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 Initial and Full Repower phases and mitigation for significant impacts where feasible and appropriate.

3.3.1 Existing Conditions

Regulatory Setting

Air pollutants are regulated at the federal, state, and air basin level; each agency has a different level of regulatory responsibility. The EPA regulates at the federal level. The California Air Resources Board (ARB) regulates at the state level. The Bay Area Air Quality Management District (BAAQMD) regulates at the air basin level.

This section summarizes federal, state, and local regulations that apply to air quality.

Federal and State Regulations

Federal Regulations

EPA is responsible for federal and interstate air pollution issues and policies. EPA sets federal (national) vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIPs), provides research and guidance for air pollution programs, and sets national ambient air quality standards, also known as federal standards. There are federal standards for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act of 1970. The criteria pollutants are ozone, nitrogen dioxide (NO_2), lead, particulate matter less than 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), carbon monoxide (CO), and sulfur dioxide (SO_2). The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality determined necessary, with an adequate margin of safety, to protect the public health.

A SIP is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The SIP for California is administered by the ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California's SIP incorporates individual federal attainment plans for regional air districts—each air district prepares its federal attainment plan, and sends it to the ARB to be approved and incorporated into the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

The ARB also administers California Ambient Air Quality Standards (state standards) for the 10 air pollutants designated in the California Clean Air Act. In addition to the six federal standards listed above, the state standards include visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The federal and state standards, relevant effects, properties, and sources of the pollutants are summarized in Table 3.3-1.

Table 3.3-1. Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Ozone	1 Hour	0.09 ppm	–	Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage.	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), NO_x, and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO_x) are mobile sources (on-road and off-road vehicle exhaust).
	8 Hour	0.070 ppm	0.075 ppm			
Carbon monoxide (CO)	1 Hour	20 ppm	35 ppm	Ranges depending on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death.	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.
	8 Hour	9.0 ppm	9 ppm			
Nitrogen dioxide[b] (NO_2)	1 Hour	0.18 ppm	0.100 ppm	Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contribution to atmospheric discoloration; increased visits to hospital for respiratory illnesses.	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides - NO_x (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). NOx is a precursor to ozone, PM10, and PM2.5 formation. NO_x can react with compounds to form nitric acid and related small particles and result in PM related health effects.	NO_x is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. NO_2 forms quickly from NO_x emissions. NO_2 concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.
	Annual	0.030 ppm	0.053 ppm			

Air Pollutant	Averaging Time	California Standard	National Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfur dioxide[c] (SO_2)	1 Hour	0.25 ppm	0.075 ppm	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	SO_2 is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO_x) include SO_2 and sulfur trioxide. Sulfuric acid is formed from SO_2, which can lead to acid deposition and can harm natural resources and materials. Although SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because SO_2 is a precursor to sulfate and PM10.	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of SO_2. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. SO_2 is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The SO_2 levels in the State are well below the maximum standards.
	3 Hour	–	0.5 ppm			
	24 Hour	0.04 ppm	0.14 (for certain areas)			
	Annual	–	0.030 ppm (for certain areas)			
Particulate matter (PM10)	24 hour	50 µg/m^3	150 µg/m^3	Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravate existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.	Suspended PM is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM10 refers to PM that is between 2.5 and 10 microns in diameter, (1 micron is one-millionth of a meter). PM2.5 refers to PM that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair.	Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere.
	Mean	20 µg/m^3	–			
Particulate matter (PM2.5)	24 Hour	–	35 µg/m^3			
	Annual	12 µg/m^3	12.0 µg/m^3			
Visibility-reducing particles	8 Hour	See note below[d]				
Sulfates	24 Hour	25 µg/m^3	–	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.	The sulfate ion is a polyatomic anion with the empirical formula SO_4^{2-}. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of SO_2. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.

Air Pollutant	Averaging Time	California Standard	National Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Lead[e]	30-day	1.5 µg/m^3	–	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs.	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.
	Quarter	–	1.5 µg/m^3			
	Rolling 3-month average	–	0.15 µg/m^3			
Vinyl chloride[e]	24 Hour	0.01 ppm	–	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a TAC and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.
Hydrogen sulfide	1 Hour	0.03 ppm	–	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Hydrogen sulfide (H_2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal).

Air Pollutant	Averaging Time	California Standard	National Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Volatile organic compounds (VOC)		There are no State or federal standards for VOCs because they are not classified as criteria pollutants.		Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as TAC.	Reactive organic gases (ROGs), or VOCs, are defined as any compound of carbon—excluding CO, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably.	Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM10 and lower visibility.

Source of effects, properties, and sources: South Coast Air Quality Management District 2007; California Environmental Protection Agency 2002; California Air Resources Board 2009; U.S. Environmental Protection Agency 2003, 2009a, 2009b, 2010, and 2012; National Toxicology Program 2011a and 2011b.

ppm = parts per million (concentration).
$\mu g/m^3$ = micrograms per cubic meter.
Annual = Annual Arithmetic Mean.
30-day = 30-day average.
Quarter = Calendar quarter.

[a] Federal standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3 Hour SO_2, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[b] To attain the 1-hour NO_2 national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (0.100 ppm).

[c] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[d] Visibility reducing particles: In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[e] The ARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

In 1998, following a 10-year scientific assessment process, the ARB identified PM from diesel-fueled engines—commonly called diesel particulate matter (DPM)—as a toxic air contaminant (TAC). Compared to other air toxics ARB has identified, DPM emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000).

Asbestos is listed as a TAC by ARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in surface deposits of several types of rock formations. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Crushing or breaking these rocks, through construction or other means, can release asbestoform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease depends on the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. There is no naturally occurring asbestos in the immediate project area (U.S. Geological Survey 2011).

State Regulations

This section describes the various regulations enacted at the statewide level. At the statewide level, the ARB has primary responsibility for air quality regulation development and enforcement.

Carl Moyer Memorial Air Quality Standards Attainment Program. Since 1998, the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) has provided funding to encourage the voluntary purchase of cleaner engines, equipment, and emission reduction technologies. The Carl Moyer Program plays a complementary role to California's regulatory program by funding emission reductions that are surplus, i.e., early and/or in excess of what is required by regulation. The Carl Moyer Program accelerates the turnover of old highly polluting engines, speeds the commercialization of advanced emission controls, and reduces air pollution impacts on environmental justice communities. Emission reductions achieved through the Carl Moyer Program are an important component of the California SIP.

ARB Airborne Toxic Control Measure (ATCM) for Diesel Particulate Matter from Portable Engines Rated at 50 horsepower and Greater. Effective February 19, 2011, each fleet is required to comply with weighted reduced PM emission fleet averages by the compliance dates listed in the regulation.

ARB ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling. Adopts section 2485 within Chapter 10, Article 1, Division 3, CCR Title 13 . The measure limits the idling of diesel vehicles to reduce emissions of toxics and criteria pollutants. The driver of any vehicle subject to this section: (1) shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location; and (2) shall not idle a diesel- fueled auxiliary power system for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

ARB Final Regulation Order, Requirements to Reduce Idling Emissions from New and In-Use Trucks. Requires that new 2008 and subsequent model-year heavy-duty diesel engines be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to neutral or park, and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system

will shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to neutral or park. Any trucks manufactured after 2008 and used during construction phases would be consistent with this rule, which would ultimately reduce air emissions.

ARB Regulation for In-Use Off-Road Diesel Vehicles. On July 26, 2007, ARB adopted a regulation to reduce DPM and NOx emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than 5 consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. The ARB is enforcing that part of the rule with fines up to $10,000 per day for each vehicle in violation. Performance requirements of the rule are based on a fleet's average NOx emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501–5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

Statewide Truck and Bus Rule. On December 12, 2008, ARB approved a new regulation to significantly reduce emissions from existing on-road diesel vehicles operating in California. The regulation requires affected trucks and buses to meet performance requirements between 2011 and 2023. By January 1, 2023, all vehicles must have a 2010 model year engine or equivalent. The regulation applies to all on-road heavy-duty diesel-fueled vehicles with a gross vehicle weight rating greater than 14,000 pounds, agricultural yard trucks with off-road certified engines, and certain diesel fueled shuttle vehicles of any gross vehicle weight rating. Out-of-state trucks and buses that operate in California are also subject to the regulation.

ARB Asbestos ATCM for Construction, Grading, Quarrying and Surface Mining Operations. In July 2002, ARB approved an ATCM for construction, grading, quarrying and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of best management practices to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities. The measure establishes specific testing, notification and engineering controls prior to grading, quarrying or surface mining in construction zones where naturally occurring asbestos is located on projects of any size. There are additional notification and engineering controls at work sites larger than 1 acre. These projects require the submittal of a Dust Mitigation Plan and approval by the air district prior to the start of a project.

Local Regulations

Bay Area Air Quality Management District

The project area is within the jurisdiction of BAAQMD. BAAQMD is responsible for controlling emissions primarily from stationary sources and maintains air quality monitoring stations throughout the San Francisco Bay Area Air Basin (Air Basin), which consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties; the western portion of Solano County; and the southern portion of Sonoma County. BAAQMD, in coordination with Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG), is also responsible for developing, updating, and implementing the Bay Area Clean Air Plan for the Basin. A clean air plan is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or state standards. The term nonattainment area is used to refer to an air basin where one or more ambient air quality standards are exceeded. The clean air plan, once submitted to and approved by ARB, becomes an integral part of the SIP.

Current Air Quality Plans

A SIP is a federal requirement; each state prepares one to describe existing air quality conditions and measures that will be followed to attain and maintain the national ambient air quality standards. In addition in California, state ozone standards have planning requirements. However, state PM10 standards have no attainment planning requirements, but air districts must demonstrate that all measures feasible for the area have been adopted.

Ozone Plans

Because the Air Basin is nonattainment for the federal and state ozone standards, BAAQMD prepared an Ozone Attainment Demonstration Plan to satisfy the federal 1-hour ozone planning requirement and a Clean Air Plan to satisfy the state 1-hour ozone planning requirement. The EPA revoked the 1-hour ozone standard and adopted an 8-hour ozone standard. BAAQMD will address the new federal 8-hour ozone planning requirements once they are established. On September 15, 2010, BAAQMD adopted the final Bay Area 2010 Clean Air Plan, and certified its final EIR. The 2010 Clean Air Plan was prepared by BAAQMD in cooperation with the Metropolitan Transportation Commission and ABAG. The 2010 Clean Air Plan builds from and incorporates components of the BAAQMD's 2005 Ozone Strategy, and identifies how the Air Basin will achieve compliance with the state 1-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The 2010 Clean Air Plan has the following purposes.

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement *all feasible measures* to reduce ozone.
- Provide a control strategy to reduce ozone, PM, air toxics, and greenhouse gases (GHGs) in a single, integrated plan.
- Review progress in improving air quality in recent years.
- Establish emission control measures to be adopted or implemented in the 2010 to 2012 timeframe.

Particulate Matter Plans

The Air Basin is designated nonattainment for the state PM10 and PM2.5 standards, but it is currently in attainment for the federal PM10 standard. EPA lowered the 24-hour PM2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006, and designated the Air Basin as nonattainment for the new PM2.5 standard effective December 14, 2009.

On December 8, 2011, ARB submitted a *clean data finding* request to EPA on behalf of the Bay Area. EPA guidelines provide that the region can fulfill federal PM2.5 SIP requirements by preparing either a redesignation request and a PM2.5 maintenance plan, or a *clean data* SIP submittal. Because peak PM2.5 levels can vary from year to year based on natural, short-term changes in weather conditions, BAAQMD believes that it would be premature to submit a redesignation request and PM2.5 maintenance plan at this time. Therefore, BAAQMD prepared a *clean data* SIP to address the required elements, including the following.

- An emission inventory for primary PM2.5, as well as precursors to secondary PM formation.
- Amendments to the BAAQMD's New Source Review regulation to address PM2.5.

In January 2013, EPA determined that the Bay Area attains the 24-hour PM2.5 federal standard, suspending the PM2.5 SIP requirements. The PM2.5 attainment designation of the region will not change until BAAQMD decides to request a redesignation from EPA.

Rules

BAAQMD establishes and administers a program of rules and regulations that are air plans, as described above, to attain and maintain state and national air quality standards. The rules and regulations that apply to the Initial Repower and Full Repower include but are not limited to the following.

- **Regulation 2, Rule 2.** New Source Review. This rule requires any new source resulting in an increase of any criteria pollutant to be evaluated for adherence to Best Available Control Technology (BACT). For compression internal combustion engines, BACT requires that the generator be fired on *California Diesel Fuel* (fuel oil with a sulfur content less than 0.05% by weight and less than 20% by volume of aromatic hydrocarbons). All stationary internal combustion engines larger than 50 horsepower must obtain a Permit to Operate. If the engine is diesel fueled, then it must also comply with the BAAQMD- administered Statewide Air Toxics Control Measure for Stationary Diesel Engines.
- **Regulation 2, Rule 5.** New Source Review of Toxic Air Contaminants. This rule applies to preconstruction review of new and modified sources of TACs, contains project health risk limits, and requires Toxics BACT.
- **Regulation 8, Rule 3.** Architectural Coatings. This rule governs the manufacture, distribution, and sale of architectural coatings and limits the ROG content in paints and paint solvents. Although this rule does not directly apply to the Initial Repower or Full Repower, it does dictate the ROG content of paint available for use during construction.
- **Regulation 8, Rule 15.** Emulsified and Liquid Asphalts. Although this rule does not directly apply to the Initial Repower or Full Repower, it does dictate the ROG content of asphalt available for use during construction through regulating the sale and use of asphalt and limits the ROG content in asphalt.

BAAQMD manages a naturally occurring asbestos program that administers the requirements of ARB's Asbestos ATCM, as discussed above. BAAMQD provides an exemption application, notification form for road construction and maintenance operations, and asbestos dust mitigation plan applications for projects to submit prior to the start of construction, or upon discovery of asbestos, ultramafic rock, or serpentine during construction. Forms must be submitted to BAAQMD in accordance with the procedures detailed in the BAAQMD Asbestos ATCM Inspection Guidelines Policies and Procedures.

Alameda County General Plan—East County Area Plan

The East County Area Plan (ECAP), part of the Alameda County General Plan, was last revised in 2000 by the County's Measure D Initiative and 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). ECAP policies applicable to the proposed Sand Hill Wind Project include those listed below (Alameda County 2000:70–71).

Policies

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 Governments (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 that may significantly affect air quality.

Environmental Setting

This section provides a discussion of the existing conditions related to air quality in the project vicinity.

Local Climate

The project area is in the northeast corner of Alameda County and is generally deemed to be within the San Francisco Bay Area Air Basin, although the area borders on the Central Valley Air Basin. The Air Basin is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays. Elevations of 1,500 feet are common in the higher terrain of this area.

The Pacific High, a semi-permanent, high-pressure area centered over the northeastern Pacific Ocean dominates the summer climate of the west coast. Because this high-pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus, the conditions that persist along the coast of California during summer are a northwest airflow and negligible precipitation. A thermal low- pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

The steady northwesterly flow around the eastern edge of the Pacific High exerts stress on the ocean surface along the west coast. This induces upwelling of cold water from below. Upwelling produces a band of cold water off San Francisco that is approximately 80 miles wide. During July, the surface waters off San Francisco are 3 degrees Fahrenheit (°F) cooler than those off Vancouver, British Columbia, more than 900 miles to the north. Air approaching the California coast, already cool and moisture-laden from its long trajectory over the Pacific, is further cooled as it flows across this cold bank of water near the coast, thus accentuating the temperature contrast across the coastline. This cooling is often sufficient to produce condensation—a high incidence of fog and stratus clouds along the northern California coast in summer.

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the gap in the western Coast Ranges, known as the Golden Gate, and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly

winds accelerate considerably and come more from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate produces a jet that sweeps eastward but widens downstream, producing southwest winds at Berkeley and northwest winds at San Jose; a branch curves eastward through the Carquinez Strait and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Golden Gate, the Carquinez Strait, or San Bruno Gap. For example, the average wind speed at San Francisco International Airport from 3 a.m. to 4 p.m. in July is about 20 miles per hour (mph), compared with only about 8 mph at San Jose and less than 7 mph at the Farallon Islands.

The sea breeze between the coast and the Central Valley commences near the surface along the coast in late morning or early afternoon; it may first be observed only through the Golden Gate. Later in the day, the layer deepens and intensifies while spreading inland. As the breeze intensifies and deepens, it flows over the lower hills farther south along the peninsula. This process frequently can be observed as a bank of stratus clouds rolling over the coastal hills on the west side of the bay. The depth of the sea breeze depends in large part upon the height and strength of the inversion. The generally low elevation of this stable layer of air prevents marine air from flowing over the coastal hills. It is unusual for the summer sea breeze to flow over terrain exceeding 2,000 feet in elevation.

In winter, the Air Basin experiences periods of storminess, moderate-to-strong winds, and periods of stagnation with very light winds. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon, and otherwise light and variable winds.

A primary factor in air quality is the mixing depth (i.e., the vertical air column available for dilution of contaminant sources). Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This is caused by most of the sun's energy being converted to sensible heat at the ground, which, in turn, warms the air at the surface.

The warm air rises in the atmosphere, where it expands and cools. Sometimes, however, the temperature of air actually increases with height. This condition is known as temperature inversion, because the temperature profile of the atmosphere is inverted from its usual state. Over the Air Basin, the frequent occurrence of temperature inversions limits mixing depth and, consequently, limits the availability of air for dilution.

Local Air Quality

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature inversions interact with the physical features of the landscape to determine the movement and dispersal of air pollutant emissions and, consequently, their effect on air quality.

The local air quality near the project area can be evaluated by reviewing relevant air pollution concentrations within the Air Basin. BAAQMD operates several air monitoring stations within the Air Basin each measuring several different air pollutants. The closest BAAQMD air monitoring station to the project area is in the city of Livermore, approximately 10 miles west of the project area. Table 3.3-2 summarizes 2010 through 2012 air monitoring data published by ARB, which is the most recent time-period available. The Livermore monitoring station does not measure PM10 or CO. The nearest CO monitoring site is located in Fremont, approximately 24 miles southwest of the project area. The nearest PM10 monitoring site is operated by the San Joaquin Valley Air Pollution Control

District located within the San Joaquin Valley Air Basin in the city of Tracy, approximately 9.5 miles southeast of the project area. Although this monitoring site is closer to the project area than the Livermore monitoring site, the Livermore monitoring data is assumed to be more representative of the project area as it is located within the same air basin. The data shows that during the past few years, the project area has exceeded the state and/or federal ozone and PM2.5 ambient air quality standards.

Table 3.3-2. Air Quality Monitoring Summary

Air Pollutant, Location	Averaging Time	Item	2010	2011	2012
Ozone	1 Hour	Max 1 Hour (ppm)	0.150	0.115	0.102
		Days > State Standard (0.09 ppm)	3	3	2
	8 Hour	Max 8 Hour (ppm)	0.098	0.085	0.090
		Days > State Standard (0.07 ppm)	6	9	4
		Days > Federal Standard (0.075 ppm)	3	2	3
Carbon Monoxide (CO)	8 Hour	Max 8 Hour (ppm)	0.94	ID	ID
		Days > State Standard (9.0 ppm)	0	ID	ID
		Days > Federal Standard (9 ppm)	0	ID	ID
Nitrogen Dioxide (NO_2)	Annual	Annual Average (ppm)	0.011	0.011	ID
	1 Hour	Max 1 Hour (ppm)	0.058	0.057	0.043
		Days > State Standard (0.18 ppm)	0	0	0
Inhalable coarse particles (PM10)	Annual	Annual Average ($\mu g/m^3$)	11.9	17.5	21.0
	24 Hour	24 Hour ($\mu g/m^3$)	28.5	110.8	73.4
		Days > State Standard (50 $\mu g/m^3$)	ID	ID	ID
		Days > Federal Standard (150 $\mu g/m^3$)	0	0	0
Fine particulate matter (PM2.5)	Annual	Annual Average ($\mu g/m^3$)	7.6	ID	ID
	24 Hour	24 Hour ($\mu g/m^3$)	34.7	45.4	31.1
		Days > Federal Standard (35 $\mu g/m^3$)	0	2	0

Sources: California Air Resources Board 2013. Ozone, NO_2, and PM2.5 data from Livermore-793 Rincon Avenue Station. CO data from Fremont-Chapel Way Station. PM10 data from Tracy-Airport Station.
> = exceed.
ppm = parts per million.
$\mu g/m^3$ = micrograms per cubic meter.
ID = insufficient data.
ND = no data.
max = maximum.
State Standard = California Ambient Air Quality Standard.
Federal Standard = National Ambient Air Quality Standard.

Local Sources of Air Pollution

There are no permitted sources located within 1,000 feet of the project area boundaries. The nearest major roadway (as identified by BAAQMD) is I-580, within approximately 500 feet of the southern boundaries of project parcels APN 99B-7750-6-0 and APN 99B-6325-1-4 (Figure 2-2).

Sensitive Receptors

BAAQMD defines sensitive receptors to include residential dwellings including apartments, houses, and condominiums; schools, colleges, and universities; daycare centers and hospitals, and senior-care facilities. The nearest sensitive receptors consist of residences located approximately 1,000 feet north of project parcel APN 99B-7500-3-1 (Figure 2-2). The Initial and Full Repower would not locate any new sensitive receptors in the project area.

Attainment Status

EPA and ARB designate air basins where ambient air quality standards are exceeded as nonattainment areas. If standards are met, the area is designated as an attainment area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered unclassified. National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or *form* of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual PM2.5 standard is met if the 3-year average of the annual average PM2.5 concentration is less than or equal to the standard.

The current attainment designations for the Air Basin are shown in Table 3.3-3. The Air Basin is designated as nonattainment for the state and federal ozone, PM10, and PM2.5 standards.

Table 3.3-3. San Francisco Bay Area Air Basin Attainment Status

Pollutant	State Status	Federal Status
Ozone	Nonattainment	Nonattainment
CO	Attainment	Maintenance
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Nonattainment	Unclassified
PM2.5	Nonattainment	Nonattainment
Lead	Attainment	Attainment
Sulfates	Attainment	No federal standards
Hydrogen sulfide	Unclassified	
Visibility-reducing particles	Unclassified	

Source: Bay Area Air Quality Management District 2011a.

3.3.2 Environmental Impacts

Methods for Analysis

Air pollutant emissions can be estimated by using emission factors and a level of activity. Emission factors represent the rate of pollutant emission given an activity; for example, grams of NO_X per horsepower per hour or grams of NO_X per vehicle mile traveled. Activity levels would include the

horsepower of a piece of equipment or the miles traveled in a day. ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emission model and emission factors for off-road equipment and vehicles in the OFFROAD emission model.

The activity for off-road equipment is based on the horsepower and load factors of the equipment. In general, the horsepower is the power of an engine—the greater the horsepower, the greater the power. The load factor is the average power of a given piece of equipment while in operation compared to its maximum rated horsepower. A load factor of 1.0 indicates that a piece of equipment continuously operates at its maximum operating capacity. An air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

The California Emissions Estimator Model (CalEEMod) version 2011.1.1 was developed in cooperation with the South Coast Air Quality Management District and other air districts throughout the state. CalEEMod is designed as a uniform platform for government agencies, land use planners and environmental professionals to quantify potential criteria pollutant and greenhouse gas emissions associated with construction and operation from a variety of land uses.

Emission factors are often updated and there is a normal lag time between the development of new emission factors and their integration into the appropriate models. CalEEMod uses OFFROAD2007 and EMFAC2007 emission factors and will not be updated with the new OFFROAD2011 and EMFAC2011 factors until after the release of the technical report prepared for this analysis.

The discussion and analysis presented in this section based on the *Air Quality and Greenhouse Gas Analysis Report* for the Sand Hill Wind Project, which is provided in Appendix C, as well as additional analysis performed by ICF.

Construction

Initial Repower

Construction would consist of removal of existing turbines, pad construction, roadway improvements, and tower construction and installation. Construction would take place in 2014 and last approximately 6 months. The Initial Repower includes three construction areas located north and south of I-580 (Figure 2-2). Each set of parcels includes one or two common assembly pads (total of 5) and four 5-acre laydown areas that would be used to store turbine components, construction equipment, and construction materials. The common areas would be used to minimize soil disturbance during construction. Construction activities at all parcels are assumed to occur simultaneously. For the purposes of this analysis, these Initial Repower activities are categorized into two main phases of site preparation and tower construction. Detailed assumptions of these construction activities and durations are presented below.

Site Preparation Phasing

Site preparation would include activities such as pad construction, roadway improvements, and trenching. These activities were grouped into phases based on estimated construction and equipment schedules. Durations for the site preparation phases are shown in Table 3.3-4. Phase activities and durations were obtained from forecasted Initial Repower construction scheduling.

Table 3.3-4. Site Preparation Phase Durations and Activities

Phase	Activities	Duration (days)	Months
Site Preparation 1	Road and pad construction, compaction, dust control, trenching	65	1, 2, 3
Site Preparation 2	Hauling demolition and construction materials	85	1, 2, 3, 4
Site Preparation 3	Compaction, erosion, and dust control	130	1, 2, 3, 4, 5, 6

The construction equipment lists for the site preparation phases are shown in Table 3.3-5. Equipment and activity are based on the anticipated Initial Repower construction schedule. This analysis uses the equipment load factors presented in an ARB Staff Report updating the emission inventory for in-use off-road equipment (California Air Resources Board 2010).

Table 3.3-5. Site Preparation Equipment Assumptions

Activity	Equipment	Number	Hours per day	Horse-power	Load Factor
Site Preparation 1	Graders	2	12	162	0.41
	Plate Compactors	1	12	232	0.40
	Rollers	2	12	84	0.38
	Rubber Tired Dozers	3	12	358	0.40
	Tractors/Loaders/Backhoes	1	12	75	0.37
Site Preparation 2	Off-Highway Trucks (Water)	3	12	381	0.57
Site Preparation 3	Off-Highway Trucks (Water)	2	12	381	0.57

Offsite emissions would be generated by mobile sources related to worker, vendor, and hauling trips occurring during Initial Repower construction. CalEEMod default values for fleet mix, trip length, and trip generation rates were used to calculate emissions from worker and vendor trips. The haul trips include a total of 850 cement deliveries from local sources. This amounts to approximately 6 truck deliveries (round-trip) or 12 one-way trips per day during a peak day of activity. The hauling trips were added based on the forecasted Initial Repower construction schedule, with an assumed trip length of 10 miles. The phase trip generation rates used in this analysis are shown in Table 3.3-6.

Table 3.3-6. Site Preparation Offsite Trip Rate Assumptions

	Trips per day		
Activity	Worker	Vendor	Hauling
Site Preparation 1	23	0	12
Site Preparation 2	8	0	0
Site Preparation 3	5	0	0

Tower Construction Phasing

Site preparation would include activities such as pad construction, roadway improvements, and trenching. These activities were grouped into phases based on estimated construction and equipment schedules. Durations for the tower construction phases are shown in Table 3.3-7. Phase activities and durations were obtained from forecasted Initial Repower construction scheduling.

Table 3.3-7. Tower Construction Phase Durations and Activities

Phase	Activities	Duration (days)	Months
Site Preparation 1	Road and pad construction, compaction, dust control, trenching	65	1, 2, 3
Site Preparation 2	Hauling demolition and construction materials	85	1, 2, 3, 4
Site Preparation 3	Compaction, erosion, and dust control	130	1, 2, 3, 4, 5, 6
Tower Construction 1	Foundation construction, removal of existing foundation	65	1, 2, 3
Tower Construction 2	Removal of existing turbines, construction and installation of new turbines	130	1, 2, 3, 4, 5, 6
Tower Construction 3	Foundation pouring, construction and installation of new turbines	105	2, 3, 4, 5, 6

The construction equipment lists for these phases are shown in Table 3.3-8. Equipment and activity are based on the forecasted Initial Repower construction scheduling. Updated equipment load factors for off-road equipment were used in this analysis (California Air Resources Board 2010).

Table 3.3-8. Tower Construction Equipment Assumptions

Activity	Equipment	Number	Hours per day	Horse-power	Load Factor
Tower Construction 1	Excavators	2	12	157	0.38
Tower Construction 2	Cranes	2	12	200	0.29
	Forklifts	7	12	149	0.20
	Rubber Tired Loaders	2	12	87	0.36
Tower Construction 3	Cranes	1	12	287	0.29
	Excavators	2	12	157	0.38
	Cranes	2	12	200	0.29

Offsite emissions would be generated by mobile sources related to worker, vendor, and hauling trips occurring during construction. CalEEMod default values for fleet mix, trip length, and trip generation rates were used to calculate emissions from worker and vendor trips. Additional worker trips were added to represent light duty vehicles that would be available for general use and minor hauling. Hauling trips during these phases are assumed to involve a total of 850 delivery trips for concrete from local sources and 240 long distance delivery trips for turbine parts. This amounts to approximately 10 local truck deliveries (round trips) (20 one-way trips) per day and 3 long distance truck deliveries (round trips) (6 one-way trips) per day during a peak day of activity. Hauling trip rates were added

based on the forecasted Initial Repower construction schedule, with assumed trip lengths of 10 miles for local deliveries and 40 miles for long distance deliveries. The trip generation rates for each phase of construction are shown in Table 3.3-9.

Table 3.3-9. Tower Construction Offsite Trip Rate Assumptions

	Trips per day		
Activity	Worker	Vendor	Hauling
Tower Construction 1	66	26	0
Tower Construction 2	156	26	0
Tower Construction 3	66	26	26

Equipment Tiers and Emission Factors

Equipment tiers refer to a generation of emission standards established by the EPA and ARB that apply to diesel engines in off-road equipment. The tier of an engine depends on the model year and horsepower rating; generally, the newer a piece of equipment is, the greater the tier it is likely to have. Excluding engines greater than 750 horsepower, Tier 1 engines were manufactured generally between 1996 and 2003. Tier 2 engines were manufactured between 2001 and 2007. Tier 3 engines were manufactured between 2006 and 2011 and will continue to be produced until Tier 4 engines are completely phased in. Tier 4 engines are the newest and some incorporate hybrid electric technology; they began phase in of small engines (less than 75 horsepower) in 2008. Larger equipment is phased in between 2012 and 2014 with an increasing percentage of equipment required to meet the new standards (South Coast Air Quality Management District 2011). Tier 4 equipment is not currently widely available in all equipment types and sizes due to its recent introduction to the contractor construction fleets and long life of construction equipment.

CalEEMod contains an inventory of construction equipment that incorporates estimates of the number of equipment, their age, their horsepower, and equipment tier from which rates of emissions are developed. The CalEEMod default tier mix was used in this analysis for the estimation of emissions from onsite construction equipment for the unmitigated scenario.

CalEEMod's off-road emission factors are based on the equipment populations from the OFFROAD2007 model. For the unmitigated scenario, emission factors for each phase's applicable construction year were used.

Screening Level Health Risk Assessment

Exposure to construction-related diesel particulate matter (DPM) was assessed by predicting the health risks in terms of excess cancer, non-cancer hazard impacts (HI), and elevated PM2.5 concentrations. A project-level and cumulative screening-level health risk assessment (HRA) was performed according to the following steps.

1. Quantify maximum daily DPM exhaust emissions from site preparation and tower construction at the three construction parcels (see above).
2. Use EPA's AERSCREEN model, which is the screening-level model for AERMOD, to predict PM10 and PM2.5 hourly concentrations at sensitive land uses based on the maximum daily exhaust emissions for each construction parcel quantified under step 1.

3. Calculate the project-level cancer risk, non-cancer HI, and annual PM2.5 concentrations for each parcel based on the AERSCREEN hourly concentrations and the construction durations using BAAQMD-approved methodology.
4. Identify background sources within 1,000 feet of the project site that contribute to existing cancer and non-concern risk. Based on Google Earth files provided by the BAAQMD, there are no stationary sources within 1,000 feet of any parcel. Interstate 580 is approximately 840 feet south of parcel one, 3,300 feet south of parcel two, and 830 feet north of parcel three.
5. Calculate cumulative health risks by adding the background health risks sources identified in step 4 to the project-level health risk and hazard impacts estimated in step 3.

Full Repower Construction Assumptions

The analysis examined the impacts of decommissioning all existing turbines remaining after the Initial Repower and replacing them with up to 300 shrouded turbines providing up to 30 MW of generating capacity. The Full Repower objective is to replace the remaining turbines.

The Full Repower analysis utilizes the same assumptions as the Initial Repower. The same approach used for the Initial Repower for construction staging and management is anticipated for the remaining turbines. The modeling results from the Initial Repower were applied to the Full Repower, but scaled up to reflect the additional turbines that will be decommissioned and replaced. The Initial Repower assumes a 6-month schedule for 4 MW of turbines. The Full Repower analysis assumes that 30 MW of turbines would be installed during a 9-month period. This pace would require more installation sites to have concurrent construction activities. The Full Repower would increase the pace of activity by a factor of five, which would also increase daily emissions by a factor of five. The total emissions generated by the Full Repower would increase by a factor of 7.5 (30 MW/4 MW) compared with the Initial Repower.

Operation

Operational emissions are those emissions that occur during operation of the Initial Repower. The Initial Repower involves the repowering of 4 MW of existing wind generation turbines with new shrouded turbines equivalent to 4 MW of generating capacity. Operation of the new turbines is not expected to result in an increase of direct or indirect emissions compared to the existing conditions, as the project would result in no change in nameplate capacity, electricity generation and O&M activities. Therefore, the Initial Repower is not expected to result in any net change in operational emissions and no new impact to air quality will occur under the Initial Repower and the Full Repower scenarios and is not discussed further in the impact analysis below. Consequently, the analysis below focuses on the construction-related impacts of the Initial and Full Repower phases.

Determination of Significance

Based on Appendix G of the State CEQA Guidelines, the Initial and Full Repower phases would be considered to have a significant effect if they 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 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

As discussed above, BAAQMD is responsible for ensuring that state and federal ambient air quality standards are not violated within the Air Basin. Analysis requirements for construction- and operational-related pollutant emissions are contained in BAAQMD's CEQA Guidelines (2011b). The BAAQMD CEQA Guidelines also contain thresholds of significance for ozone, CO, PM2.5, PM10, TACs, and odors; these thresholds are presented in Table 3.3-10. In the case of construction-related fugitive dust not directly emitted by construction equipment exhaust all projects are considered to have significant impacts unless Best Management Practices (BMPs) are implemented.

Table 3-3.10. BAAQMD Project-Level Mass Thresholds

Pollutant	Construction-Related	Operational-Related
Reactive organic gases (ROG)	54 lbs per day	54 lbs per day, and 10 tons per year
Nitrogen oxides (NO_x)	54 lbs per day	54 lbs per day, and 10 tons per year
PM10 (Exhaust)	80 lbs per day	82 lbs per day, and 15 tons per year
PM2.5 (Exhaust)	54 lbs per day	54 lbs per day, and 10 tons per year
PM10/PM2.5 (Fugitive Dust)	Best Management Practices	–

Source: Bay Area Air Quality Management District 2011b.
lbs = pounds.

To address potential risk and hazard impacts, BAAQMD has developed individual project and cumulative thresholds of significance for air toxics evaluations (Bay Area Air Quality Management District 2011b). The individual project thresholds are as follows.

- An increased cancer risk level of more than 10 in one million.
- An increased non-cancer (chronic or acute) hazard index greater than 1.0.
- An incremental increase of greater than 0.3 $\mu g/m^3$ annual average PM2.5.

The cumulative thresholds are as follows.

- A cancer risk level of more than 100 in one million from all local sources.
- A chronic non-cancer hazard index greater than 10.0 from all local sources.
- An annual average PM2.5 concentration greater than 0.8 $\mu g/m^3$ from all local sources.

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 the significance determinations from Appendix G of the State CEQA Guidelines. As such, the following criteria are used to evaluate the each of the relevant State CEQA Guidelines Appendix G air quality conditions listed above (repeated below in ***bold italic***).

- ***Conflict with or obstruct implementation of the applicable air quality plan.***
    - Would the project result in population or employment growth beyond those contained in the Bay Area 2010 CAP?
- ***Violate any air quality standard or contribute substantially to an existing or projected air quality violation.***
    - **Fugitive dust:** Would the project implement appropriate fugitive dust BMPs recommended by the BAAQMD?
    - **Carbon Monoxide Hotspots:** Would the project fail to meet the BAAQMD's CO screening criteria:
        - Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
        - The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
        - The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway)
- ***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).***
    - **Criteria Pollutants:** Would project criteria pollutant emissions exceed the BAAQMD's thresholds indicated in Table 3-3-10?
    - **Health Risks:** Would the project result in any of the following:
        - A cancer risk level of more than 100 in one million from all local sources.
        - A chronic non?cancer hazard index greater than 10.0 from all local sources.
        - An annual average PM2.5 concentration greater than 0.8 $\mu g/m^3$ from all local sources.
- ***Expose sensitive receptors to substantial pollutant concentrations.***
    - **Health Risks:** Would the project result in any of the following:
        - An increased cancer risk level of more than 10 in one million.
        - An increased non-cancer (chronic or acute) hazard index greater than 1.0.
        - An incremental increase of greater than 0.3 $\mu g/m^3$ annual average PM2.5.
    - **Naturally Occurring Asbestos:** Would the project be located in an area likely to contain naturally occurring asbestos?

Impacts and Mitigation Measures

Initial Repower

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

The following criterion is used to evaluate this impact:

- Would the project result in population or employment growth beyond those contained in the Bay Area 2010 CAP?

In order to determine the Initial Repower's consistency with the applicable air quality plan, the Bay Area 2010 Clean Air Plan (Bay Area 2010 CAP), it is necessary to demonstrate that Initial Repower construction would not exceed the Bay Area 2010 CAP's population or employment growth assumptions, and that it would therefore not lead to increased vehicle miles traveled beyond those estimated in the plan. Implementation of Initial Repower construction would result in no new permanent employees relative to existing conditions, nor would it affect population projections. Therefore, Initial Repower construction would not induce population or employment growth and would result in no net increase in vehicle miles traveled in the Air Basin. Potential impacts associated with Initial Repower construction on population and housing are discussed in Chapter 5, *Other CEQA Considerations*, Section 5.3, *Growth-Inducing Impacts*; potential transportation-related impacts are discussed in Section 3.11, *Traffic*.

In addition, although short-term mitigated emissions resulting from Initial Repower construction would exceed the BAAQMD significance thresholds for NO_X (see Impact AQ-3), the Initial Repower 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 Repowering Program would be consistent with the Bay Area 2010 CAP regardless of this short-term impact. This impact would be less than significant. No mitigation is required.

Impact AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation (less than significant with mitigation)

The following criteria are used to evaluate this impact:

- **Fugitive dust:** Would the project implement appropriate fugitive dust BMPs recommended by the BAAQMD?
- **Carbon Monoxide Hotspots:** Would the project fail to meet the BAAQMD's CO screening criteria:
    - Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
    - The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
    - The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway)

To assist in the analysis of impacts, BAAQMD has identified screening criteria to provide lead agencies and project applicants with a conservative indication of whether a project could result in potentially significant impacts. The screening criteria serve as the first step in a project's significance determination. If all of the screening criteria were met by the project, then the lead agency would not need to perform a detailed impact assessment. In this case, both the Initial Repower and Full Repower phases would exceed the screening threshold (11 acres of construction for an industrial park), and a more detailed assessment would be necessary and/or mitigation measures proposed to reduce impacts to less-than-significant levels. A more detailed assessment of impacts is presented in Impact AQ-3, while non-quantitative Initial Repower impacts are discussed below.

Construction-Related Local Fugitive Dust Emissions

As stated in the BAAQMD CEQA Guidelines, PM10 and PM2.5 emissions from the generation of fugitive construction dust are evaluated separately from PM10 and PM2.5 resulting from the generation of construction equipment exhaust emissions. As indicated in Table 3.3-10, the BAAQMD CEQA Guidelines establish quantitative thresholds for the emission of PM10, PM2.5, ROG and NO_x, but for construction dust, BAAQMD simply considers any project to have significant impacts unless specified BMPS are implemented, and in effect, all construction projects exceed the threshold of significance. The BAAQMD CEQA Guidelines identify eight basic construction mitigation measures for all proposed projects that may reduce impacts to less than significant levels, identified as Mitigation Measure AQ-2. After the application of these basic measures, the construction dust emission impacts would be deemed to be less than significant. Therefore, this impact would be less than significant with mitigation. However, as discussed below, the emission of NO_x during construction would be a potentially significant impact.

Operational Carbon Monoxide Hotspot

Localized high levels of CO (CO hotspot) are associated with traffic congestion and idling or slow moving vehicles. BAAQMD recommends a screening analysis to determine if a project has the potential to contribute to a CO hotspot. The screening criteria identify when site- specific CO dispersion modeling is not necessary. A project would result in a less-than-significant impact on air quality for local CO if the following screening criteria were met.

- Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The Initial Repower is not expected to result in a net change in traffic volume or cause significant impacts on intersection level-of-service during project operation. Therefore, CO hotspot modeling is not necessary, and impacts would be less than significant.

Mitigation Measure AQ-2: Implement basic BAAQMD construction mitigation measures

The following basic construction mitigation measures, as put forth in BAAQMD's CEQA Guidelines, shall be included in the project design and implemented during construction.

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall 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 CCR). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
8. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Impact AQ-3: 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) (significant and unavoidable)

The following criteria are used to evaluate this impact:

- **Criteria Pollutants:** Would project criteria pollutant emissions exceed the BAAQMD's thresholds indicated in Table 3-3-10?
- **Health Risks:** Would the project result in any of the following:
  - A cancer risk level of more than 100 in one million from all local sources.
  - A chronic non-cancer hazard index greater than 10.0 from all local sources.
  - An annual average PM2.5 concentration greater than 0.8 $\mu g/m^3$ from all local sources.

The nonattainment pollutants of concern for this impact are ozone, PM10 and PM2.5. Ozone is not emitted directly into the air, but is a regional pollutant 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. Therefore, BAAQMD does not have a recommended ozone threshold, but has regional thresholds of significance for project-emitted NO_x and ROG.

With regards to cumulative impacts, the BAAQMD's 2011 Guidance states the following.

> In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary. The analysis to assess project-level air quality impacts should be as comprehensive and rigorous as possible.

Therefore, if criteria pollutant emissions from the Initial Repower and Full Repower are projected to be below the BAAQMD thresholds or the screening criteria, then the cumulative impact would be less than significant.

Construction-Related Regional Exhaust Emissions

Construction-related emissions associated with the Initial Repower were calculated using the methods and assumptions described in *Methods for Analysis*. The results of this analysis are presented in Table 3.3-11. The forecasted Initial Repower construction schedule assumes overlap of phases in various months; with all phase activity overlapping in months 2 and 3 (see *Methods for Analysis*). The maximum daily emissions rate therefore reflects this worst-case scenario, and the maximum daily emissions from all phases summed. As shown in the table, the BAAQMD threshold for NO_x is exceeded. Therefore, ROG, PM10, and PM2.5 impacts would be less than significant. NO_x impacts would be significant and unavoidable.

Table 3-3.11. Unmitigated Construction Air Pollutant Emissions

		Maximum Daily Emissions (pounds per day)			
Source		ROG	NO_x	PM10	PM2.5
Site Preparation	Site Preparation 1	12.17	95.81	33.88	19.62
	Site Preparation 2	7.48	57.35	2.15	2.04
	Site Preparation 3	4.99	38.23	1.43	1.36
Tower Construction	Tower Construction 1	2.67	17.74	2.11	0.94
	Tower Construction 2	7.42	49.80	5.20	2.73
	Tower Construction 3	7.57	49.20	3.99	2.31
Maximum Daily Emissions		42.30	308.13	48.76	29.00
BAAQMD Significance Threshold[a]		54	54	82	54
Significant Impact?		No	Yes	No	No

Note: The maximum daily emissions refer to the maximum emissions that would occur in one day. Proposed construction phasing allows overlap of all phases during months 2 and 3 of construction. Therefore, maximum daily emissions reflect the scenario that all phases overlap.
ROG = reactive organic gases.
NO_x = nitrogen oxides.
CO = carbon monoxide.
SO_x = sulfur oxides.
PM10 and PM2.5 = particulate matter.
[a] Bay Area Air Quality Management District 2011b.

Implementation of Mitigation Measure AQ-2 requires project construction to adhere to all BAAQMD basic construction mitigation measures, which would ensure construction-related fugitive dust emissions are mitigated to a less-than-significant level. The basic construction mitigation measures, as listed in the BAAQMD CEQA Guidelines, and associated measures in CalEEMod, are displayed in Table 3.3-12., Mitigation Measure AQ-3a requires all off-road equipment used during all site preparation and tower construction phases to be rated Tier 3 or higher. In addition, because the project would exceed the BAAQMD's NO_X thresholds, the BAAQMD requires the implementation of additional mitigation measures, which are indicated in Mitigation Measure AQ-3b.

Table 3.3-12. BAAQMD Basic Construction Mitigation Measures

Best Available Control Measure[a]		Associated Measure in CalEEMod[b]
a.	All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.	Water exposed areas two times per day.
b.	All haul trucks transporting soil, sand, or other loose material off-site shall be covered.	N/A
c.	All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.	Clean paved roads.
d.	All vehicle speeds on unpaved roads shall be limited to 15 mph.	Vehicle speed on unpaved roads 15 mph.
e.	All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.	N/A
f.	Idling times shall 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 Regulation [CCR]). Clear signage shall be provided for construction workers at all access points.	Along with Measure 7, accounts for a 5 percent reduction in NO_x, PM10, and PM2.5 emissions (applied outside of CalEEMod).
g.	All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.	See Measure 6.
h.	Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.	N/A

Sources:

[a] Bay Area Air Quality Management District 2011b.

[b] Appendix C, see Appendix A of the Air Quality and GHG study.

Table 3.3-13 shows construction emissions after the incorporation of these mitigation measures. After mitigation, the maximum daily emission rate of NO_x would exceed the BAAQMD significance threshold. Therefore, the Initial Repower's NO_x impacts are significant and unavoidable.

Table 3.3-13. Mitigated Initial Repower Construction Air Pollutant Emissions

Source		Maximum Daily Emissions (pounds per day)			
		ROG	NO_x	PM10	PM2.5
Site Preparation	Site Preparation 1	7.62	49.43	16.72	10.04
	Site Preparation 2	6.95	44.83	2.70	2.59
	Site Preparation 3	4.63	29.89	1.80	1.73
Tower Construction	Tower Construction 1	2.12	12.65	2.07	0.90
	Tower Construction 2	5.82	32.39	4.94	2.47
	Tower Construction 3	7.19	40.36	4.10	2.42
Maximum Daily Emissions		**34.33**	**209.55**	**32.33**	**20.15**
Basic Construction Mitigation Measure Reductions (Idling and Maintenance)[a]		–	*-10.48*	*-0.66*	*-0.66*
Maximum Daily Emissions[a]		**34.33**	**199.07**	**31.68**	**19.50**
Significance Threshold[b]		54	54	82	54
Significant Impact?		No	Yes	No	No

Notes: The maximum daily emissions refer to the maximum emissions that would occur in one day. Proposed construction phasing allows overlap of all phases during months 2 and 3 of construction. Therefore, maximum daily emissions reflect the scenario that all phases overlap.

Basic Construction Mitigation Measure Reductions: 5% reduction in exhaust-related NO_x, PM10, and PM2.5 from idling and maintenance measures. Reduction applies to all site preparation and tower construction phases, but is only shown here for the maximum daily emissions.

ROG = reactive organic gases.
NO_X = nitrogen oxides.
CO = carbon monoxide.
SO_x = sulfur oxides.
PM10 and PM2.5 = particulate matter.

[a] PM10 and PM2.5 emissions have been slightly revised from what are presented in Appendix C to only apply reductions from the basic construction mitigation measures to exhaust emissions. This approach is consistent with the BAAQMD's CEQA guidelines.

[b] Bay Area Air Quality Management District 2011b.

Operational Regional Emissions

As discussed in *Methods for Analysis*, the Initial Repower would not result in a net change in operational emissions. Therefore, impacts from operational emissions would be less than significant.

Mitigation Measure AQ-2: Implement basic BAAQMD construction mitigation measures

Please refer to discussion of Mitigation Measure AQ-2 under Impact AQ-2.

Mitigation Measure AQ-3a: Ensure off-road equipment emission standards certification

The developer shall ensure that all off-road equipment used by construction contractors during demolition and grading phases is certified to Tier 3 or higher emission standards. The developer shall provide a record of the equipment used during these phases indicating make, model, year, horsepower, and certification level to the County as verification of compliance.

Mitigation Measure AQ-3b: Implement BAAQMD's additional construction mitigation measures

The following additional construction mitigation measures, as put forth in BAAQMD's CEQA Guidelines, shall be included in the project design and implemented during construction.

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
6. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
7. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
8. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
9. Minimizing the idling time of diesel powered construction equipment to two minutes.
10. The project shall develop a plan demonstrating that the off-road 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 percent NOX reduction and 45 percent 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.
11. Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
12. Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NO_X and PM.
13. Requiring all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations (less than significant)

The following criteria are used to evaluate this impact:

- **Health Risks:** Would the project result in any of the following:
  - An increased cancer risk level of more than 10 in one million.
  - An increased non-cancer (chronic or acute) hazard index greater than 1.0.
  - An incremental increase of greater than 0.3 $\mu g/m^3$ annual average PM2.5.
- **Naturally Occurring Asbestos:** Would the project be located in an area likely to contain naturally occurring asbestos?

This discussion addresses whether the Initial Repower would expose sensitive receptors to substantial pollutant concentrations of CO, DPM, or NOA. A health risk is the probability that exposure to a given pollutant under a given set of conditions will result in an adverse health effect. The health risk is affected by several factors, such as the amount, toxicity, and concentration of the contaminant; meteorological conditions; distance from the emission sources to people; the distance between the emission sources; the age, health, and lifestyle of the people living or working at a location; and the length of exposure to the pollutant.

Two scenarios have the potential to expose sensitive receptors to substantial pollutant concentrations. The first is when a project includes a new or modified source of pollutants and would be located near an existing or proposed sensitive receptor. The second scenario involves a residential or other sensitive receptor development locating near an existing or planned source of pollutants.

The Initial Repower is not considered a sensitive receptor, as it does not fit the criteria discussed above. Rural, low-density communities are located adjacent to the project area, and there are residences that may be considered sensitive receptors. The nearest residence lies approximately 275 meters north of the Castello Parcel.

Toxic Air Contaminants

A screening-level HRA was performed using the AERSCREEN dispersion model and estimated PM10 and PM2.5 exhaust emissions (see Table 3.3-13). Since the construction parcels are separated by over a mile, and there are no receptors within a 1,000 feet of two or more parcels, potential health risks associated with construction at each parcel were evaluated separately. Consistent with the criteria pollutant analysis, it was assumed that site preparation and tower construction would occur concurrently. Accordingly, PM10 and PM2.5 exhaust emissions from site preparation and tower construction at each parcel were added to evaluate maximum daily emissions.

The results of the HRA are summarized in Table 3.3-14 and are compared to BAAQMD's project-level DPM thresholds. Note that Table 3.3-14 assumes implementation of Mitigation Measures 2 and 3a. Violations of the BAAQMD thresholds are shown in underline.

Table 3.3-14. Project-Level Health Risks during Construction (Initial Repower)

Construction Parcel	DPM Non-Cancer Hazard Index (HI)	DPM Cancer Risk (per million)	Average Annual PM2.5 Concentration (ug/m^3)	Receptor (distance in meters from nearest activity)
Site 1	0.06	0.44	0.30	300
Site 2	0.11	1.43	0.56	275
Site 3	0.11	1.42	0.53	400
BAAQMD Threshold	1.00	10	0.30	-

As shown in Table 3.3-14, Initial Repower construction would exceed BAAQMD's significance threshold for average annual PM2.5 concentrations, even after implementation of Mitigation Measures 2 and 3a. Accordingly, the project-level impact of the Initial Repower is considered significant and unavoidable.

Consistent with BAAQMD's (2011) *CEQA Guidelines*, cumulative exposure was evaluated by adding background health risks to the estimated health risks for the project. I-580 was identified as the only background source in within 1,000 feet of the project parcels. The results of the cumulative impact assessment are summarized in Table 3.3-15.

Table 3.3-15. Cumulative Health Risks during Construction (Initial Repower)

Construction Parcel	DPM Non-Cancer Hazard Index (HI)	DPM Cancer Risk (per Million)	Average Annual PM2.5 Concentration (ug/m^3)	Receptor (distance in meters from nearest activity)
Site 1				
Project	0.06	0.44	0.30	300
I-580	0.04	45	0.04	835
Cumulative Total	*0.10*	*45.16*	*0.33*	-
Site 2				
Project	0.11	1.43	0.56	275
I-580	0.00	0	0.0	3,300
Cumulative Total	*0.11*	*1.43*	*0.56*	-
Site 3				
Project	0.11	1.42	0.53	400
I-580	0.02	21	0.02	830
Cumulative Total	*0.12*	*22.08*	*0.54*	-
BAAQMD Threshold	10	100	0.8	-

As shown in Table 3.3-15, construction of the project would not result in cumulatively considerable increases of the non-cancer HI, cancer risk, or annual PM 2.5 concentrations. Therefore, this impact is less than significant.

Naturally Occurring Asbestos

Construction in areas of rock formations that contain naturally occurring asbestos could release asbestos in to the air and pose a health hazard. As described in the Regulatory Setting, BAAQMD enforces ARB's air toxic control measures (ATCMs) at sites that contain ultramafic rock. The ATCM for Construction,

Grading, Quarrying and Surface Mining Operations was signed into state law on July 22, 2002, and became effective in the Air Basin in November 2002. The purpose of this regulation is to reduce public exposure to naturally occurring asbestos. A review of the map indicating areas likely to have rock formations containing naturally occurring asbestos indicates that there is no asbestos in the immediate project area (U.S. Geological Survey 2011). Therefore, it can be reasonably concluded that the Initial Repower would not expose sensitive receptors to naturally occurring asbestos. Impacts would be less than significant. No mitigation is required.

Impact AQ-5: Create objectionable odors affecting a substantial number of people (less than significant)

The Initial Repower would not add new sensitive receptors, and wind turbines are not a typical source of objectionable odors during operation. BAAQMD does not have a recommended odor threshold for construction activities. Diesel exhaust and VOCs would be emitted during construction of the Initial Repower; these emissions are objectionable to some; however, such odorous emissions would disperse rapidly from the project area and therefore should not reach an objectionable level at nearby residences. Impacts would be less than significant. No mitigation is required.

Full Repower

Impact AQ-1[F]: Conflict with or obstruct implementation of the applicable air quality plan (less than significant)

Similar to the Initial Power, Full Repower would not induce population or employment growth and would result in no net increase in vehicle miles traveled in the SFBAAB. Potential impacts associated with Full Repower construction on population and housing are discussed in Chapter 5, *Other CEQA Considerations*, Section 5.3, *Growth-Inducing Impacts*; potential transportation-related impacts are discussed in Section 3.11, *Traffic*.

In addition, although short-term mitigated emissions resulting from Full Repower construction would exceed the BAAQMD significance thresholds for NO_X (see Impact AQ-3), the Full Repower 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 Repowering Program would be consistent with the Bay Area 2010 CAP regardless of this short-term impact and would be less than significant.

Impact AQ-2[F]: Violate any air quality standard or contribute substantially to an existing or projected air quality violation (less than significant with mitigation)

Construction-Related Local Fugitive Dust Emissions

Similar to Initial Repower construction, for the Full Repower, a detailed assessment of impacts is presented in Impact AQ-3, while non-quantitative Initial Repower impacts are discussed below. Implementation of Mitigation Measure AQ-2 would reduce local construction dust emission impacts to less than significant. Therefore, this impact would be less than significant with mitigation.

Operational Carbon Monoxide Hotspot

Similar to the Initial Repower, Full Repower is not expected to result in a net change in traffic volume or cause significant impacts on intersection level-of-service during project operation. Therefore, Full Repower construction would result in a less-than-significant impact on air quality for local CO concentrations based on BAAQMD's screening criteria.

Mitigation Measure AQ-2: Implement basic BAAQMD construction mitigation measures

Please refer to discussion of Mitigation Measure AQ-2 under *Initial Repower*, Impact AQ-2.

Impact AQ-3[F]: 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) (significant and unavoidable)

The Full Repower would replace the remaining turbines with up to 300 shrouded turbines providing up to 30 MW of generating capacity. Construction emissions, although temporary, would exceed BAAQMD thresholds for ROG, NO_x, PM10, and PM2.5. Therefore, the Full Repower would require implementation of Mitigation Measures AQ-2, AQ-3b and AQ-3b as recommended for the Initial Repower phase to help reduce construction emissions.

The analysis of criteria pollutant emissions for the Full Repower utilized the same modeling assumptions that were used for the Initial Repower (refer to discussion of Impact AQ-3) but scaled up the emissions to reflect increased construction activity required to decommission the larger number of existing turbines and replace them with new shrouded turbines. The results of the Full Repower construction analysis are presented in Table 3.3-16.

Table 3.3-16. Full Repower Construction Air Pollutant Emissions

	Maximum Daily Emissions (pounds per day)			
Source	ROG	NO_x	PM10	PM2.5
Maximum Daily Emissions Full Repower	171.65	995.35	161.65	100.75
Basic Construction Mitigation Measure Reductions (Idling and Maintenance)[a]	–	-49.77	-3.28	-3.28
Maximum Daily Emissions Full Repower w/basic Mitigation Measures[a]	171.65	945.58	158.38	97.45
Significance Threshold[b]	54	54	82	54
Significant Impact?	Yes	Yes	Yes	Yes

Note: Full Repower emissions were increased by a factor of five to complete repower of larger number of turbines within the desired nine month timeframe.

[a] PM10 and PM2.5 emissions have been slightly revised from what are presented in Appendix C to only apply reductions from the basic construction mitigation measures to exhaust emissions. This approach is consistent with the BAAQMD's CEQA guidelines.

[b] Bay Area Air Quality Management District 2011b.

The Full Repower construction activities would result in emissions that exceed BAAQMD daily construction thresholds. The Full Repower would exceed ROG, NO_x, PM10, and PM2.5 thresholds after the application of all feasible mitigation measures. Consequently, this impact for the Full Repower is considered significant and unavoidable.

The BAAQMD does not have annual thresholds for construction emissions; however, for disclosure purposes the total emissions generated during construction activities for the Initial Repower and the Full Repower were estimated. Total Initial Repower and Full Repower emissions are provided in Table 3.3-17.

Table 3.3-17. Total Initial Repower and Full Repower Construction Air Pollutant Emissions

	Annual Emissions (tons)			
Source	ROG	NO_x	PM10	PM2.5
Total Emissions Initial Repower	1.67	10.09	1.34	0.83
Total Emissions Full Repower	12.51	75.67	10.32	6.48
Total Emissions with Initial Repower and Full Repower	14.18	85.76	11.71	7.35

The Full Repower would be constructed in the same area as the Initial Repower with the exception of a 68-acre parcel identified by APN 099B-6325-001-04. This parcel is located between I-580 and Altamont Road in the same general vicinity as the other parcels and is not near any sensitive receptors. Therefore, there would be no impacts on sensitive receptors related to TAC or naturally occurring asbestos in the project area. The Full Repower also would not add new sensitive receptors to the project area and would not result in objectionable odors during operation.

Operation of the Full Repower would not exceed air emission thresholds resulting in a conflict or obstruct implementation of applicable air quality plans, violate any air quality standards, contribute to a violation of any air quality standards, expose sensitive receptors to air pollutants (TAC, naturally occurring asbestos), or creation of objectionable odors. Therefore, operation of the Full Repower would result in less-than-significant impacts on air quality.

Mitigation Measure AQ-2: Implement basic BAAQMD construction mitigation measures

Please refer to discussion of Mitigation Measure AQ-2 under *Initial Repower*, Impact AQ-2.

Mitigation Measure AQ-3a: Ensure off-road equipment emission standards certification

Please refer to discussion of Mitigation Measure AQ-3a under *Initial Repower*, Impact AQ-3.

Mitigation Measure AQ-3b: Implement BAAQMD's additional construction mitigation measures

Please refer to discussion of Mitigation Measure AQ-3b under *Initial Repower*, Impact AQ-3.

Impact AQ-4[F]: Expose sensitive receptors to substantial pollutant concentrations (less than significant)

Toxic Air Contaminants

A screening-level HRA was performed using the AERSCREEN dispersion model and estimated PM10 and PM2.5 exhaust emissions (see Table 3.3-17). Similar to the Initial Repower analysis, potential health risks associated with construction at the project parcels were evaluated separately. PM10 and PM2.5 exhaust emissions from site preparation and tower construction at each construction parcel were added to evaluate maximum daily emissions. The results of the HRA are summarized in Table 3.3-18 and are compared to BAAQMD's project-level DPM thresholds. Note that Table 3.3-18 assumes implementation of Mitigation Measures AQ-2, AQ-3a, and AQ3-b. Violations of the BAAQMD thresholds are shown in underline.

Table 3.3-18. Project-Level Health Risks during Construction (Full Repower)

Construction Parcel	DPM Non-Cancer Hazard Index (HI)	DPM Cancer Risk (per Million)	Average Annual PM2.5 Concentration (ug/m3)	Receptor (distance in meters from nearest activity)
Site 1	0.30	2.21	1.48	300
Site 2	0.57	7.28	2.86	275
Site 3	0.53	7.10	2.63	400
BAAQMD Threshold	1.00	10	0.30	-

As shown in Table 3.3-18, project construction would exceed BAAQMD's significance threshold for average annual PM2.5 concentrations, even after implementation of Mitigation Measures AQ-2, AQ-3a, and AQ-3b. Accordingly, the project-level impact is considered significant and unavoidable.

Consistent with BAAQMD's (2011) *CEQA Guidelines*, cumulative exposure was evaluated by adding background health risks to the estimated health risks for the project. I-580 was identified as the only background source in within 1,000 feet of the project parcels. The results of the cumulative impact assessment are summarized in Table 3.3-19.

Table 3.3-19. Cumulative Health Risks during Construction (Full Repower)

Construction Parcel	DPM Non-Cancer Hazard Index (HI)	DPM Cancer Risk (per Million)	Average Annual PM2.5 Concentration (ug/m3)	Receptor (distance in meters from nearest activity)
Site 1				
Project	0.30	2.21	1.48	300
I-580	0.04	45	0.04	835
Cumulative Total	*0.33*	*46.91*	*1.52*	-
Site 2				
Project	0.57	7.28	2.86	275
I-580	0.00	0	0.0	3,300
Cumulative Total	*0.57*	*7.28*	*2.86*	-
Site 3				
Project	0.53	7.10	2.63	400
I-580	0.02	21	0.02	830
Cumulative Total	*0.54*	*27.77*	*2.65*	-
BAAQMD Threshold	10	100	0.8	-

As shown in Table 3.3-15, construction of the project would not result in cumulatively considerable increases of the non-cancer HI, cancer risk, or annual PM 2.5 concentrations. Therefore, this impact is less than significant.

As shown in Table 3.3-19, construction of the project would result in cumulatively considerable increase of annual PM 2.5 concentrations, even after implementation of Mitigation Measures AQ-2, AQ-3a, and AQ-3b. Accordingly, the cumulative impact is considered significant and unavoidable.

Naturally Occurring Asbestos

Similar to the Initial Repower, a review of the map showing areas likely to have rock formations containing naturally occurring asbestos indicates that there is no asbestos in the immediate project area (U.S. Geological Survey 2011). Therefore, it can be reasonably concluded that the Full Repower would not expose sensitive receptors to naturally occurring asbestos. Impacts would be less than significant. No mitigation is required.

Impact AQ-5[F]: Create objectionable odors affecting a substantial number of people (less than significant)

Similar to the Initial Repower, the Full Repower would not add new sensitive receptors, and wind turbines are not a typical source of objectionable odors during operation. Diesel exhaust and VOCs would be emitted during construction of the Full Repower. These emissions are objectionable to some; however, such odorous emissions would disperse rapidly from the project area and therefore should not reach an objectionable level at nearby residences. Impacts would be less than significant. No mitigation is required.

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