goals for reducing significant air pollutants in the air basin, resulting in a less than significant impact on consistency with the Clean Air Plan.

Level of Significance: Less than significant.

Mitigation Measures: None required.

Impact 4.2-2: 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

Project operations associated with reclamation would emit criteria air pollutants, including ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$ from construction equipment and from mobile equipment and motor vehicles associated with excavation, grading/fill, revegetation, removal of mining equipment and facilities, and construction of drainage facilities.

Table 4.2-3, "Daily Criteria Air Pollutants and Precursor Emissions Analysis (lb/day)," presents the daily criteria air pollutants and ozone precursor emissions analysis. Table 4.2-4, "Annual Criteria Air Pollutants and Precursor Emissions Analysis (tons/year)," presents the annual criteria air pollutants and ozone precursor emissions analysis. A complete report of project emissions is included in the *Air and Greenhouse Gas Emissions Study*'s (see Appendix D-1) Appendix A, "Proposed Project Models and Inputs."

Table 4.2-3
Daily Criteria Air Pollutants and Precursor Emissions Analysis (lb/day)

Emissions Category	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
2022 Project Emissions	3.8	38.0	1.5	1.4
2025 Project Emissions	2.6	19.0	0.7	0.6
2068 Project Emissions	4.6	12.9	0.4	0.4

Emissions Category	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
Highest Year Project Emissions	**4.6**	**38.0**	**1.5**	**1.4**
BAAQMD CEQA Significance Thresholds	54	54	82	54
Exceeds Threshold (Yes/No)?	**No**	**No**	**No**	**No**

Source: Appendix D-1.

Notes:

1. BAAQMD thresholds from Table 4.2-2, above.
2. Project emissions are reported for model year 2022, which is the highest emitting model year for the reported pollutants. See Appendix A-1 of the study (see Appendix D-1) for detail.
3. The Applicant would be required to implement BAAQMD's best management practices for construction-related fugitive dust emission controls.

TABLE 4.2-4
ANNUAL CRITERIA AIR POLLUTANTS AND PRECURSOR EMISSIONS ANALYSIS (TONS/YEAR)

Emissions Category	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
2022 Project Emissions	0.1	0.13	$5.4x10^{-3}$	$5.0x10^{-3}$
2025 Project Emissions	0.05	0.39	0.01	0.01
2068 Project Emissions	0.2	0.52	0.01	0.01
Highest Year Project Emissions	**0.2**	**0.52**	**0.01**	**0.01**
BAAQMD CEQA Significance Thresholds	10	10	15	10
Exceeds Threshold (Yes/No)?	**No**	**No**	**No**	**No**

Source: Appendix D-1.

Notes:

1. BAAQMD thresholds from Table 4.2-2, above. Operational-related annual thresholds are used since there are no published construction-related annual thresholds.
2. Project emissions are reported for model year 2022, which is the highest emitting model year for the reported pollutants. See Appendix A-1 of the study (see Appendix D-1) for detail.
3. The Applicant would be required to implement BAAQMD's best management practices for construction-related fugitive dust emission controls.

Based on the results presented in Tables 4.2-3 and 4.2-4, above, all project criteria pollutant emissions are below applicable BAAQMD thresholds of significance for CEQA (BAAQMD 2017b). Therefore, the Project's potential criteria air pollutant impacts would be less-than-significant.

Level of Significance: Less than significant.

Mitigation Measures: None required.

Impact 4.2-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

Health Risk

In the HRA (see Appendix D-2), the emission rates discussed in Impact 4.2-2, above, were used as a basis to calculate emissions concentrations using dispersion modeling and then quantify health risks from public exposure to TACs. The HARP2 risk model developed by CARB and OEHHA was used to calculate the health risks.

The project's incremental maximum cancer risk at nearby homes is estimated to be 0.39 cancers per million. The risk varies from approximately less than 0.4 to less than 0.1 excess cancers per million depending on the exposure scenario (residential or sensitive receptor) and location. Cancer risk at nearby businesses is estimated to be 0.01 cancers per million. These results are presented in terms of a probability (cancers risk per million). These values are all well below the applicable thresholds of significance.

The highest residential risk levels are parallel to and on the east side of Mitchell Canyon Road, immediately east of the Project area. The highest residential risk level is identified at a residence located at the southwest side of the cul-de-sac at the south end of Widmar Place. Risk at nearby schools, day care centers, and medical centers are estimated to be 0.06 or less cancers per million. The highest worker risk occurs at the Mitchell Canyon Visitor Center within the Mount Diablo State Park at the south end of Mitchell Canyon Road.

The maximum non-cancer risks at nearby homes and businesses are calculated in terms of a hazard index (HI). The highest acute hazard index values of 0.3 occurs east of Mitchell Canyon Road, south of Diablo Downs Drive, and west of Tally Ho Court. Chronic hazard index was at or below 0.005 at all off-site receptors and as a result a meaningful contour map could not be generated.

The project's incremental annual average $PM_{2.5}$ concentration is 0.11 micrograms per cubic meter ($\mu g/m^3$), which is less than the applicable threshold of greater than 0.3 $\mu g/m^3$ (see Appendix D-2). Therefore, impacts from $PM_{2.5}$ to public health risk would be less than significant.

The results of the health risk analysis are summarized in Table 4.2-5, "Summary of Project Health Risks," below. For additional detail, refer to Appendix D-2.

TABLE 4.2-5
SUMMARY OF PROJECT HEALTH RISKS

Risk Metric	Maximum Off-Site Value	Significance Threshold	Significant?
Residential Cancer Risk per Million (30-year exposure)	0.39	10	No
Worker Cancer Risk (25-year exposure)	0.01 at Mitchell Canyon Visitor Center	10	No
Cancer Risk per Million at Sensitive Receptors (schools, hospitals)	0.028 at Mt. Diablo Elementary School 0.022 at Pine Hollow Middle School 0.064 at Clayton's Children Center 0.028 at Clayton Community School 0.022 at Sho Day Care 0.006 at John Muir Medical Center	10	No
Chronic Hazard Index	Residential 0.005 Worker 0.002	1.0	No
Acute Hazard Index	Residential 0.34 Worker 0.235	1.0	No
Annual $PM_{2.5}$	0.11 ug/m3	> 0.3 ug/m^3	No

Source: Appendix D-2.

Carbon Monoxide (CO) Hotspots

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuel. The largest source of CO is vehicle engines, and the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Consequently, violations of the CO standard are generally limited to major intersections during peak-hour traffic conditions. Exposure of humans to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, fatigue, impaired central nervous system function, and angina (chest pain) in persons with serious heart disease. Very high concentrations of CO can be fatal. However, high concentrations are not expected as a result of the project.

BAAQMD's preliminary screening methodology indicates that the project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

1. Project is consistent with an applicable congestion management program established by the County congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

   The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
2. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge, underpass, natural or urban street canyon, below-grade roadway).

Regarding screening criteria number 1, the Contra Costa Transportation Authority (CCTA) serves as the congestion management agency for Contra Costa County and develops and implements the applicable Congestion Management Program (CMP). The CMP outlines CCTA's strategies for managing the performance of regional transportation within the County and must be updated every other year. CCTA updated the CMP most recently in 2019. The CMP covers State highways, principal arterials, and the Bay Area Rapid Transit (BART) system.

CCTA recognizes I-680 and State Route 242 as the nearest CMP-covered highways, and Kirker Pass Road, Ignacio Valley Boulevard, and Clayton Road (west of the intersection of Kirker Pass/Ignacio Valley) as the nearest principal arterials and routes of regional significance. The CMP designates principal arterials with average daily traffic that equals or exceeds 20,000 vehicles per day for a segment of one mile or greater. Chapter 5 of the CMP includes a program to analyze the impacts of land use decisions made by local jurisdictions on these regional transportation systems. For short-range analysis of land use impacts, the CMP relies on the traffic impact analysis required by the Measure J Growth Management Program. That program requires every jurisdiction to conduct a traffic impact analysis for any proposed development project, development plan, or General Plan Amendment that would generate more than 100 net new peak hour vehicle trips (CCTA 2019).

Although the project is located within two miles of the principal arterials and roadways of regional significance that are designated in the CMP, the project would not conflict with the CMP because reclamation activities would only occur for short periods of time and would place very limited traffic on existing roadways. Traffic associated with project reclamation activity would be far less than existing traffic levels associated with mining and processing operations at the site and far less than 100 net new peak hour vehicle trips. Based on the project trip generation estimates reported in Appendix D-1, the project would generate up to 98 daily vehicle trips associated with reclamation activity (during removal of the processing plant which is the reclamation activity with the highest trip count), including all worker, vendor, and hauling trips. This corresponds to 49 trips entering and 49 trips leaving the site each day. To put these figures into perspective, as of 2017 Caltrans estimated that State Route 242 at Concord Avenue, which is the closest of the nearby highways, will experience 136,500 annual average daily traffic (AADT) (Caltrans 2017).

In addition, the proposed project would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour (screening criteria number 2), or to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (screening criteria number 3). Based on BAAQMD's screening criteria, the project's potential CO impacts would be less than significant.

Compass Land Group's CalEEMod modeling results indicate that proposed project's CO emissions would peak at approximately 31.85 pounds per day and 1.29 tons per year in model year 2049 (representing the period of final reclamation activities anticipated to occur in 2068). These values represent mass emissions estimates and not an emissions concentration, which is the metric used in BAAQMD's operational thresholds. As documented by BAAQMD, CO concentrations in the project area currently meet all NAAQS and CAAQS and the Bay Area Air Basin as a whole is in attainment status (meaning meeting standards) for CO (BAAQMD 2017c). State standards, which have been adopted as part of BAAQMD's operational thresholds of significance, are more restrictive than the NAAQS at 9 parts per million (ppm) for the maximum 8-hour concentration and 20 ppm for the maximum 1-hour concentration. CO measurements taken at the Concord air monitoring station since January 2019 indicate a maximum CO concentration of 2.0 ppm (8-hour average) and 9.4 ppm (1-hour average) occurring in April 2020 . Given that these CO concentrations are measured in the urban core where traffic is congested during the morning and afternoon peak hours, they represent much higher concentrations of CO than would be expected at the project site. To put these concentrations into perspective, in 2019 BAAQMD estimated that Treat Blvd. at the Concord air monitoring station would generate 39,864 AADT based on updated traffic count data from April 1, 2019. The project would generate up to 98 daily vehicle trips associated with reclamation activity per day (or 0.2% of the traffic volume at the air monitoring station) (see Appendix D-1).

As a result, the proposed project's impacts relating to CO would be less than significant based on BAAQMD CO screening criteria and Concord (Treat Blvd.) air monitoring station data.

Level of Significance: Less than significant.

Mitigation Measures: None required.

Impact 4.2-4: Result in Other Emissions Adversely Affecting a Substantial Number of People

Project reclamation activities are not expected to introduce significant sources of odors. The project does not involve odor-generating sources aside from direct exhaust emissions associated with operation of construction equipment that generally dissipate rapidly into the atmosphere as distance increases from the source. Furthermore, BAAQMD has not adopted construction-related thresholds of significance for odors. BAAQMD's operational threshold of significance is five confirmed odor complaints per year averaged over three years.

The BAAQMD CEQA Guidelines provide screening distance criteria for a variety of land uses that have the potential to generate odors, such as landfills, composting facilities, rendering plants, and asphalt batch plants. The project reclamation activity does not involve installation or operation of any of the land use categories that might be expected to generate odors. The air consultant also obtained compliance history from BAAQMD for the existing processing facility located on the project site to show that this permitted use (even though it is not part of the proposed project) has not resulted in a significant number of odor complaints as compared to BAAQMD thresholds of significance. CEMEX has received no odor complaints in the last three years.

The project's potential odor impacts are less-than-significant based on the nature of reclamation construction activities and BAAQMD's odor screening criteria.

Level of Significance: Less than significant.

Mitigation Measures: None required.