3.3 Air Quality

This section describes the regulatory and environmental setting for air quality. It also describes impacts on air quality that would result from implementation of the program and the two individual projects and describes mitigation for significant impacts where feasible and appropriate. Mitigation measures are prescribed where feasible and appropriate.

Greenhouse gas emissions are considered separately from the air quality analysis in this PEIR in Chapter 3.7.

3.3.1 Existing Conditions

The program area is within the San Francisco Bay Area Air Basin (SFBAAB), which encompasses a nine-county region consisting of all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin, and Napa Counties and the southern portions of Solano and Sonoma Counties. Because trucks transporting some components and aggregate would travel from the Port of Stockton and the city of Tracy through portions of the San Joaquin Valley Air Basin (SJVAB) to the program area, the study area also includes the SJVAB.

Regulatory Setting

The air quality management agencies of direct importance in Alameda County are EPA, the California Air Resources Board (ARB), and the Bay Area Air Quality Management District (BAAQMD). EPA has established federal air quality standards for which ARB and BAAQMD have primary implementation responsibility. ARB and BAAQMD are also responsible for ensuring that state air quality standards are met. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has jurisdiction over the SJVAB.

Federal

Clean Air Act and National Ambient Air Quality Standards

The federal Clean Air Act (CAA), promulgated in 1963 and amended several times thereafter, including the 1990 Clean Air Act amendments (CAAA), establishes the framework for modern air pollution control. The Act directs EPA to establish National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants (discussed in Section 3.3.2, *Environmental Setting*). The NAAQS are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life. Table 3.3-1 summarizes the NAAQS and the California Ambient Air Quality Standards (CAAQS).

The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for federal standards. The SIP, which is reviewed and approved by EPA, must demonstrate how the federal standards would be achieved. Failing to submit a plan or secure approval can lead to denial of federal funding and permits. In cases where the SIP fails to demonstrate achievement of the standards, EPA is directed to prepare a federal implementation plan.

Table 3.3-1. National and State Ambient Air Quality Standards

Criteria Pollutant	Average Time	California Standards	National Standards[a]	
			Primary	Secondary
Ozone	1-hour	0.09 ppm	None[b]	None[b]
	8–hour	0.070 ppm	0.075 ppm	0.075 ppm
Particulate matter (PM10)	24-hour	50 μg/m³	150 μg/m³	150 μg/m³
	Annual mean	20 μg/m³	None	None
Fine particulate matter (PM2.5)	24-hour	None	35 μg/m³	35 μg/m³
	Annual mean	12 μg/m³	12.0 μg/m³	15 μg/m³
Carbon monoxide	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None
Nitrogen dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppm	None
Sulfur dioxide[c]	Annual mean	None	0.030 ppm	None
	24-hour	0.04 ppm	0.14 ppm	None
	3-hour	None	None	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	None
Lead	30-day Average	1.5 μg/m³	None	None
	Calendar quarter	None	1.5 μg/m³	1.5 μg/m³
	3-month average	None	0.15 μg/m³	0.15 μg/m³
Sulfates	24-hour	25 μg/m³	None	None
Visibility-reducing particles	8-hour	–[d]	None	None
Hydrogen sulfide	1-hour	0.03 ppm	None	None
Vinyl chloride	24-hour	0.01 ppm	None	None

Source: California Air Resources Board 2013a.

ppm = parts per million.

μg/m³ = micrograms per cubic meter.

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and a benchmark for state implementation plans.

[c] The annual and 24-hour NAAQS for SO_2 apply only for one year after designation of the new 1-hour standard to those areas that were previously nonattainment areas for the 24-hour and annual NAAQS.

[d] The CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer (visibility of 10 miles or more due to particles when relative humidity is less than 70%).

Clean Air Nonroad Diesel Rule

To reduce emissions from offroad diesel equipment, EPA established a series of increasingly strict emission standards for new engines. Locomotives and marine vessels are exempt from this rule. Manufacturers of offroad diesel engines are required to produce engines meeting certain emission standards based on the model year the engine was manufactured based on the following compliance schedule.

- Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category.
- Tier 2 standards were phased in from 2001 to 2006.
- Tier 3 standards were phased in from 2006 to 2008.
- Tier 4 standards, which require add-on emissions-control equipment to attain them, are currently being phased in, from 2008 to 2015.

State

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Each air district's clean air plan is specifically designed to attain the standards and must be designed to achieve an annual 5% reduction in district-wide emissions of each nonattainment pollutant or its precursors. When an air district is unable to achieve a 5% annual reduction in district-wide emissions of each nonattainment pollutant or its precursors, the adoption of "all feasible measures" on an expeditious schedule is acceptable as an alternative strategy (Health and Safety Code Section 40914(b)(2)). CAAQS are generally more stringent than the NAAQS and incorporate additional standards for SO_4, H_2S, C_2H_3Cl, and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 3.3-1.

ARB and local air districts bear responsibility for achieving the CAAQSs, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to ARB, which, in turn, has delegated that authority to individual air districts. ARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

Statewide Truck and Bus Regulation

Originally adopted in 2005, the onroad truck and bus regulation requires heavy trucks to be retrofitted with particulate matter (PM) filters. The regulation applies to privately and federally owned diesel fueled trucks with a gross vehicle weight rating (GWR) greater than 14,000 pounds. Compliance with the regulation can be reached through one of two paths: (1) vehicle retrofits according to engine year, or (2) phase-in schedule. Compliance paths ensure that by January 2023, nearly all trucks and buses will have 2010 model year engines or newer.

State Tailpipe Emission Standards

To reduce emissions from offroad diesel equipment, onroad diesel trucks, and harbor craft, ARB established a series of increasingly strict emission standards for new engines. New construction equipment used for the program, including heavy duty trucks and offroad construction equipment, will be required to comply with the standards.

Toxic Air Containment Regulation

California regulates toxic air containments (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). In the early 1980s, ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

In August 1998, ARB identified diesel particulate matter (DPM) emissions from diesel-fueled engines as a TAC. In September 2000, ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles (California Air Resources Board 2000). The goal of the plan is to reduce diesel PM10 (respirable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020. The plan identifies 14 measures that target new and existing onroad vehicles (e.g., heavy-duty trucks and buses), offroad equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). ARB will implement the plan over the next several years. Because the ARB measures are enacted prior to construction, the program would be required to comply with applicable diesel control measures.

The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. The procedure entails research, public participation, and scientific peer review before ARB designates a substance as a TAC. To date, ARB has identified 21 TACs and has also adopted EPA's list of hazardous air pollutants (HAPs) as TACs. In August 1998, DPM was added to the ARB list of TACs (California Air Resources Board 1998).

The Hot Spots Act requires that existing facilities that emit toxic substances above specified levels complete the following steps.

- Prepare a toxic emission inventory.
- Prepare a risk assessment if emissions are significant (i.e., 10 tons per year or if the toxic substance is on District's Health Risk Assessment [HRA] list).
- Notify the public of significant risk levels.
- Prepare and implement risk reduction measures.

ARB has adopted several regulations that will reduce diesel emissions from in-use vehicles and engines throughout California. For example, ARB adopted an idling regulation for onroad diesel-fueled commercial vehicles in July 2004 and updated it in October 2005. The regulation applies to public and privately owned trucks with a GWR greater than 10,000 pounds. Vehicles subject to the regulation are prohibited from idling for more than 5 minutes in any one location. ARB also adopted a regulation for diesel-powered construction and mining vehicles operating. Fleet owners are subject to retrofit or accelerated replacement/repower requirements for which ARB must obtain authorization from EPA prior to enforcement. The regulation also imposes a 5-minute idling limitation on owners, operators, and renters or lessees of offroad diesel vehicles. In some cases, the particulate matter reduction strategies also reduce smog-forming emissions such as NO_X. As an ongoing process, ARB reviews air contaminants and identifies those that are classified as TACs. ARB also continues to establish new programs and regulations for the control of TACs, including DPMs, as appropriate.

Local

Bay Area Air Quality Management District

BAAQMD has local air quality jurisdiction over projects in Alameda 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.

The BAAQMD rules outlined below may apply to the program. Additional BAAQMD rules may apply as project-specific components are identified.

- **Regulation 2, Rule 2 (New Source Review).** This regulation contains requirements for Best Available Control Technology and emission offsets.
- **Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminants).** This regulation outlines guidance for evaluating TAC emissions and their potential health risks.
- **Regulation 6, Rule 1 (Particulate Matter).** This regulation restricts emissions of PM darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- **Regulation 7 (Odorous Substances).** This regulation establishes general odor limitations on odorous substances and specific emission limitations on certain odorous compounds.
- **Regulation 9, Rule 8 (Stationary Internal Combustion Engines).** This regulation limits emissions of NOX and CO from stationary internal combustion engines of more than 50 horsepower.

The Bay Area Air Quality Management District *California Environmental Quality Act Air Quality Guidelines* (BAAQMD Guidelines) provide procedures for assessing air quality impacts and preparing the air quality sections of environmental documents under CEQA. The guidelines identify methodologies for predicting project emissions and impacts and present measures that can be used to avoid or reduce air quality impacts. Also outlined in the BAAQMD Guidelines are advisory emissions thresholds that the district has adopted to help CEQA lead agencies determine whether construction and operational activities associated with projects would have significant adverse environmental impacts (Bay Area Air Quality Management District 2011).

In August 2013, the First District Court of Appeals reversed a lower superior court ruling that the BAAQMD needed to comply with CEQA prior to adopting its 2010 Air Quality Guidelines and significance thresholds, thereby issuing a writ of mandate ordering BAAQMD to set aside the thresholds and cease their dissemination until BAAQMD complied with CEQA. However, the

Appellate court ruled that adoption of the guidelines and thresholds is not considered a project subject to CEQA review, and adoption of the significance thresholds was not arbitrary and capricious. As of November 2013, the BAAQMD has yet to formally re-recommend its Air Quality Guidelines and significance thresholds for use by local agencies, but they are now authorized to do so by the Appellate court.

Other air quality plans BAAQMD has adopted include the *Bay Area 2001 Ozone Attainment Plan* (Ozone Plan), aimed at reducing ozone and achieving the NAAQS ozone standard. The ARB prepared a Redesignation Request, Attainment Demonstration, and Maintenance Plan for carbon monoxide (CO) in 1996 that includes strategies to ensure continuing attainment of the NAAQS for CO; this plan was subsequently revised in 1998 and 2004. In 2010, the district also adopted the 2010 Clean Air Plan, which updates the Ozone Plan and provides an integrated, multi-pollutant strategy to improve air quality, protect public health, and protect the climate.

San Joaquin Valley Air Pollution Control District

SJVAPCD is the regional air quality agency with jurisdiction over the SJVAB. Although the program area is located within BAAQMD's jurisdiction, it is assumed that trucks transporting some components and aggregate would travel from the Port of Stockton and the city of Tracy through portions of the SJVAB to the program area. Because the program area is located in the SFBAAB, the SJVAPCD rules and clean air plans would not be applicable to the program. However, in order to disclose air quality impacts within the SJVAB, this analysis includes discussion of potential impacts associated with heavy-duty truck emissions that would be generated within the SJVAB. In addition, the SJVAB is downwind of the project site some emissions that are emitted at the project site within the SFBAAB would likely drift into the SJVAB through a process known as transport. The ARB has identified the SFBAAB as a transport contributor to the SJVAB (California Air Resources Board 2009). For detailed studies of pollutant transport within California, please refer to http://www.arb.ca.gov/aqd/transport/transport.htm. However, it is extremely difficult and would be speculative to determine the quantity of emissions that will traverse air basin boundaries due to the high variability in wind patterns and local weather. Therefore, these emissions were not estimated. Project emissions that would be generated in the SJVAB are assessed using significance thresholds identified in SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (San Joaquin Valley Air Pollution Control District 2002).

Alameda County General Plan—East County Area Plan

The ECAP, a part of the Alameda County General Plan, contains air quality goals and policies to address air pollution concerns in the eastern area of the county. The ECAP air quality goal is to "ensure that air pollution levels do not threaten public health and safety, economic development, or future growth" (Alameda County 2000:70). The ECAP was last revised in 2000 by the voter initiative Measure D; however, it did not result in any changes to policies regarding air quality. ECAP policies applicable to the program include those listed below (Alameda County 2000:70–71).

- **Policy 296:** The County shall review the cumulative impact of proposed projects for their potential effect on air quality conditions.
- **Policy 297:** The County shall coordinate air quality planning efforts with other local, regional and state agencies.
- **Policy 300:** The County shall review proposed projects for their potential to generate hazardous air pollutants.

- **Policy 302:** The County shall include buffer zones within new residential and sensitive receptor site plans to separate those uses from freeways, arterials, point sources and hazardous material locations.
- **Policy 303:** The County shall incorporate the provisions of the Association of Bay Area Government's (ABAG) Bay Area Air Quality Plan and the Bay Area Air Quality Management District's (BAAQMD) Air Quality and Urban Development Guidelines into project review procedures.
- **Policy 304:** The County shall notify cities and the Bay Area Air Quality Management District (BAAQMD) of proposed projects which may significantly affect air quality.

Environmental Setting

Regional Topography, Meteorology, and Climate

The topography of the program area is dominated by northwest-southeast-trending ridge lines that reach an elevation of approximately 800 to 1,400 feet above mean sea level (msl). The elevations of intervening valley bottoms in the program area are from approximately 400 to 800 feet above msl. The climate of the SFBAAB is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the west coast of North America. High pressure systems are characterized by an upper layer of dry air that warms as it descends, which restricts the mobility of cooler marine-influenced air near the ground surface and results in the formation of subsidence inversions. During the winter, the Pacific high-pressure system shifts southward, thereby allowing storms to pass through the region. During summer and fall, emissions generated within the SFBAAB can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone.

The program area is generally well-ventilated by winds. Winter prevailing wind directions span the north-northeast through east-northeast sectors, caused by drainage off of the hills and flow out of the Altamont Pass. During the summer months, cold water upwelling along the coast and hot inland temperatures can cause a strong onshore pressure gradient that translates into a strong, afternoon wind. BAAQMD operates a regional air quality monitoring network; the closest station to the program area is the Livermore Monitoring Station on Rincon Avenue in the City of Livermore, which is approximately 9 miles to the south-southwest. In Livermore, over 70% of the wind is from the south-southwest to west-southwest, and by the afternoon, 35% of the wind speed is about 11 miles per hour (mph). However, the program area tends to be a receptor of ozone and ozone precursors from San Francisco, Alameda, western and northern Contra Costa County, and Santa Clara County and, during the summer months, temperatures tend to be warm, which promotes the formation of ozone (Bay Area Air Quality Management District 2010). In turn, the SJVAB and the Central Valley in general that is downwind of the program area also is a receptor of these same pollutants, accumulating with emissions from the Tri-Valley area and to some degree northern Contra Costa County and southern Solano County. The ARB has identified the SFBAAB as a transport contributor to the Sacramento region, the Mountain Counties Air Basin, the North Central Coast Air Basin, the North Coast Air Basin, the San Joaquin Valley Air Basin, and the South Central Coast Air Basin (California Air Resources Board 2010).

Temperature and precipitation data collected in Livermore indicate that the program area typically has average maximum and minimum winter (i.e., January) temperatures of 57 and 37 degrees Fahrenheit (°F), respectively, while average summer (i.e., July) maximum and minimum temperatures are 89 and 54 °F, respectively. Precipitation in the program area averages approximately 14 inches per year (Western Regional Climate Center 2013).

Air Pollutants of Concern

The federal government has established NAAQS, and the state has established CAAQS, respectively, for six criteria pollutants: ozone, CO, lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and PM.

Ozone and NO_2 are considered regional pollutants because they (or their precursors) affect air quality on a regional scale; NO_2 reacts photochemically with reactive organic gases (ROGs) to form ozone, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as CO, SO_2, and Pb are considered to be local pollutants that tend to accumulate in the air locally. PM is considered to be a local as well as a regional pollutant.

The primary pollutants of concern in the study area are ozone (including nitrogen oxides [NO_X]), CO, and PM. Principal characteristics surrounding these pollutants are discussed below. TACs are also discussed, although no air quality standards exist for these pollutants.

Ozone

Ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and increase susceptibility to respiratory infections. It is also an oxidant that can cause extensive damage to plants through leaf discoloration and cell damage. It can cause substantial damage to other materials as well, such as synthetic rubber and textiles.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors—ROG and NO_X—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_X, are mainly emitted by mobile sources and by stationary combustion equipment.

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases, including ROGs and volatile organic compounds (VOCs). ROGs are defined by state rules and regulations; VOCs are defined by federal rules and regulations. For the purposes of this assessment, hydrocarbons are classified and referred to as ROGs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry-cleaning solutions, and paint (through evaporation).

The health effects of hydrocarbons result from the formation of ozone. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered TACs. There are no separate health standards for ROGs, although some are also toxic; for example, benzene is both a ROG and a carcinogen.

Nitrogen Oxides

Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone and react in the atmosphere to form acid rain. Nitrogen dioxide, often used interchangeably with NO_X, is a brownish, highly reactive gas that is present in all urban environments. The major human sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (U.S. Environmental Protection Agency 2013a). The combined emissions of NO 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 particular geographical area may not be representative of local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects primarily depends on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, such as coughing, difficulty breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe symptomatic NO_2 intoxication after acute exposure has been linked to prolonged respiratory impairment, with such symptoms as emphysema, bronchitis, and aggravating existing heat disease (U.S. Environmental Protection Agency 2013b).

Carbon Monoxide

Carbon Monoxide (CO), a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains emit CO. Automobile exhaust releases most of the CO in urban areas. CO is a nonreactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. Because motor vehicles are the dominant source of CO emissions, CO hotspots are normally located near roads and freeways with high traffic volume.

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. PM also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter less than 10 microns in diameter, about 1/7 the thickness of a human hair, is referred to as PM10. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28 the diameter of a human hair, is referred to as PM2.5. Major sources of PM10 include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM2.5 results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, PM10 and PM2.5 can be formed in the atmosphere from gases such as SO_2, NO_X, and VOCs.

PM10 and PM2.5 pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM10 and PM2.5 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body; they can also transport absorbed gases such as chlorides or ammonium into the lungs and cause injury. Whereas particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, and contribute to haze and reduce regional visibility.

Toxic Air Contaminants

Although NAAQS and CAAQS exist for criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or other acute (short-term) or chronic (long-term) health problems. For TACs that are known or suspected carcinogens, ARB has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health effects, a similar factor, called a Hazard Index, is used to evaluate risk. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Examples of TAC sources include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources.

Sulfur Oxides

Sulfur oxides are any of several compounds of sulfur and oxygen, of which the most relevant to air quality is SO_2. SO_2 is a respiratory irritant that causes the bronchioles to constrict with inhalation at 5 parts per million (ppm) or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis. SO_2 is produced by coal and oil combustion and such stationary sources as steel mills, refineries, and pulp and paper mills.

Lead

Lead (Pb) is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it persists forever. Lead was used several decades ago to increase the octane rating in automotive fuel; therefore, gasoline-powered automobile engines were a major source of airborne lead. Since the use of leaded fuel has been mostly phased out, the ambient concentrations of lead have dropped dramatically.

Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma, or even death. However, even small amounts of lead can be harmful, especially to infants, young children, and pregnant women. Lead exposure is most serious for young children because they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low-level exposure may harm the intellectual development, behavior, size, and hearing of infants. During pregnancy, especially in the last trimester, lead can adversely affect the fetus. Female workers exposed to high levels of lead have more miscarriages and stillbirths.

Symptoms of long-term exposure to lower lead levels may be less noticeable but are still serious. Anemia is common, and damage to the nervous system may cause impaired mental function. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability, and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

Diesel Particulate Matter

In 1998, ARB identified DPM as a toxic air contaminant (California Air Resources Board 1998). On a statewide basis, the average potential cancer risk associated with DPM is more than 500 potential cases per million people. The OEHHA estimated the potential cancer risk from a 70-year exposure to DPM at a concentration of 1 microgram per cubic meter ($\mu g/m^3$) ranges from 130 to 2,400 excess cancer cases per million people. A scientific review panel concluded that an appropriate point estimate of unit risk for a 70-year exposure to DPM is 300 excess cancer cases per million people (California Air Resources Board 2000).

The DPM of greatest health concern are those in the categories of fine (PM10) and ultra-fine (PM2.5). These fine and ultra-fine particles may be composed of elemental carbon with adsorbed compounds, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The fine and ultra-fine particles are respirable, which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lungs.

Existing Air Quality Conditions

Existing air quality conditions in the study area can be characterized by monitoring data collected in the region. Though the Livermore–793 Rincon Avenue monitoring station is the closest station to the program area, this monitoring station does not report CO or PM10 conditions in the area. The closest monitoring station to monitor CO is the Fremont–Chapel Way monitoring station located approximately 20 miles west and mostly upwind of the program area. The closest monitoring station to monitor PM10 is the Tracy–Airport monitoring station located approximately 12 miles east of the program area in San Joaquin County. Recent air quality monitoring results from these stations are summarized in Table 3.3-2. The data represent air quality monitoring for the last 3 years for which a complete dataset is available (2010–2012). As indicated in Table 3.3-2, there have been some violations of state and federal air quality standards during this time period for ozone and PM2.5.

Table 3.3-2. Summary of 2010-2012 Ambient Air Quality in the Program Area Vicinity

Pollutant Standards	2010	2011	2012
Ozone (O_3)—Livermore – 795 Rincon Avenue			
Maximum 1-hour concentration (ppm)	0.150	0.115	0.102
Days exceeding[a] the CAAQS 1-hour standard (>0.09 ppm)	3	3	2
Maximum 8-hour concentration (ppm)	0.098	0.085	0.090
Days exceeding[a] the CAAQS 8-hour (>0.070 ppm)	6	9	4
Days exceeding[a] the NAAQS 8-hour (>0.075 ppm)	3	2	3
Carbon monoxide (CO)—Fremont – Chapel Way			
Maximum 8-hour concentration (ppm)	0.94	–	–
Days exceeding[a] the NAAQS 8-hour (≥9 ppm)	0	0	0
Days exceeding[a] the CAAQS 8-hour (≥9.0 ppm)	0	0	0
Nitrogen Dioxide (NO_2)—Livermore – 795 Rincon Avenue			
State maximum 1-hour concentration (ppm)	0.058	0.057	0.043
Annual average concentration (ppm)	0.011	0.011	–
Days exceeding[a] the CAAQS 1-hour (0.18 ppm)	0	0	0
Particulate matter (PM10)—Tracy – Airport			
National[b] maximum 24-hour concentration (μg/m³)	28.5	110.8	73.4
State[c] maximum 24-hour concentration (μg/m³)	–	–	–
Days exceeding[a] the NAAQS 24-hour (>150 μg/m³)[g]	0	0	0
Days exceeding[a] the CAAQS 24-hour (>50 μg/m³)[g]	–	–	–
Particulate matter (PM2.5)—Livermore – 795 Rincon Avenue			
National[b] maximum 24-hour concentration (μg/m³)	34.7	45.4	31.1
State[c] maximum 24-hour concentration (μg/m³)	34.7	23.6	–
Days exceeding[a] the NAAQS 24-hour (>35 μg/m³)	0	2	0

Source: California Air Resources Board 2013b.

ppm = parts per million.
CAAQS = California Ambient Air Quality Standards.
NAAQS = National Ambient Air Quality Standards.
μg/m³ = micrograms per cubic meter.
– = data not available.

[a] An exceedance is not necessarily a violation. This is a mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

[b] Measurements usually are collected every 6 days.

[c] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

Attainment Status

Local monitoring data (Table 3.3-2) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are defined as follows.

- **Nonattainment**—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- **Maintenance—**assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- **Attainment**—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- **Unclassified**—assigned to areas were data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3.3-3 summarizes the attainment status of Alameda County with regard to the NAAQS and CAAQS. Table 3.3-4 summarizes the attainment status of the SJVAB with regard to the NAAQS and CAAQS (San Joaquin Valley Air Pollution Control District 2013).

Table 3.3-3. Federal and State Attainment Status for Alameda County

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	–[a]	Serious Nonattainment
O_3 (8-hour)	Marginal Nonattainment (2008)	Nonattainment
CO	Maintenance	Attainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment (2006)	Nonattainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment (2008)	Attainment
Sulfates	(No Federal Standard)	Attainment
Hydrogen sulfide	(No Federal Standard)	Unclassified
Visibility	(No Federal Standard)	Unclassified

Sources: California Air Resources Board 2011; U.S. Environmental Protection Agency 2012.

O_3 = ozone.
CO = carbon monoxide.
PM10 = particulate matter less than or equal to 10 microns.
PM2.5 = particulate matter less than or equal to 2.5 microns.
NO_2 = nitrogen dioxide.
SO_2 = sulfur dioxide.

[a] The federal 1-hour standard of 12 parts per hundred million (pphm) was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in the state implementation plans.

Table 3.3-4. Federal and State Attainment Status for San Joaquin Valley

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	(No Federal Standard)	Severe Nonattainment
O_3 (8-hour)	Extreme Nonattainment	Nonattainment
CO	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment (2006)	Nonattainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	No Designation	Attainment
Sulfates	(No Federal Standard)	Attainment
Hydrogen sulfide	(No Federal Standard)	Unclassified
Visibility	(No Federal Standard)	Unclassified

O_3 = ozone.
CO = carbon monoxide.
PM10 = particulate matter less than or equal to 10 microns.
PM2.5 = particulate matter less than or equal to 2.5 microns.
NO_2 = nitrogen dioxide.
SO_2 = sulfur dioxide.

Sensitive Receptors

For the purposes of air quality analysis, sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (e.g., 24-hour, 8-hour, and 1-hour). Typical sensitive receptors include residences, hospitals, and schools. While the program area is located in the rural setting of the Altamont Pass, sensitive receptors in the program area vicinity include scattered residences throughout and adjacent to the program area. As indicated in Chapter 2 of this PEIR, *Program Description*, Alameda County has established setback requirements for siting turbines within certain types of land uses (e.g., residential, commercial, recreational), and infrastructure (public roads), and turbines would not be located within these setback distances. Outside the program area, approximately 4,500 feet to the west of the program area is a community of single family residences in the city of Livermore, and 5,000 feet to the east is the community of Mountain House, which contains single family residences, three elementary schools and childcare facilities, and public parks and open spaces.

3.3.2 Environmental Impacts

Methods for Analysis

Criteria pollutant emissions were estimated for construction and operational activities at a programmatic level with additional detail given to two specific repowering projects, the Golden Hills and Patterson Pass Projects, which fall within the program area. Emissions were calculated for a typical 80 MW repowering project using project data from the *Vasco Winds Repowering Project Draft Environmental Impact Report* (Contra Costa County 2010). This was done because project-specific information for the proposed projects was very limited, and the repowering activities are not yet determined. Because the Vasco example provides a comprehensive analysis of typical construction activity for repowering, it was used to estimate total and daily emissions for the proposed projects, as it is considered representative of a typical project associated with the program. Total emissions from the Vasco example were then scaled to the program and the Golden Hills and Patterson Pass Projects based on the nameplate capacity of the program area. The scaling factors for total construction emissions are as follows: 5.21 for program Alternative 1: 417 MW (416.5 MW nameplate capacity ÷ 80 MW metric nameplate capacity); 5.63 for program Alternative 2: 450 MW (450 MW nameplate capacity ÷ 80 MW metric nameplate capacity);1.02 for the Golden Hills Project (81.5 MW nameplate capacity ÷ 80 MW metric nameplate capacity); and 0.25 for the Patterson Pass Project (19.8 MW nameplate capacity ÷ 80 MW metric nameplate capacity). Annual construction emissions from the Vasco example were also scaled to the program and the Golden Hills and Patterson Pass Projects using a maximum annual nameplate capacity of 100 MW installed. This produces a scaling factor of 1.25 to estimate annual emissions from both Alternative 1 and Alternative 2 (100 MW maximum ÷ 80 MW metric nameplate capacity). Since the nameplate capacity of the Golden Hills and Patterson Pass Projects are less than 100MW, it was assumed that all emissions from these projects would occur during one calendar year**.**

Construction emissions were estimated for each phase of construction for three major contributors: offroad equipment, onroad vehicles (including truck trips and worker commutes), and concrete batch plant operations. Calculation methods from the following sources were used to estimate emissions: the California Emissions Estimator Model (CalEEMod) (South Coast Air Quality Management District 2011), the EPA Emissions Factors & AP 42 Compilation of Air Pollutant Emission Factors document (U.S. Environmental Protection Agency 1995a, 1995b, 1995c), and the ARB EMission FACtors (EMFAC) 2011 model (California Air Resources Board 2013c). Additional standard emission factors, conversion factors, and methods were used to estimate emissions per standard air quality protocol consistent with BAAQMD guidance.

Operational emissions were estimated for offroad equipment (maintenance/operation activities) and onroad vehicles (including truck trips and worker commutes). Calculation methods from the same sources as listed above for construction emissions were used to estimate operational emissions.

The concrete batch plant would produce fugitive dust emissions during the manufacture of concrete. Approximately 0.0157 pounds of PM10 would be emitted per cubic yard of concrete produced (U.S. Environmental Protection Agency 1995c). It was assumed that PM2.5 represents 0.674% of PM10 (South Coast Air Quality Management District 2006). Stationary source emissions from fuel combustion at the batch plants were not estimated because specific data on the types of equipment (generators, engines, etc.) that would be used at the batch plants were not available. In addition, the batch plants are permitted sources under BAAQMD and emissions would be minor after required air district Best Available Control Technologies (BACTs) and offsets.

Important assumptions (associated with the 80 MW project example) used in the analysis are presented below.

- Emissions were estimated for a typical 80 MW repowering project and scaled to the program, Golden Hills Project, and Patterson Pass Project based on the nameplate capacity of the program area and the two project areas.

- For the program alternatives, the maximum annual nameplate capacity installed is 100 MW. This produces a scaling factor of 1.25 for emissions from the 80 MW project Vasco example to estimate annual emissions from both Alternative 1 and Alternative 2.
- Offroad equipment types, fuel types, and phasing (days of construction for each construction phase for each month of the year) for construction and operational activities were taken from the *Vasco Winds Repowering Project Draft Environmental Impact Report* (Contra Costa County 2010).
- Construction activity will occur 8 hours per day, 5 days per week.
- Fugitive dust emissions from grading are calculated for graders and bulldozers using CalEEMod methods, which calculate emissions on a per-mile basis for graders and a per-hour basis for bulldozers. Each grader travels at an average speed of 7.1 mph with a blade width of 12 feet to cover 292 total acres for a total mileage of grading of 201 miles (8.3 miles average per day). Each bulldozer operates 8 hours per day during construction.
- There will be 10,800 annual (55 average daily) light-duty truck trips, 16,605 annual (85 average daily) heavy-duty truck trips for material delivery and removal, and 6,338 annual (33 average daily) heavy-duty truck trips for water delivery (water tankers).
- Each light-duty trip will include 1.0 mile of 15 mph travel (ridge line), 1.0 mile of 25 mph travel (access roads), and 23 miles of 55 mph travel (freeway), for a total roundtrip distance of 25 miles.
- Each heavy-duty trip will include 5.0 miles of 15 mph travel (ridge line), 1.0 mile of 25 mph travel (access roads), and 29 miles of 55 mph travel (freeway) for a total roundtrip distance of 35 miles. Each water tanker truck trip would include 6.0 miles of 15 mph travel (ridge line), 1.0 mile of 25 mph travel (access roads), and 19 miles of 55 mph travel (freeway), for a total roundtrip distance of 26 miles.
- Worker commute roundtrips are 25 miles; worker vehicles travel at an average of 55 mph. There will be 16,790 annual (86 average daily and 150 maximum daily) worker commute trips for construction and 2,226 annual (8.5 average daily) worker commute trips for operation.
- Approximately 3,500 cubic yards of concrete will be produced at the concrete batch plants per year (55 cubic yards on average per day).

Determination of Significance

In accordance with Appendix G of the State CEQA Guidelines, program Alternative 1, program Alternative 2, the Golden Hills project, or the Patterson Pass project would be normally considered to have a significant effect if it would result in any of the conditions listed below.

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the program or project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).

- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people

According to the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make significance determinations for potential impacts on environmental resources. Consequently, the analysis used in this document uses methodologies provided in the updated BAAQMD Guidelines (Bay Area Air Quality Management District 2012). Although the 2010 BAAQMD Guidelines and their 2011 update have been challenged in court, and BAAQMD has removed all references of the 2010/2011 adopted thresholds from the 2012 BAAQMD Guidelines, the 2010/2011 BAAQMD Guidelines contain quantitative significance thresholds for project-related construction exhaust emissions and operational emissions. Because the 2010/2011 thresholds are more stringent and comprehensive than the 1999 thresholds (as recommended for use in the 2012 BAAQMD Guidelines), the 2010/2011 thresholds are used to determine significance for construction and operational activities (Bay Area Air Quality Management District 2011). There are no quantitative thresholds for construction impacts associated with fugitive dust, so these impacts are addressed using applicable BAAQMD-recommended mitigation measures for dust abatement.

Under the 2010/2011 BAAQMD thresholds, a project would have a significant short-term construction-related or long-term operational air quality impact if it would exceed BAAQMD's thresholds shown in Table 3.3-5.

Table 3.3-5. BAAQMD Thresholds of Significance

Pollutant	Construction	Operations
ROG	54 lbs/day	54 lbs/day or 10 tons/year
NO_X	54 lbs/day	54 lbs/day or 10 tons/year
CO	–	Violation of CAAQS
PM10 (total)	–	–
PM10 (exhaust)	82 lbs/day	82 lbs/day or 15 tons/year
PM2.5 (exhaust)	54 lbs/day	54 lbs/day or 10 tons/year
PM10/PM2.5 (fugitive dust)	BMPs	–
TACs (project-level)	Increased cancer risk of 10 in 1 million; increased non-cancer risk of greater than 1.0 (hazard index [HI]); PM2.5 increase of greater than 0.3 micrograms per cubic meter	Same as construction
TACs (cumulative)	Increased cancer risk of 100 in 1 million; increased non-cancer risk of greater than 10.0; PM2.5 increase of greater than 0.8 microgram per cubic meter at receptors within 1,000 feet	Same as construction
Odors	–	Five complaints per year averaged over 3 years

Source: Bay Area Air Quality Management District 2011.
lbs = pounds.
CAAQS = California Ambient Air Quality Standards.
BMPs = best management practices.

Both average daily and maximum daily emissions were calculated for the project, and maximum daily emissions were compared to the daily thresholds listed in Table 3.3-5, per the recommendation of BAAQMD staff (Kirk pers. comm.).

For projects that would result in an increase in ROG, NO_X, PM10, or PM2.5 of more than their respective project-level daily mass thresholds indicated in Table 3.3-5, then it would also be considered to contribute considerably to a significant cumulative impact. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. Therefore, if a project would exceed the project-level significance thresholds identified in Table 3.3-5, its emissions would be cumulatively considerable; if a project would not exceed the significance thresholds, its emissions would not be cumulatively considerable.

In addition to emissions that would be generated in BAAQMD's jurisdiction, the portion of equipment and material haul trips that would originate at the Port of Stockton and in the city of Tracy would be generated in the SJVAB, which is under SJVAPCD's jurisdiction. Therefore, the heavy-duty truck trip exhaust emissions that would be generated in the SJVAB have been quantified. In addition, the SJVAB is downwind of the project site and may receive some emissions that are emitted at the project site within the SFBAAB due to transport. However, it is extremely difficult and would be speculative to determine the quantity of emissions that will traverse air basin boundaries due to the high variability in wind patterns and local weather. Therefore, these emissions were not estimated nor compared to the SJVAPCD's thresholds.

SJVAPCD's published guidelines, *Guide for Assessing Air Quality Impacts* (San Joaquin Valley Air Pollution Control District 2002), do not require the quantification of construction emissions. Rather, it requires implementation of effective and comprehensive feasible control measures to reduce PM10 emissions (San Joaquin Valley Air Pollution Control District 2002). SJVAPCD considers PM10 emissions to be the greatest pollutant of concern when assessing construction-related air quality impacts and has determined that compliance with its Regulation VIII, including implementation of all feasible control measures specified in its guidance manual (San Joaquin Valley Air Pollution Control District 2002), constitutes sufficient mitigation to reduce construction-related PM10 emissions to less-than-significant levels and minimize adverse air quality effects. All construction projects must abide by Regulation VIII. Since the publication of the district's guidance manual, the district has revised some of the rules comprising Regulation VIII. Guidance from district staff indicates that implementation of a dust control plan would satisfy all of the requirements of Regulation VIII (Siong pers. comm.). Further consultation with SJVAPCD staff indicates that, though explicit thresholds for construction-related emissions of ozone precursors are not enumerated in the guidance manual, SJVAPCD considers a significant impact to occur when construction emissions of ROG or NO_X exceed 10 tons per year or if PM10 or PM2.5 emissions exceed 15 tons per year (Siong pers. comm.).

SJVAPCD's thresholds of significance used in this analysis, as indicated in its *Guide for Assessing and Mitigating Air Quality Impacts* (San Joaquin Valley Air Pollution Control District 2002) and through consultation with SJVAPCD staff, are summarized below.

- Project implementation would produce emissions increases greater than 10 tons/year ROG.
- Project implementation would produce emissions increases greater than 10 tons/year NO_X.
- Project implementation would produce emissions increases greater than 15 tons/year PM10.

- Project implementation would produce emissions increases greater than 15 tons/year PM2.5

SJVAPCD does not have established quantitative CEQA thresholds for construction activities. Therefore, in lieu of CEQA significance thresholds for construction emissions, estimated emissions that would be generated by the proposed projects under the program in the SJVAB are compared to SJVAPCD's operational CEQA threshold of 10 tons per year for both NO_X and ROG and 15 tons per year for both PM10 and PM2.5 (San Joaquin Valley Air Pollution Control District 2002). Under the SJVAPCD thresholds, a project would have a significant short-term construction-related or long-term operational air quality impact if it would exceed SJVAPCD's thresholds shown in Table 3.3-6.

Table 3.3-6. SJVAPCD Thresholds of Significance

Pollutant	Construction	Operations
ROG	–	10 tons/year
NO_X	–	10 tons/year
CO	–	Violation of CAAQS
PM10 (total)	–	15 tons/year
PM2.5 (total)	–	15 tons/year

Sources: San Joaquin Valley Air Pollution Control District 2002; Siong pers. comm.
CAAQS = California Ambient Air Quality Standards.

Impacts and Mitigation Measures

Impact AQ-1a-1: Conflict with or obstruct implementation of the applicable air quality plan—program Alternative 1: 417 MW (less than significant)

In order to determine that a project is consistent with the applicable air quality plan, which in this case is the *Bay Area 2010 Clean Air Plan* (Bay Area 2010 CAP), it is necessary to demonstrate that program Alternative 1 does not exceed the population or employment growth assumptions contained in the plan, which would lead to increased vehicle miles traveled beyond those estimated in the plan. Implementation of Alternative 1 would result in no new permanent employees relative to existing conditions, nor would it increase population projections. Therefore, Alternative 1 would not induce population or employment growth and would result in no net increase in vehicle miles traveled in the SFBAAB. Alternative 1's potential impacts on population and housing are discussed in Chapter 3.12, *Population*; potential transportation-related impacts are discussed in Section 3.16, *Traffic*.

In addition, although short-term mitigated emissions resulting from Alternative 1 construction would exceed the BAAQMD significance thresholds for ROG and NO_X (see Impact AQ-2a-1), Alternative 1 would result in long-term benefits from new renewable wind-generated energy, including reduction of ROG and NO_X emissions relative to the production of comparable energy from fossil fuel sources. Thus, Alternative 1 would be consistent with the Bay Area 2010 CAP regardless of this short-term impact.

It is assumed that trucks transporting some components and aggregate would travel from the Port of Stockton and the city of Tracy through portions of the SJVAB to the program area. However, SJVAPCD rules and clean air plans would not be applicable to Alternative 1 because the program area is located in the SFBAAB. Therefore, no conflict with SJVAPCD clean air plans would occur.

This impact would be less than significant. No mitigation is required.

Impact AQ-1a-2: Conflict with or obstruct implementation of the applicable air quality plan—program Alternative 2: 450 MW (less than significant)

In order to determine that a project is consistent with the applicable air quality plan, which in this case is the *Bay Area 2010 Clean Air Plan* (Bay Area 2010 CAP), it is necessary to demonstrate that program Alternative 2 does not exceed the population or employment growth assumptions contained in the plan, which would lead to increased vehicle miles traveled beyond those estimated in the plan. Implementation of Alternative 2 would result in no new permanent employees relative to existing conditions, nor would it increase population projections. Therefore, Alternative 2 would not induce population or employment growth and would result in no net increase in vehicle miles traveled in the SFBAAB. Alternative 2's potential impacts on population and housing are discussed in Chapter 3.12, *Population*; potential transportation-related impacts are discussed in Section 3.16, *Traffic*.

In addition, although short-term mitigated emissions resulting from Alternative 2 construction would exceed the BAAQMD significance thresholds for ROG and NO_X (see Impact AQ-2a-2), Alternative 2 would result in long-term benefits from new renewable wind-generated energy, including reduction of ROG and NO_X emissions relative to the production of comparable energy from fossil fuel sources. Thus, Alternative 2would be consistent with the Bay Area 2010 CAP regardless of this short-term impact.

It is assumed that trucks transporting some components and aggregate would travel from the Port of Stockton and the city of Tracy through portions of the SJVAB to the program area. However, SJVAPCD rules and clean air plans would not be applicable to Alternative 2because the program area is located in the SFBAAB. Therefore, no conflict with SJVAPCD clean air plans would occur.

This impact would be less than significant. No mitigation is required.

Impact AQ-1b: Conflict with or obstruct implementation of the applicable air quality plan—Golden Hills Project (less than significant)

The impact for the Golden Hills Project is similar to that of the program. Implementation of the Golden Hills Project would result in no new permanent employees relative to existing conditions, nor would it increase population projections. Therefore, the Golden Hills Project would not induce population or employment growth and would result in no net increase in vehicle miles traveled in the SFBAAB. The Golden Hills Project's potential impacts on population and housing are discussed in Chapter 3.12, *Population*; potential transportation-related impacts are discussed in Section 3.16, *Traffic*.

In addition, although short-term mitigated emissions resulting from Golden Hills Project construction would exceed the BAAQMD significance threshold for NO_X (see Impact AQ-2b), the Golden Hills Project would result in long-term benefits from new renewable wind-generated energy, including reduction of NO_X emissions relative to the production of comparable energy from fossil fuel sources. Thus, the Golden Hills Project would be consistent with the Bay Area 2010 CAP regardless of this short-term impact.

It is assumed that trucks transporting some components and aggregate would travel from the Port of Stockton and the city of Tracy through portions of the SJVAB to the project area. However, SJVAPCD rules and clean air plans would not be applicable to the proposed project because the project area is located in the SFBAAB. Therefore, no conflict with SJVAPCD clean air plans would occur.

This impact would be less than significant. No mitigation is required.

Impact AQ-1c: Conflict with or obstruct implementation of the applicable air quality plan—Patterson Pass Project (less than significant)

The impact for the Patterson Pass Project is similar to that of the program. Implementation of the Patterson Pass Project would result in no new permanent employees relative to existing conditions, nor would it increase population projections. Therefore, the Patterson Pass Project would not induce population or employment growth and would result in no net increase in vehicle miles traveled in the SFBAAB. The Patterson Pass Project's potential impacts on population and housing are discussed in Chapter 3.12, *Population*; potential transportation-related impacts are discussed in Section 3.16, *Traffic*.

In addition, although short-term mitigated emissions resulting from Patterson Pass Project construction would exceed the BAAQMD significance threshold for NO_X (see Impact AQ-2c), the Patterson Pass Project would result in long-term benefits from new renewable wind-generated energy, including reduction of NO_X emissions relative to the production of comparable energy from fossil fuel sources. Accordingly, the Patterson Pass Project would be consistent with the Bay Area 2010 CAP regardless of this short-term impact.

It is assumed that trucks transporting some components and aggregate would travel from the Port of Stockton and the city of Tracy through portions of the SJVAB to the project area. However, SJVAPCD rules and clean air plans would not be applicable to the proposed project because the project area is located in the SFBAAB. Therefore, no conflict with SJVAPCD clean air plans would occur.

This impact would be less than significant. No mitigation is required.

Impact AQ-2a-1: Violate any air quality standard or contribute substantially to an existing or projected air quality violation—program Alternative 1: 417 MW (significant and unavoidable)

Construction Activities

Based on the assumptions presented above, construction of the various projects under the program would occur over a period of 9 months per year for approximately 4 years. It is estimated that there would be approximately 184 workdays per year that would involve the use of heavy construction equipment. Construction activities at the program area would be associated with decommissioning and foundation removal of existing turbine sites; laydown, substations, and switch yards; road construction; turbine foundations and batch plant operation; turbine delivery and installation; utility collector line installation; and restoration and clean-up. Each of these activities would occur over periods that would range from approximately 2 to 4 months. It is estimated that as many as 90 pieces of offroad construction equipment, including cranes, excavators, graders, loaders, cement trucks, and dozers, would be required for an average of 8 hours per day to construct various projects under the program. At any given time, from 6 to 54 pieces of construction equipment would be operating concurrently, depending on the construction phasing.

In addition to the offroad equipment, onroad vehicle trips would be required to deliver materials and equipment to the construction sites as well as to transport workers to and from the construction sites (see Chapter 2, *Program Description*, *Traffic and Parking* section). It is anticipated that an average of approximately 140 truck trips and 86 commuting worker trips would be required per day during the 9-month construction period for each year. It is anticipated that the majority of equipment and material-related truck trips would originate at the Port of Stockton and in the city of Tracy and that the construction worker–related commute trips would occur entirely within the SFBAAB. The portion of the equipment, material, and aggregate haul trips that would originate at the Port of Stockton and in the city of Tracy would be generated in the SJVAB, which is under SJVAPCD's jurisdiction. Therefore, the heavy-duty truck trip exhaust emissions that would be generated in the SJVAB have been quantified and compared to SJVAPCD annual significance thresholds (Table 3.3-7).

Table 3.3-7. Program Construction Exhaust and Fugitive Dust Emissions within the SJVAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Annual Unmitigated Emissions (tons/year)					
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Total	PM2.5 Total
Offsite truck trips	0.28	9.71	1.50	0.02	0.32	0.24
Total emissions	0.28	9.71	1.50	0.02	0.32	0.24
SJVAPCD significance threshold	10	10	NA	NA	15	15
Significant impact?	No	No	No	No	No	No

Criteria pollutant emissions of ROG, NO_X, CO, SO_2, PM10, and PM2.5 from construction equipment would incrementally add to the regional atmospheric loading of these pollutants during construction of the various projects under the program. The maximum daily unmitigated construction-related exhaust emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-8. As discussed above under *Methods for Analysis*, construction exhaust emissions were estimated using the California Emissions Estimator Model (CalEEMod) (South Coast Air Quality Management District 2011), the EPA Emissions Factors & AP 42 Compilation of Air Pollutant Emission Factors document (U.S. Environmental Protection Agency 1995a, 1995b, 1995c), and the ARB EMission FACtors (EMFAC) 2011 model (California Air Resources Board 2013c). Maximum daily emissions were calculated for the period of time where the greatest construction activity is anticipated to occur. This time period involves the overlap of construction phases including decommissioning and foundation removal, road construction, and turbine foundations and batch plant, along with offsite truck trips and offsite worker trips. Other non-overlapping construction phases contribute to average daily and average annual emissions, but they are not counted as contributing to the maximum daily emissions that occur when the phases listed above overlap.

Table 3.3-8. Program Construction Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Daily Unmitigated Emissions (pounds/day)							
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Decommissioning and foundation removal	17.02	142.72	53.05	0.19	4.98	7.19	4.94	0.32
Laydown, substations and switch yards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Road construction	16.01	135.03	59.27	0.19	4.80	46.34	4.75	14.66
Turbine foundations and batch plant[a]	26.74	226.40	96.79	0.31	7.94	24.84	7.82	20.16
Turbine delivery and installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utility collector line installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration and cleanup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite truck trips	6.12	124.94	31.85	0.39	3.13	1.20	2.88	0.44
Offsite worker trips	0.33	1.49	10.84	0.13	0.01	0.26	0.01	0.10
Total emissions	**66.22**	**630.59**	251.79	1.20	20.87	79.84	20.40	35.69
BAAQMD significance threshold	**54**	**54**	NA	NA	82	NA	54	NA
Significant Impact?	**Yes**	**Yes**	No	No	No	No	No	No

Note: Construction activity with zero emissions means that this activity is not anticipated to occur during the time period producing the maximum daily emissions for construction.

[a] Includes construction activities along with fugitive dust emissions from the concrete batch plants.

As indicated in Table 3.3-8, maximum daily unmitigated exhaust emissions of ROG and NO_X would exceed BAAQMD's significance thresholds, resulting in a significant impact. Implementation of Mitigation Measures AQ-2a and AQ-2b would reduce construction-related exhaust emissions. As indicated in Table 3.3-7, maximum annual unmitigated exhaust emissions of ROG or NO_X that would be generated in the SJVAB would not exceed SJVAPCD's significance thresholds, resulting in a less-than-significant impact. As noted above, although the SJVAB is downwind of the project site and some emissions that are emitted at the project site within the SFBAAB would likely drift into the SJVAB due to transport, these emissions were not quantified due to the high variability in wind patterns and local weather and other conditions that contribute to emission transport and it would be speculative to quantify the amount of project-related emissions that would transport into the SJVAB. Therefore, these emissions were not estimated nor compared to the SJVAPCD's thresholds.

In addition to exhaust emissions, emissions of fugitive dust also would be generated by program-related construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, and operation of the concrete batch plant and rock crusher. With regard to fugitive dust emissions, the BAAQMD Guidelines focus on implementation of dust control measures rather than comparing estimated levels of fugitive dust to quantitative significance thresholds. New and more comprehensive fugitive dust control measures have been identified by BAAQMD in its 2012 guidelines. Therefore, BAAQMD's new applicable recommended fugitive dust control measures, which are contained in Mitigation Measures AQ-2a and AQ-2b, would be implemented to reduce impacts associated with fugitive dust emissions to a less-than-significant level. Even though the BAAQMD Guidelines do not require the quantification of construction-related fugitive dust emissions, these emissions were estimated for construction activities for informational purposes and are presented in Table 3.3-8.

Individual project proponents also would be required to obtain permits from BAAQMD for the proposed construction-related operations of the concrete batch plant and the rock crusher. Fugitive sources associated with these facilities would include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. Permit stipulations would require the use of BACTs. Permit stipulations would likely focus on increasing moisture content of the materials and may require the use of water sprays, enclosures, and baghouse devices. Implementation of BAAQMD's BACTs for batch plants and crushing equipment would ensure that fugitive dust emissions impacts that would be associated with these facilities would be less than significant. As noted above, stationary source emissions from fuel combustion at the batch plants were not estimated due to lack of data. Although these emissions would likely be minor after BACTs are implemented, these emissions would contribute to those estimated in Tables 3.3-9 through 3.3-11.

Table 3.3-9. Program Operational Exhaust and Fugitive Dust Emissions for the SFBAAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Daily Unmitigated Emissions (pounds/day)							
Operational Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Offsite worker trips	0.03	0.13	0.96	0.01	0.00	0.03	0.00	0.01
Maintenance/operation	3.38	28.05	12.52	0.04	1.15	0.73	1.14	0.04
Total emissions	3.41	28.18	13.48	0.05	1.15	0.76	1.15	0.05
BAAQMD significance threshold	54	54	NA	NA	82	NA	54	NA
Significant impact?	No	No	No	No	No	No	No	No

Table 3.3-10. Program Operational Exhaust and Fugitive Dust Emissions for the SFBAAB—Maximum Annual Unmitigated Emissions

	Estimated Maximum Annual Unmitigated Emissions (tons/day)							
Operational Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Offsite worker trips	0.00	0.02	0.13	0.00	0.00	0.00	0.00	0.00
Maintenance/operation	0.08	0.59	0.42	0.00	0.04	0.00	0.04	0.00
Total emissions	0.08	0.61	0.54	0.00	0.04	0.01	0.04	0.00
BAAQMD significance threshold	10	10	NA	NA	15	NA	10	NA
Significant impact?	No	No	No	No	No	No	No	No

Table 3.3-11. Program Construction Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Mitigated Emissions

	Estimated Maximum Daily Mitigated Emissions (pounds/day)							
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Decommissioning and foundation removal	17.02	114.18	53.05	0.19	2.74	3.24	2.72	0.15
Laydown, substations and switch yards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Road construction	16.01	108.02	59.27	0.19	2.64	20.85	2.61	6.60
Turbine foundations and batch plant[a]	26.74	181.12	96.79	0.31	4.37	11.18	4.30	9.07
Turbine delivery and installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utility collector line installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration and cleanup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite truck trips	6.12	124.94	31.85	0.39	3.13	1.20	2.88	0.44
Offsite worker trips	0.33	1.49	10.84	0.13	0.01	0.26	0.01	0.10
Total emissions	**66.22**	**529.76**	251.79	1.20	12.89	36.73	12.52	16.36
BAAQMD significance threshold	**54**	**54**	NA	NA	82	NA	54	NA
Significant impact?	**Yes**	**Yes**	No	No	No	No	No	No

Note: Construction activity with zero emissions means that this activity is not anticipated to occur during the time period producing the maximum daily emissions for construction.

[a] Includes construction activities along with fugitive dust emissions from the concrete batch plants.

Operational Activities

In addition to construction-related emissions, the program would also result in operational-related emissions associated with turbine maintenance activities, substation operation, and worker trips to and from the program area. However, daily and annual emissions of criteria pollutants associated with operational activities are anticipated to be the same under the program as under existing condition; consequently, they would not result in a significant contribution to existing air quality violations. The maximum daily unmitigated operation-related emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-9; maximum annual unmitigated operation-related emissions are presented in Table 3.3-10.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

The project proponents will require all contractors to comply with the following requirements for all areas with active construction activities.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite will be covered.

- All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads will be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage will be provided for construction workers at all access points.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified visible emissions evaluator.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The air district's phone number will also be visible to ensure compliance with applicable regulations.

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

The project proponents will require all contractors to comply with the following requirements for all areas with active construction activities.

- All exposed surfaces will be watered at a frequency adequate to maintain minimum soil moisture of 12%. Moisture content can be verified by lab samples or moisture probe.
- All excavation, grading, and/or demolition activities will be suspended when average wind speeds exceed 20 mph.
- Wind breaks (e.g., trees, fences) will be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50% air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) will be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time will be limited. Activities will be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, will be washed off prior to leaving the site.
- Site accesses to a distance of 100 feet from the paved road will be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures will be installed to prevent silt runoff to public roadways from sites with a slope greater than 1%.

- The idling time of diesel powered construction equipment will be minimized to 2 minutes.
- The project will develop a plan demonstrating that the offroad equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20% NO_X reduction and 45% PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
- Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
- All construction equipment, diesel trucks, and generators will be equipped with BACT for emission reductions of NO_X and PM.
- All contractors will use equipment that meets ARB's most recent certification standard for offroad heavy duty diesel engines.

Implementation of Mitigation Measures AQ-2a and AQ-2b would ensure that impacts related to fugitive dust emissions in the SFBAAB would be less than significant. However, implementation of these measures would not reduce total ROG or NO_X emissions to a less-than-significant level (Table 3.3-11). This impact of total ROG and NO_X emissions would be significant and unavoidable.

Mitigation Measures AQ-2a and AQ-2b would not reduce the onroad emissions in the SJVAB shown in Table 3.3-7, but these emissions would not exceed SJVAPCD's significance thresholds and are, therefore, less than significant.

Impact AQ-2a-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation—program Alternative 2: 450 MW (significant and unavoidable)

Construction Activities

Construction of program Alternative 2 would occur over a period of approximately 4 years. It is estimated that there would be approximately 184 workdays per year that would involve the use of heavy construction equipment. Construction activities in the project area would include the same phases, construction equipment, and truck trips as Alternative 1. It was assumed that the daily construction activities for Alternative 2 would not differ from the daily construction activities for Alternative 1, although the period of construction would be slightly longer overall.

It is anticipated that the majority of equipment and material-related truck trips would originate at the Port of Stockton and in the city of Tracy and that the construction worker-related commute trips would occur entirely within the SFBAAB. The portion of the equipment, material, and aggregate haul trips that would originate at the Port of Stockton and in the city of Tracy would be generated in the SJVAB, which is under SJVAPCD's jurisdiction. Therefore, the heavy-duty truck trip exhaust emissions that would be generated in the SJVAB have been quantified and compared to SJVAPCD's annual significance thresholds (Table 3.3-7).

Criteria pollutant emissions of ROG, NO_X, CO, SO_2, PM10, and PM2.5 from construction equipment would incrementally add to the regional atmospheric loading of these pollutants during construction of program Alternative 2. The maximum daily unmitigated construction-related exhaust emissions that would occur in the SFBAAB are anticipated to be exactly the same as for alternative 1 and are presented in Table 3.3-8 above. This is because daily construction activity is anticipated to be the same for both alternatives. The only difference in emissions for these alternatives is total emissions over the course of the entire construction period, since Alternative 1 will be under construction for approximately 50 months and Alternative 2 will be under construction for approximately 54 months.

As discussed above, construction exhaust emissions were estimated using CalEEMod (South Coast Air Quality Management District 2011), the EPA Emissions Factors & AP 42 Compilation of Air Pollutant Emission Factors document (U.S. Environmental Protection Agency 1995a, 1995b, 1995c), and the ARB EMFAC 2011 model (California Air Resources Board 2013c). This time period involves the overlap of construction phases including decommissioning and foundation removal, road construction, and turbine foundations and batch plant, along with offsite truck trips and offsite worker trips. Other non-overlapping construction phases contribute to average daily and average annual emissions, but they are not counted as contributing to the maximum daily emissions that occur when the phases listed above overlap.

As indicated in Table 3.3-8 above, maximum daily unmitigated exhaust emissions of ROG and NO_X would exceed BAAQMD's significance threshold, resulting in a significant impact. Implementation of Mitigation Measures AQ-2a and AQ-2b would reduce construction-related exhaust emissions. As indicated in Table 3.3-7 above, maximum annual unmitigated exhaust emissions of ROG or NO_X that would be generated in the SJVAB would not exceed SJVAPCD's significance threshold, resulting in a less than significant impact. As noted above, although the SJVAB is downwind of the program area and some emissions that are emitted in the program area within the SFBAAB would likely drift into the SJVAB due to transport, these emissions were not quantified due to the high variability in wind patterns and local weather and other conditions that contribute to emission transport and it would be speculative to quantify the amount of project-related emissions that would transport into the SJVAB. Therefore, these emissions were not estimated nor compared to the SJVAPCD's thresholds. Implementation of Mitigation Measures AQ-2a and AQ-2b would, however, reduce construction-related exhaust emissions in the SJVAB.

In addition to exhaust emissions, emissions of fugitive dust also would be generated by project-related construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, and operation of the concrete batch plant and rock crusher. As noted above, BAAQMD's new applicable recommended fugitive dust control measures, which are contained in Mitigation Measures AQ-2a and AQ-2b, would be implemented to reduce impacts associated with fugitive dust emissions to a less-than-significant level. Even though the BAAQMD Guidelines do not require the quantification of construction-related fugitive dust emissions, these emissions were estimated for construction activities for informational purposes and are presented in Table 3.3-8.

Project proponents also would be required to obtain permits from BAAQMD for the proposed construction-related operations of the concrete batch plant and the rock crusher. Fugitive sources associated with these facilities would include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. Permit stipulations would require the use of BACTs. Permit stipulations would likely focus on increasing moisture content of the materials and may require the use of water sprays, enclosures, and baghouse devices. Implementation of BAAQMD's BACTs for batch plants and crushing equipment would ensure that fugitive dust emissions impacts that would be associated with these facilities would be less than significant. As noted above, stationary source emissions from fuel combustion at the batch plants were not estimated due to lack of data. Although these emissions would likely be minor after BACTs are implemented, these emissions would contribute to those estimated in Tables 3.3-9 through 3.3-11 above.

Operational Activities

In addition to construction-related emissions, the proposed project would also result in operational-related emissions associated with turbine maintenance activities, substation operation, and worker trips to and from the project area. However, daily and annual emissions of criteria pollutants associated with operational activities are anticipated to be unchanged under the proposed project and would not be considered to result in a significant contribution to existing air quality violations. The maximum daily unmitigated operation-related emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-9 above; maximum annual unmitigated operation-related emissions are presented in Table 3.3-11 above.

Implementation of Mitigation Measures AQ-2a and AQ-2b would ensure that impacts related to fugitive dust emissions in the SFBAAB would be less than significant. However, implementation of these mitigation measures would not reduce total NO_X emissions to a less-than-significance level (Table 3.3-11). This impact of total NO_X emissions would be significant and unavoidable.

Mitigation Measures AQ-2a and AQ-2b would not reduce the onroad emissions shown in Table 3.3-7, but these emissions would not exceed SJVAPCD's significance threshold and are therefore less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-2b: Violate any air quality standard or contribute substantially to an existing or projected air quality violation—Golden Hills Project (significant and unavoidable)

Construction Activities

Construction of the Golden Hills Project would occur over a period of approximately 9 months. It is estimated that there would be approximately 184 workdays that would involve the use of heavy construction equipment. Construction activities in the project area would include the same phases, construction equipment, and truck trips as the program.

It is anticipated that the majority of equipment and material-related truck trips would originate at the Port of Stockton and in the city of Tracy and that the construction worker-related commute trips would occur entirely within the SFBAAB. The portion of the equipment, material, and aggregate haul trips that would originate at the Port of Stockton and in the city of Tracy would be generated in the SJVAB, which is under SJVAPCD's jurisdiction. Therefore, the heavy-duty truck trip exhaust emissions that would be generated in the SJVAB have been quantified and compared to SJVAPCD's annual significance thresholds (Table 3.3-12).

Table 3.3-12. Golden Hills Construction Exhaust and Fugitive Dust Emissions within the SJVAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Annual Unmitigated Emissions (tons/year)					
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Total	PM2.5 Total
Offsite truck trips	0.23	7.91	1.22	0.01	0.26	0.20
Total emissions	0.23	7.91	1.22	0.01	0.26	0.20
SJVAPCD significance threshold	10	10	NA	NA	15	15
Significant impact?	No	No	No	No	No	No

Criteria pollutant emissions of ROG, NO_X, CO, SO_2, PM10, and PM2.5 from construction equipment would incrementally add to the regional atmospheric loading of these pollutants during construction of the Golden Hills Project. The maximum daily unmitigated construction-related exhaust emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-13. As discussed above, construction exhaust emissions were estimated using CalEEMod (South Coast Air Quality Management District 2011), the EPA Emissions Factors & AP 42 Compilation of Air Pollutant Emission Factors document (U.S. Environmental Protection Agency 1995a, 1995b, 1995c), and the ARB EMFAC 2011 model (California Air Resources Board 2013c). This time period involves the overlap of construction phases including decommissioning and foundation removal, road construction, and turbine foundations and batch plant, along with offsite truck trips and offsite worker trips. Other non-overlapping construction phases contribute to average daily and average annual emissions, but they are not counted as contributing to the maximum daily emissions that occur when the phases listed above overlap.

Table 3.3-13. Golden Hills Construction Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Daily Unmitigated Emissions (pounds/day)							
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Decommissioning and foundation removal	13.87	116.32	43.23	0.16	4.06	5.86	4.02	0.26
Laydown, substations and switch yards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Road construction	13.05	110.05	48.31	0.15	3.92	37.77	3.87	11.94
Turbine foundations and batch plant[a]	21.79	184.52	78.88	0.26	6.47	20.25	6.38	16.43
Turbine delivery and installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utility collector line installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration and cleanup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite truck trips	4.98	101.83	25.96	0.31	2.55	0.98	2.35	0.36
Offsite worker trips	0.27	1.22	8.83	0.10	0.01	0.21	0.01	0.09
Total emissions	53.97	**513.93**	205.21	0.98	17.01	65.07	16.63	29.09

Construction Activity	Estimated Maximum Daily Unmitigated Emissions (pounds/day)						
BAAQMD significance threshold	54	**54**	NA	NA	82	NA	54	NA
Significant impact?	No	**Yes**	No	No	No	No	No	No

Note: Construction activity with zero emissions means that this activity is not anticipated to occur during the time period producing the maximum daily emissions for construction.

[a] Includes construction activities along with fugitive dust emissions from the concrete batch plants.

As indicated in Table 3.3-13, maximum daily unmitigated exhaust emissions of NO_X would exceed BAAQMD's significance threshold, resulting in a significant impact. Implementation of Mitigation Measures AQ-2a and AQ-2b would reduce construction-related exhaust emissions. As indicated in Table 3.3-12, maximum annual unmitigated exhaust emissions of ROG or NO_X that would be generated in the SJVAB would not exceed SJVAPCD's significance threshold, resulting in a less than significant impact. As noted above, although the SJVAB is downwind of the project site and some emissions that are emitted at the project site within the SFBAAB would likely drift into the SJVAB due to transport, these emissions were not quantified due to the high variability in wind patterns and local weather and other conditions that contribute to emission transport and it would be speculative to quantify the amount of project-related emissions that would transport into the SJVAB. Therefore, these emissions were not estimated nor compared to the SJVAPCD's thresholds. Implementation of Mitigation Measures AQ-2a and AQ-2b would, however, reduce construction-related exhaust emissions in the SJVAB.

In addition to exhaust emissions, emissions of fugitive dust also would be generated by project-related construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, and operation of the concrete batch plant and rock crusher. As noted above, BAAQMD's new applicable recommended fugitive dust control measures, which are contained in Mitigation Measures AQ-2a and AQ-2b, would be implemented to reduce impacts associated with fugitive dust emissions to a less-than-significant level. Even though the BAAQMD Guidelines do not require the quantification of construction-related fugitive dust emissions, these emissions were estimated for construction activities for informational purposes and are presented in Table 3.3-13.

Project proponents also would be required to obtain permits from BAAQMD for the proposed construction-related operations of the concrete batch plant and the rock crusher. Fugitive sources associated with these facilities would include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. Permit stipulations would require the use of BACTs. Permit stipulations would likely focus on increasing moisture content of the materials and may require the use of water sprays, enclosures, and baghouse devices. Implementation of BAAQMD's BACTs for batch plants and crushing equipment would ensure that fugitive dust emissions impacts that would be associated with these facilities would be less than significant. As noted above, stationary source emissions from fuel combustion at the batch plants were not estimated due to lack of data. Although these emissions would likely be minor after BACTs are implemented, these emissions would contribute to those estimated in Tables 3.3-14 through 3.3-16.

Table 3.3-14. Golden Hills Operational Exhaust and Fugitive Dust Emissions for the SFBAAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Daily Unmitigated Emissions (pounds/day)							
Operational Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Offsite worker trips	0.02	0.11	0.78	0.01	0.00	0.02	0.00	0.01
Maintenance/operation	2.76	22.86	10.21	0.03	0.94	0.60	0.93	0.03
Total emissions	2.78	22.97	10.99	0.04	0.94	0.62	0.93	0.04
BAAQMD significance threshold	54	54	NA	NA	82	NA	54	NA
Significant impact?	No	No	No	No	No	No	No	No

Table 3.3-15. Golden Hills Operational Exhaust and Fugitive Dust Emissions for the SFBAAB—Maximum Annual Unmitigated Emissions

	Estimated Maximum Annual Unmitigated Emissions (tons/day)							
Operational Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Offsite worker trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00
Maintenance/operation	0.07	0.48	0.34	0.00	0.03	0.00	0.03	0.00
Total emissions	0.07	0.50	0.44	0.00	0.03	0.01	0.03	0.00
BAAQMD significance threshold	10	10	NA	NA	15	NA	10	NA
Significant impact?	No	No	No	No	No	No	No	No

Table 3.3-16. Golden Hills Program Construction Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Mitigated Emissions

	Estimated Maximum Daily Mitigated Emissions (pounds/day)							
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Decommissioning and foundation removal	13.87	93.06	43.23	0.16	2.23	2.64	2.21	0.12
Laydown, substations and switch yards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Road construction	13.05	88.04	48.31	0.15	2.15	17.00	2.13	5.38
Turbine foundations and batch plant[a]	21.79	147.61	78.88	0.26	3.56	9.11	3.51	7.40
Turbine delivery and installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utility collector line installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration and cleanup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite truck trips	4.98	101.83	25.96	0.31	2.55	0.98	2.35	0.36
Offsite worker trips	0.27	1.22	8.83	0.10	0.01	0.21	0.01	0.09
Total emissions	53.97	**431.75**	205.21	0.98	10.51	29.94	10.21	13.33

Construction Activity	Estimated Maximum Daily Mitigated Emissions (pounds/day)							
BAAQMD significance threshold	54	**54**	NA	NA	82	NA	54	NA
Significant impact?	No	**Yes**	No	No	No	No	No	No

Note: Construction activity with zero emissions means that this activity is not anticipated to occur during the time period producing the maximum daily emissions for construction.

[a] Includes construction activities along with fugitive dust emissions from the concrete batch plants

Operational Activities

In addition to construction-related emissions, the proposed project would also result in operational-related emissions associated with turbine maintenance activities, substation operation, and worker trips to and from the project area. However, daily and annual emissions of criteria pollutants associated with operational activities are anticipated to be unchanged under the proposed project and would not be considered to result in a significant contribution to existing air quality violations. The maximum daily unmitigated operation-related emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-14; maximum annual unmitigated operation-related emissions are presented in Table 3.3-15.

Implementation of Mitigation Measures AQ-2a and AQ-2b would ensure that impacts related to fugitive dust emissions in the SFBAAB would be less than significant. However, implementation of these mitigation measures would not reduce total NO_X emissions to a less-than-significance level (Table 3.3-16). This impact of total NO_X emissions would be significant and unavoidable.

Mitigation Measures AQ-2a and AQ-2b would not reduce the onroad emissions shown in Table 3.3-12, but these emissions would not exceed SJVAPCD's significance threshold and are therefore less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-2c: Violate any air quality standard or contribute substantially to an existing or projected air quality violation—Patterson Pass Project (significant and unavoidable)

Construction Activities

Construction of the Patterson Pass Project would occur over a period of approximately 9 months. It is estimated that there would be approximately 184 workdays that would involve the use of heavy construction equipment. Construction activities in the project area would include the same phases, construction equipment, and truck trips as the program.

It is anticipated that the majority of equipment and material-related truck trips would originate at the Port of Stockton and in the city of Tracy and that the construction worker-related commute trips would occur entirely within the SFBAAB. The portion of the equipment, material, and aggregate haul trips that would originate at the Port of Stockton and in the city of Tracy would be generated in the

SJVAB, which is under SJVAPCD's jurisdiction. Therefore, the heavy-duty truck trip exhaust emissions that would be generated in the SJVAB have been quantified and compared to SJVAPCD's annual significance thresholds (Table 3.3-17).

Table 3.3-17. Patterson Pass Construction Exhaust and Fugitive Dust Emissions within the SJVAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Annual Unmitigated Emissions (tons/year)					
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Total	PM2.5 Total
Offsite truck trips	0.06	1.92	0.30	0.00	0.06	0.05
Total emissions	0.06	1.92	0.30	0.00	0.06	0.05
SJVAPCD significance threshold	10	10	NA	NA	15	15
Significant impact?	No	No	No	No	No	No

Criteria pollutant emissions of ROG, NO_X, CO, SO_2, PM10, and PM2.5 from construction equipment would incrementally add to the regional atmospheric loading of these pollutants during construction of the Patterson Pass Project. The maximum daily unmitigated construction-related exhaust emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-18. As discussed above, construction exhaust emissions were estimated using CalEEMod (South Coast Air Quality Management District 2011), the EPA Emissions Factors & AP 42 Compilation of Air Pollutant Emission Factors document (U.S. Environmental Protection Agency 1995a, 1995b, 1995c), and the ARB EMFAC 2011 model (California Air Resources Board 2013c). This time period involves the overlap of construction phases including decommissioning and foundation removal, road construction, and turbine foundations and batch plant, along with offsite truck trips and offsite worker trips. Other non-overlapping construction phases contribute to average daily and average annual emissions, but they are not counted as contributing to the maximum daily emissions that occur when the phases listed above overlap.

As indicated in Table 3.3-18, maximum daily unmitigated exhaust emissions of NO_X would exceed BAAQMD's significance threshold, resulting in a significant impact. Implementation of Mitigation Measures AQ-2a and AQ-2b would reduce construction-related exhaust emissions. As indicated in Table 3.3-17, maximum annual unmitigated exhaust emissions of ROG or NO_X that would be generated in the SJVAB would not exceed SJVAPCD's significance thresholds, resulting in a less-than-significant impact. Implementation of Mitigation Measures AQ-2a and AQ-2b would, however, reduce construction-related exhaust emissions in the SJVAB. As noted above, although the SJVAB is downwind of the project site and some emissions that are emitted at the project site within the SFBAAB may drift into the SJVAB due to transport, these emissions were not quantified due to the high variability in wind patterns and local weather and other conditions that contribute to emission transport and it would be speculative to quantify the amount of project-related emissions that would transport into the SJVAB. Therefore, these emissions were not estimated nor compared to the SJVAPCD's thresholds.

Table 3.3-18. Patterson Pass Construction Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Daily Unmitigated Emissions (pounds/day)							
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Decommissioning and foundation removal	3.37	28.26	10.50	0.04	0.99	1.42	0.98	0.06
Laydown, substations and switch yards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Road construction	3.17	26.74	11.74	0.04	0.95	9.18	0.94	2.90
Turbine foundations and batch plant[a]	5.29	44.83	19.16	0.06	1.57	4.92	1.55	3.99
Turbine delivery and installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utility collector line installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration and cleanup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite truck trips	1.21	24.74	6.31	0.08	0.62	0.24	0.57	0.09
Offsite worker trips	0.06	0.30	2.15	0.02	0.00	0.05	0.00	0.02
Total emissions	13.11	**124.86**	49.86	0.24	4.13	15.81	4.04	7.07
BAAQMD significance threshold	54	**54**	NA	NA	82	NA	54	NA
Significant impact?	No	**Yes**	No	No	No	No	No	No

Note: Construction activity with zero emissions means that this activity is not anticipated to occur during the time period producing the maximum daily emissions for construction.

[a] Includes construction activities along with fugitive dust emissions from the concrete batch plants.

In addition to exhaust emissions, emissions of fugitive dust also would be generated by project-related construction activities associated with grading and earth disturbance, travel on paved and unpaved roads, and operation of the concrete batch plant and rock crusher. As noted above, BAAQMD's new applicable recommended fugitive dust control measures, which are contained in Mitigation Measures AQ-2a and AQ-2b, would be implemented to reduce impacts associated with fugitive dust emissions to a less-than-significant level. Even though the BAAQMD Guidelines do not require the quantification of construction-related fugitive dust emissions, these emissions were estimated for construction activities for informational purposes and are presented in Table 3.3-18.

The project proponent also would be required to obtain permits from BAAQMD for the proposed construction-related operations of the concrete batch plant and the rock crusher. Fugitive sources associated with these facilities would include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. Permit stipulations would require the use of BACTs. Permit stipulations would likely focus on increasing moisture content of the materials and may require the use of water sprays, enclosures, and baghouse devices. Implementation of BAAQMD's BACTs for batch plants and crushing equipment would ensure that fugitive dust emissions impacts that would be associated with these facilities would be less than significant. As noted above, stationary source emissions from fuel combustion at the batch plants were not estimated due to lack of data. Although these emissions would likely be minor after BACTs are implemented, these emissions would contribute to those estimated in Tables 3.3-19 through 3.3-21.

Table 3.3-19. Patterson Pass Operational Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Unmitigated Emissions

	Estimated Maximum Daily Unmitigated Emissions (pounds/day)							
Operational Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Offsite worker trips	0.01	0.03	0.19	0.00	0.00	0.01	0.00	0.00
Maintenance/operation	0.67	5.55	2.48	0.01	0.23	0.14	0.23	0.01
Total emissions	0.68	5.58	2.67	0.01	0.23	0.15	0.23	0.01
BAAQMD significance threshold	54	54	NA	NA	82	NA	54	NA
Significant impact?	No	No	No	No	No	No	No	No

Table 3.3-20. Patterson Pass Operational Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Annual Unmitigated Emissions

	Estimated Maximum Annual Unmitigated Emissions (tons/day)							
Operational Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Offsite worker trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Maintenance/operation	0.02	0.12	0.08	0.00	0.01	0.00	0.01	0.00
Total emissions	0.02	0.12	0.11	0.00	0.01	0.00	0.01	0.00
BAAQMD significance threshold	10	10	NA	NA	15	NA	10	NA
Significant impact?	No	No	No	No	No	No	No	No

Table 3.3-21. Patterson Pass Construction Exhaust and Fugitive Dust Emissions within the SFBAAB—Maximum Daily Mitigated Emissions

	Estimated Maximum Daily Mitigated Emissions (pounds/day)							
Construction Activity	ROG	NO_X	CO	SO_2	PM10 Exhaust	PM10 Dust	PM2.5 Exhaust	PM2.5 Dust
Decommissioning and foundation removal	3.37	22.61	10.50	0.04	0.54	0.64	0.54	0.03
Laydown, substations and switch yards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Road construction	3.17	21.39	11.74	0.04	0.52	4.13	0.52	1.31
Turbine foundations and batch plant[a]	5.29	35.86	19.16	0.06	0.86	2.21	0.85	1.80
Turbine delivery and installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utility collector line installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restoration and cleanup	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite truck trips	1.21	24.74	6.31	0.08	0.62	0.24	0.57	0.09
Offsite worker trips	0.06	0.30	2.15	0.02	0.00	0.05	0.00	0.02
Total emissions	13.11	**104.89**	49.86	0.24	2.55	7.27	2.48	3.24

Construction Activity	Estimated Maximum Daily Mitigated Emissions (pounds/day)							
BAAQMD significance threshold	54	**54**	NA	NA	82	NA	54	NA
Significant impact?	No	**Yes**	No	No	No	No	No	No

Note: Construction activity with zero emissions means that this activity is not anticipated to occur during the time period producing the maximum daily emissions for construction.

[a] Includes construction activities along with fugitive dust emissions from the concrete batch plants

Operational Activities

In addition to construction-related emissions, the proposed project would also result in operational-related emissions associated with turbine maintenance activities, substation operation, and worker trips to and from the project area. However, daily and annual emissions of criteria pollutants associated with operational activities are anticipated to be unchanged under the proposed project and would not be considered to result in a significant contribution to existing air quality violations. The maximum daily unmitigated operation-related emissions that would occur in the SFBAAB have been estimated and are presented in Table 3.3-19; maximum annual unmitigated operation-related emissions are presented in Table 3.3-20.

Implementation of Mitigation Measures AQ-2a and AQ-2b would ensure that impacts related to fugitive dust emissions in the SFBAAB would be less than significant. However, implementation of these measures would not reduce total NO_X emissions to a less-than-significance level (Table 3.3-21). The impact of total NO_X emissions would be significant and unavoidable.

Mitigation Measures AQ-2a and AQ-2b would not reduce the onroad emissions shown in Table 3.3-17, but these emissions would not exceed SJVAPCD's significance threshold and are, therefore, less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-3a-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)—program Alternative 1: 417 MW (significant and unavoidable for construction and less than significant for operation)

Operation of program Alternative 1 would not result in new permanent stationary sources of criteria pollutants, nor would it increase criteria pollutant emissions from any existing stationary sources. Depending on the construction activities underway during any given month, from 40 to 150 workers would be at the site during construction. No new permanent workers would be employed under the program. Drive-by inspections and scheduled wind turbine maintenance would continue to occur on a daily, weekly, or monthly basis and would be conducted by existing technicians and operations personnel. These activities would continue to be performed per the requirements of the equipment specifications and standard industry practice. Daily emissions of criteria pollutants associated with these activities are anticipated to be unchanged under the program and would not be considered to result in a significant contribution to existing air quality violations.

However, as noted above, projects that would result in an increase in ROG, NO_X, PM10, or PM2.5 of more than their respective project-level daily mass thresholds indicated in Table 3.3-5 would also be considered to contribute considerably to a significant cumulative impact. Because construction emissions of ROG and NO_X for Alternative 1 are greater than the BAAQMD thresholds after the implementation of Mitigation Measures AQ-2a and AQ-2b, (Table 3.3-11), construction impacts are significant and unavoidable.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-3a-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)—program Alternative 2: 450 MW (significant and unavoidable for construction and less than significant for operation)

Operation of program Alternative 2 would not result in new permanent stationary sources of criteria pollutants, nor would it increase criteria pollutant emissions from any existing stationary sources. No new permanent workers would be employed under the proposed project. Drive-by inspections and scheduled wind turbine maintenance would continue to occur on a daily, weekly, or monthly basis and would be conducted by existing technicians and operations personnel. These activities would continue to be performed per the requirements of the equipment specifications and standard industry practice. Daily emissions of criteria pollutants associated with these activities are anticipated to be unchanged under the proposed project and would not be considered to result in a significant contribution to existing air quality violations.

Because construction emissions of ROG and NO_X for Alternative 2 would be greater than the BAAQMD thresholds after the implementation of Mitigation Measures AQ-2a and AQ-2b, (Table 3.3-11), construction impacts would be significant and unavoidable.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-3b: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)—Golden Hills Project (significant and unavoidable for construction and less than significant for operation)

Operation of the Golden Hills Project would not result in new permanent stationary sources of criteria pollutants, nor would it increase criteria pollutant emissions from any existing stationary sources. No new permanent workers would be employed under the proposed project. Drive-by inspections and scheduled wind turbine maintenance would continue to occur on a daily, weekly, or monthly basis and would be conducted by existing technicians and operations personnel. These activities would continue to be performed per the requirements of the equipment specifications and standard industry practice. Daily emissions of criteria pollutants associated with these activities are anticipated to be unchanged under the proposed project and would not be considered to result in a significant contribution to existing air quality violations.

Because construction emissions of NO_X for the Golden Hills Project would be greater than the BAAQMD thresholds after the implementation of Mitigation Measures AQ-2a and AQ-2b, (Table 3.3-16), construction impacts would be significant and unavoidable.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-3c: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)—Patterson Pass Project (significant and unavoidable for construction and less than significant for operation)

Operation of the Patterson Pass Project would not result in new permanent stationary sources of criteria pollutants, nor would it increase criteria pollutant emissions from any existing stationary sources. No new permanent workers would be employed under the proposed project. Drive-by inspections and scheduled wind turbine maintenance would continue to occur on a daily, weekly, or monthly basis and would be conducted by existing technicians and operations personnel. These activities would continue to be performed per the requirements of the equipment specifications and standard industry practice. Daily emissions of criteria pollutants associated with these activities are anticipated to be unchanged under the proposed project and would not be considered to result in a significant contribution to existing air quality violations.

Because construction emissions of NO_X for the Patterson Pass Project would be greater than the BAAQMD thresholds after the implementation of Mitigation Measures AQ-2a and AQ-2b, (Table 3.3-21), construction impacts would be significant and unavoidable.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-4a-1: Expose sensitive receptors to substantial pollutant concentrations—program Alternative 1: 417 MW (less than significant with mitigation)

Long-term operations associated with the program would result in no new emissions. Construction activities would generate air pollutant emissions, including equipment exhaust emissions and suspended and inhalable PM. However, construction activities would occur over a relatively short period of approximately 4 years, and associated emissions would be spatially dispersed over the approximately 49,202-acre program area. In addition, the closest sensitive receptors to the program area are a community of single-family residences in the city of Livermore located approximately 4,500 feet to the west of the program area boundary and the Mountain House community of single-family residences, three elementary schools childcare facilities, and parks and open space areas, located approximately 5,000 feet to the east of the program area boundary. The emissions modeling shows that a majority of DPM exhaust emissions (PM10 and PM2.5) are associated with turbine foundations and batch plant and offsite truck trips. The cement batch plants, which represent a stationary source of emissions, would not likely be located at the program area boundary. As such, the distance from the batch plants to the nearest sensitive receptors would likely be greater than 4,500 feet. Regarding offsite truck trips, these would be transitory and would occur on multiple roads over a widespread area, thereby helping to disperse toxic pollutants and minimize exposure. Therefore, program-related construction emissions would be sufficiently diluted at the nearest sensitive receptor locations.

With implementation of Mitigation Measures AQ-2a and AQ-2b, which would reduce both criteria pollutants and toxic air contaminant emissions from construction equipment and reduce the potential health risks to sensitive receptors, this impact would be less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-4a-2: Expose sensitive receptors to substantial pollutant concentrations—program Alternative 2: 450 MW (less than significant with mitigation)

The impact of program Alternative 2 is the same as for program Alternative 1. Construction activities would occur over a relatively short period of approximately 4 years, and associated emissions would be spatially dispersed over the approximately 49,202-acre project area. With implementation of Mitigation Measures AQ-2a and AQ-2b, which would reduce both criteria pollutants and toxic air contaminant emissions from construction equipment and reduce the potential health risks to sensitive receptors, this impact would be less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-4b: Expose sensitive receptors to substantial pollutant concentrations—Golden Hills Project (less than significant with mitigation)

The impact for the Golden Hills Project is the same as for the program. Construction activities are anticipated to last for only 10 months, and associated emissions would be spatially dispersed over the approximately 4,584-acre project area. With implementation of Mitigation Measures AQ-2a and AQ-2b, which would reduce both criteria pollutants and toxic air contaminant emissions from construction equipment and reduce the potential health risks to sensitive receptors, this impact would be less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-4c: Expose sensitive receptors to substantial pollutant concentrations—Patterson Pass Project (less than significant with mitigation)

The impact for the Patterson Pass Project is the same as for the program. Construction activities are anticipated to last for only 10 months, and associated emissions would be spatially dispersed over the approximately 945-acre project area. With implementation of Mitigation Measures AQ-2a and AQ-2b, which would reduce both criteria pollutants and toxic air contaminant emissions from construction equipment and reduce the potential health risks to sensitive receptors, this impact would be less than significant.

Mitigation Measure AQ-2a: Reduce construction-related air pollutant emissions by implementing applicable BAAQMD Basic Construction Mitigation Measures

Mitigation Measure AQ-2b: Reduce construction-related air pollutant emissions by implementing measures based on BAAQMD's Additional Construction Mitigation Measures

Impact AQ-5a-1: Create objectionable odors affecting a substantial number of people—program Alternative 1: 417 MW (less than significant)

Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, animal feedlots, fiberglass manufacturing facilities, auto body shops, and rendering plants. The program would result in the development of new wind turbine generators that would not result in objectionable odors. Although program construction would involve the use of diesel equipment and a temporary batch plant that could result in the creation of odors, the construction activities would be temporary (approximately 5 years),spatially dispersed over the 49,202-acre program area, and would take place in areas that are not in the vicinity of sensitive receptors. Therefore, the program would not affect a substantial number of people.

This impact would be less than significant. No mitigation is required.

Impact AQ-5a-2: Create objectionable odors affecting a substantial number of people—program Alternative 2: 450 MW (less than significant)

The impact for program Alternative 2 is the same as for program Alternative 1. Although project construction would involve the use of diesel equipment and a temporary batch plant that could result in the creation of odors, the construction activities would be temporary (approximately 4 years), spatially dispersed over the 49,202-acre project area, and would take place in areas that are not in the vicinity of sensitive receptors. Therefore, the proposed project would not affect a substantial number of people.

This impact would be less than significant. No mitigation is required.

Impact AQ-5b: Create objectionable odors affecting a substantial number of people—Golden Hills Project (less than significant)

The impact for the Golden Hills Project is the same as for the program. Although project construction would involve the use of diesel equipment and a temporary batch plant that could result in the creation of odors, the construction activities would be temporary (approximately 10 months), spatially dispersed over the 4,584-acre project area, and would take place in areas that are not in the vicinity of sensitive receptors. Therefore, the proposed project would not affect a substantial number of people.

This impact would be less than significant. No mitigation is required.

Impact AQ-5c: Create objectionable odors affecting a substantial number of people—Patterson Pass Project (less than significant)

The impact for the Patterson Pass Project is the same as for the program. Although project construction would involve the use of diesel equipment and a temporary batch plant that could result in the creation of odors, the construction activities would be temporary (approximately 10 months), spatially dispersed over the 945-acre project area, and would take place in areas that are not in the vicinity of sensitive receptors. Therefore, the proposed project would not affect a substantial number of people.

This impact would be less than significant. No mitigation is required.

Cumulative Analysis

Cumulative impacts related to air quality are addressed in Impacts AQ-3a-1, AQ-3a-2, AQ-3b, and AQ-3c. Impacts would be significant and unavoidable for construction and less than significant for operation.

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Personal Communications

Kirk, Alison. Senior Environmental Planner, Bay Area Air Quality Management District, Planning and Research Division. August 31, 2011—email describing the intent of the BAAQMD daily construction emissions thresholds.

Siong, Patia. Air Quality Planner, San Joaquin Valley Unified Air Pollution Control District. May 23, 2011—email to Shannon Hatcher regarding construction thresholds.