2.3 Air Quality

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
3.	**AIR QUALITY** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the project:**				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

This section evaluates the project's potential to impact regional and local air quality from stationary and mobile sources of air emissions from construction activities and operational sources. This section is based on a review of existing documentation of air quality conditions in the region, air quality regulations from the U.S. Environmental Protection Agency (US EPA), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD).

2.3.1 Setting

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants and consequently affect air quality.

Regional Topography, Meteorology, and Climate

The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the air pollutants. The atmospheric pollution potential, as the term is used in this Initial Study, is independent of the location of emission sources and is instead a function of factors such as topography and meteorology.

The San Francisco Bay Area topography is characterized by complex terrain, consisting of coastal mountain ranges, bays, and inland valleys. This complex terrain, especially the higher elevations, distorts the normal wind flow patterns in the Bay Area. The greatest distortion occurs when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common during the summer.

The only major topography break in California's Coast Range occurs in the Bay Area, splitting into the western and eastern ranges; the San Francisco Bay lies between these two ranges. The gap in the western coast range is known as the Golden Gate and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the Bay Area and the Central Valley.

The climate of the San Francisco Bay Area, including the Sonoma and Petaluma Valleys, is a Mediterranean-type climate characterized by warm, dry summers, and mild, wet winters. The climate is determined largely by a high-pressure system that is often present over the eastern Pacific Ocean off the West Coast. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region. During summer and fall, air emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone and secondary particulates (i.e., sulfates and nitrates).

The Sonoma Valley is separated from the Napa Valley and from the Cotati and Petaluma Valleys by mountains. The Sonoma Valley is long and narrow; approximately five miles wide at its southern end and less than a mile wide at the northern end. The subregion that stretches from Santa Rosa to the San Pablo Bay is often considered as two different valleys: the Cotati Valley in the north and the Petaluma Valley in the south.

In the Sonoma Valley, the strongest up-valley winds occur in the afternoon during the summer and the strongest down-valley winds occur during clear, calm winter nights. Prevailing winds follow the axis of the valley, northwest/southeast, while some upslope flow during the day and down-slope flow during the night occurs near the base of the mountains. Summer average maximum temperatures are usually in the high-80s, and summer minimums are around 50 degrees. Winter maximums are in the high-50s to the mid-60s, with minimums ranging from the mid-30s to low-40s.

Petaluma's prevailing winds are from the northwest. When the ocean breeze is weak, strong winds from the east can predominate, carrying pollutants from the Central Valley and the Carquinez Strait. During these periods, up valley flows can carry the polluted air as far north as Santa Rosa. Petaluma's climate is similar to areas closer to the coast.

The air pollution potential of the Sonoma and Petaluma Valleys could be high if there were significant sources of pollution nearby. Prevailing winds can transport locally and non-locally generated pollutants northward into the narrow valleys, which often traps and concentrates the pollutants under stable conditions. The local upslope and down-slope flows set up by the surrounding mountains can also recirculate pollutants. However, local sources of air pollution are

minor. With the exception of some processing of agricultural goods, such as wine and cheese manufacturing, there is little industry in these valleys. Increases in motor vehicle emissions and wood smoke emissions from stoves and fireplaces may increase pollution as the valleys grow in population and as a tourist destination.

Existing Air Quality

BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria pollutants. Existing levels of air quality in the project area can generally be inferred from ambient air quality measurements conducted by BAAQMD at its monitoring stations. The major pollutants of concern in the San Francisco Bay Area, ozone, particulate matter equal to or less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and carbon monoxide (CO), are monitored at approximately twenty locations. Within Sonoma and Napa Counties, the BAAQMD operates two monitoring stations. For PM2.5, the monitoring station on Fifth Street in Santa Rosa was used, while the monitoring station on Jefferson Avenue in Napa was used for ozone, PM10, and CO.

Background ambient concentrations of pollutants are determined by pollutant emissions in a given area as well as wind patterns and meteorological conditions for that area. As a result, background concentrations can vary among different locations within an area. However, areas located close together and exposed to similar wind conditions can be expected to have similar background pollutant concentrations. **Table 2.3-1** shows a five-year (1999 – 2003) summary of maximum monitoring data collected from these stations, compared with California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Sensitive Receptors

For the purposes of air quality and public health and safety, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust and air pollutant concentrations, or other disruptions associated with project construction and/or operation. Sensitive receptor land uses generally include schools, day care centers, libraries, hospitals, residential care centers, parks, and churches. Some sensitive receptors are considered to be more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirmed are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

TABLE 2.3-1
AIR QUALITY DATA SUMMARY (1999–2003) FOR THE PROJECT AREA

Pollutant	Standard[a]	Monitoring Data by Year				
		1999	2000	2001	2002	2003
Ozone						
Highest 1 Hour Average (ppm)[b]		**0.115**	0.077	**0.099**	**0.116**	**0.105**
Days over State Standard	0.09	**4**	0	**1**	**1**	**2**
Days over National Standard	0.12	0	0	0	0	0
Highest 8 Hour Average (ppm)[b]		**0.09**	**0.063**	**0.078**	**0.082**	**0.083**
Days over National Standard	0.08	**1**	**8**	**7**	**1**	**2**
Carbon Monoxide						
Highest 1 Hour Average (ppm)[b]	20	5.5	4.7	5.7	4.2	4.7
Days over State Standard		0	0	0	0	0
Highest 8 Hour Average (ppm)[b]	9.0	4.24	2.80	3.00	2.36	2.49
Days over State Standard		0	0	0	0	0
Particulate Matter (PM2.5)						
Highest 24 Hour Average (µg/m^3)[b]	65	54.9	40.1	75.9	50.7	38.8
Days over National Standard		0	0	1	0	0
Annual Average (µg/m^3)[b]	12	--	10.3	10.8	10.5	8.8
Particulate Matter (PM10):						
Highest 24 Hour Average (µg/m^3)[b]	50	--	45.2	**96.1**	**69.9**	41.4
Days over State Standard			0	**3**	**4**	0
Annual Average (µg/m^3)[b]	30	18.6	16.3	24.0	25.4	20.6

a Generally, state standards are not to be exceeded and national standards are not to be exceeded more than once per year.
b ppm = parts per million; µg/m^3 = micrograms per cubic meter.

NOTE: Values in **bold** are in excess of applicable standard. NA = Not Available.

SOURCE: CARB (2005a)

2.3.2 Regulatory Context

Air quality within the air basin is addressed through the efforts of various Federal, State, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality within the air basin and the pertinent regulations are further discussed.

Criteria Air Pollutants

Regulation of air pollution is achieved through both national and state ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal

Clean Air Act, the US EPA has identified criteria pollutants and established National Ambient Air Quality Standards (NAAQS or national standards) to protect public health and welfare. NAAQS have been established for ozone, CO, nitrogen dioxide (NO2), sulfur dioxide (SO2), PM10, PM2.5, and lead (Pb). These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

To protect human health and the environment, the US EPA has set "primary" and "secondary" maximum ambient thresholds for all six criteria pollutants. Primary thresholds were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. California has adopted more stringent ambient air quality standards for most of the criteria air pollutants (CAAQS or state standards). **Table 2.3-2** presents both sets of ambient air quality standards (i.e., national and state) and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established state ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, air emissions of these pollutants are not expected under the project and thus, there is no further mention of these pollutants in this Initial Study.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide

Carbon monoxide is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low

TABLE 2.3-2
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	0.12 ppm 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1 Hour Annual	0.25 ppm –	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM10)	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 50 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
Fine Particulate Matter (PM2.5)	24 Hour Annual	– 12 µg/m^3	65 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NOx, SO2, and organics.
Lead	Monthly Quarterly	1.5 µg/m^3 –	– 1.5 µg/m^3	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

ppm = parts per million
µg/m^3 = micrograms per cubic meter

SOURCE: BAAQMD (2004)

air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Particulate Matter

Particulate matter, PM10 and PM2.5, represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

Other Criteria Pollutants

Sulfur dioxide is a combustion product of sulfur or sulfur-containing fuels such as coal, which are restricted in the Bay Area. SO2 is also a precursor to the formation of atmospheric sulfate, particulate matter (PM10 and PM2.5) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The Bay Area is in attainment status with both federal and state SO2 standards and is not further evaluated in this analysis.

Ambient lead concentrations meet both the federal and state standards in the Bay Area and the project area. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. As the project would not introduce any new sources of lead emissions, lead emissions are not required to be quantified by the BAAQMD and are not further evaluated in this analysis.

Regulatory Agencies

US EPA is responsible for implementing the myriad programs established under the federal Clean Air Act, such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs), but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

The CARB is responsible for establishing and reviewing the state standards, compiling the California SIP, securing approval of that plan from US EPA, and identifying toxic air contaminants. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the County or regional level. County or regional air quality management districts are primarily responsible for regulating stationary

sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act.

The regional air quality plans prepared by Air Quality Management Districts and Air Pollution Control Districts throughout the state are compiled by the CARB to form the SIP. The local air districts also have the responsibility and authority to adopt transportation control and emission reduction programs for indirect and area-wide emission sources.

BAAQMD is the regional agency with jurisdiction over the nine-county region located in the San Francisco Bay Area Air Basin. Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs.

The BAAQMD is responsible for bringing and/or maintaining air quality in the Air Basin within Federal and State air quality standards. Specifically, the BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Air Basin and to develop and implement strategies to attain the applicable Federal and State standards.

In December 1999, the BAAQMD adopted its *CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The *BAAQMD CEQA Guidelines* is an advisory document and local jurisdictions are not required to utilize the methodology outlined therein. The document describes the criteria that the BAAQMD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts. This Initial Study was prepared following the recommendations of the *BAAQMD CEQA Guidelines*.

Air Quality Plans and Policies

Regional

As required by the federal Clean Air Act and the California Clean Air Act, air basins or portions thereof have been classified as either “attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the standards have been achieved. Nonattainment areas are also required to prepare air quality plans that include strategies for achieving attainment.

The San Francisco Bay Area Air Basin is in attainment of both the NAAQS and the CAAQS for NO2, SO2, CO, and lead. The Bay Area Air Basin is nonattainment for ozone for both the NAAQS and CAAQS. The Bay Area Air Basin is nonattainment of the CAAQS for PM10 and PM2.5, but is in attainment of the NAAQS for PM10 and PM2.5. **Table 2.3-3** displays the Bay Area Air Basin’s current attainment status.

TABLE 2.3-3
ATTAINMENT STATUS OF THE BAY AREA FOR THE STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

		Attainment Status	
Pollutant	**Averaging Time**	**State Standards**[a]	**National Standards**[b]
Ozone	8 Hour	–	Unclassified/Nonattainment
	1 Hour	Nonattainment	Unclassified/Nonattainment
Carbon Monoxide	8 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Nitrogen Dioxide	Annual	–	Attainment
	1 Hour	Attainment	–
Sulfur Dioxide	Annual	–	Attainment
	24 Hour	Attainment	Attainment
	3 Hour	–	Attainment
	1 Hour	Attainment	–
Respirable Particulate Matter	Annual	Nonattainment[c]	Attainment
	24 Hour	Nonattainment[c]	Attainment
Fine Particulate Matter	Annual	Nonattainment[c]	Attainment
	24 Hour	–	Attainment
Lead	Quarter	–	Attainment
	Month	Attainment	–

[a] California standards for ozone, CO (except Lake Tahoe), SO2 (1-hour and 24-hour), NOx, and PM10 are values that are not to be exceeded.

[b] National standards other than for ozone, particulates, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year.

[c] In June 2002, CARB established an 8-hour standard for ozone and annual and 24-hour standards for very fine PM2.5. Currently, the BAAQMD does not have sufficient monitoring data to determine attainment status.

SOURCE: BAAQMD (2004)

Air quality plans developed to meet federal requirements are referred to as SIPs. The federal Clean Air Act and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). The following plans are to include strategies for attaining the standards:

- Ozone Attainment Plan for the 1-Hour National Ozone Standard (ABAG et al, 1999) developed to meet federal ozone air quality planning requirements; and
- Bay Area 2000 Clean Air Plan (BAAQMD, 2000), the most recent triennial update of the *1991 Clean Air Plan* developed to meet planning requirements related to the state ozone standard.

BAAQMD, the MTC, and ABAG have prepared a Bay Area 2001 Ozone Attainment Plan (ABAG et al, 2001). This Plan is a proposed revision to the Bay Area's plan to achieve the

national ozone standard. The Plan is being prepared in response to US EPA's partial approval and partial disapproval of the Bay Area's 1999 Ozone Attainment Plan and finding of failure to attain the national standard for ozone. The revised plan was adopted by the Boards of the co-lead agencies at a public meeting on October 24, 2001. Subsequently, the Plan was approved by the CARB at a hearing on November 1, 200l. On November 30, 2001, CARB submitted the 2001 Plan to US EPA for approval as a revision to the California SIP. This Plan amends and supplements the 1999 Plan and demonstrates attainment of the national ozone standard by 2006.

The 2000 Bay Area Clean Air Plan, adopted by the BAAQMD in December of 2000, is a regional plan that addresses how the Bay Area, including the project area, will attain federal and state air quality standards. The plan states that major sources of emissions should install emission-control devices and that new sources must apply for air quality permits. In addition to the Clean Air Plan, the 2001 Ozone Attainment Plan identifies control measures the region should implement to improve air quality in the San Francisco Bay Area Air Basin.

Sonoma County

The Sonoma County General Plan Resource Conservation Element includes goals and policies regarding the protection and enhancement of air quality in the project region. The County's goal in maintaining air quality is to "Preserve and maintain good air quality and provide for an air quality standard that will protect human health and preclude crop, plant and property damage in accordance with the requirement of the Federal and State Clean Air Acts."

The General Plan Resource Conservation Element (for Air Resources) contains the following air quality goals, objectives, and policies that would generally be applicable to the project:

- Objective RC-13.1: Maintain the projected county air quality as set forth in the Final Environmental Impact Report [for the General Plan EIR] and minimize air pollution.
- Objective RC-13.2: Encourage reduced motor vehicle use as a means of reducing resultant air pollution.
- Policy RC-13b: Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.
- Policy RC-13c: Refer projects to the local air quality districts for their review. (Sonoma County PRMD, 1989)

2.3.3 Air Quality Impacts and Mitigation Measures

This section presents an analysis of the potential air quality impacts associated with project construction and operation. Emissions from construction equipment exhaust and generation of particulate matter (fugitive dust) are the primary concerns in evaluating short-term air quality impacts. Long-term impacts, however, will be negligible since emission-related activities associated with project operation and maintenance will be limited to periodic maintenance trips.

Construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts (BAAQMD, 1999). Project construction would employ a variety of construction and grading equipment. PM10 is the primary air pollutant emitted during construction activities, but additional pollutants are emitted from motor-driven construction equipment, construction vehicles, and workers' vehicles. The "worst-case" scenario for total emissions during the project construction, which would involve conducting all construction activities and excavations and operating all project-related equipment simultaneously, would generate the following emissions:

- PM10: 0.09 tons per day
- ROG: 0.11 tons per day
- CO: 0.32 tons per day
- NOx: 0.66 tons per day

Projected construction emissions are presented in **Table 2.3-4**, broken down by individual equipment. CARB's OFFROAD model was used to develop emission factors for off road equipment such as dozers and CARB's EMFAC2002 was used to develop emission factors for onroad vehicles such as pickup trucks. The Federal Aviation Administration's Emissions and Dispersion Modeling System was used to develop emission factors for helicopter exhaust emissions (assuming a CH-46 aircraft). Fugitive dust emission factors were developed based on guidance from BAAQMD.

Fugitive dust emissions would vary from day to day depending upon the level and type of activity, silt content of the soil, and the prevailing weather. Larger-diameter dust particles (i.e., greater than 30 microns) generally fall out of the atmosphere within several hundred feet of construction sites, and represent more of a soiling nuisance than a health hazard, but the smaller-diameter particles generally remain airborne until removed from the atmosphere by moisture and are associated with adverse health effects.

Based on approximate emission factors developed by the US EPA for construction emissions, uncontrolled project construction-related PM10 emissions are 0.77 tons per acre per month and 51 pounds per acre per day (BAAQMD, 1999). However, water application would provide a 70 to 90 percent reduction in project construction-related PM10 emissions.

a) Conflict with or obstruct implementation of the applicable air quality plan: *less than significant impact.*

Table 2.3-5 presents an emissions inventory of the Bay Area Air Basin by source category, including the net projected contribution of the project to each source category.

Even when assuming "worst-case" conditions, project-related contributions would be less than one percent of the Bay Area Air Basin totals. *BAAQMD CEQA Guidelines* recognizes that construction equipment emits ozone precursors, but indicates that such emissions are included in the emission inventory that is the basis for regional air quality plans. Therefore, construction emissions are not expected to impede attainment or maintenance of ozone standards in the Bay Area and thus, the project would be consistent

TABLE 2.3-4
CONSTRUCTION EMISSIONS ESTIMATES

Activity and Equipment	Pounds per Day			
	ROG	CO	NOx	PM10
Transmission Line Activity				
Material Delivery and Installation				
Rigging Truck (2)	13.93	49.43	145.82	8.80
Mechanic Truck (1)	6.97	24.72	72.91	4.40
Helicopter[a]	105.62	183.78	15.39	0.00
1-Ton Pick-up Truck (4)	0.06	1.40	0.24	0.01
Boom Truck (2)	19.91	70.62	208.32	12.57
2-Ton Pick-up Truck (2)	0.08	1.81	0.58	0.01
Cable Puller Truck (1)	7.96	28.25	83.33	5.03
Tensioner Truck (1)	7.96	28.25	83.33	5.03
Construction Dust[b]	0.00	0.00	0.00	102.00
Line Activity Totals (pounds/day)	162.50	388.25	609.91	137.84
Line Activity Totals (tons/day)	0.08	0.19	0.31	0.07
Substation Activities				
Structure Foundation Excavation				
3/4-Ton Pick-up Truck (2)	0.06	1.40	0.24	0.01
1-Ton Truck (1)	0.05	0.32	0.60	0.01
Truck Mounted Digger (1)	4.44	16.45	49.01	2.69
Crawler Backhoe (1)	7.11	26.32	78.42	4.30
Concrete Truck (1)	7.96	28.25	83.33	5.03
Structure Delivery and Setup				
3/4-Ton Pick-up Truck (2)	0.06	1.40	0.24	0.01
Boom Truck (1)	9.95	35.31	104.16	6.28
Mobile Crane (1)	12.29	44.44	131.69	7.62
Cleanup and Landscaping				
2-Ton Flat Bed Truck (2)	11.94	42.37	124.99	7.54
3/4-Ton Pick-up Truck (2)	0.06	1.40	0.24	0.01
1-Ton Truck (2)	0.05	0.32	0.60	0.01
D-3 Bulldozer	12.44	46.05	137.23	7.52
Grading and Backfill[c]	0.00	0.00	0.00	76.50
Substation Construction Total (pounds/day)	66.43	244.03	710.72	117.52
Substation Construction Total (tons/day)	0.03	0.12	0.36	0.06
Project Construction Total (tons/day)	0.11	0.32	0.66	0.09

a Based on a CH-46 Sky Knight.

b Based on a maximum of two acres per day of soil disturbance and 51 pounds per acre per day (BAAQMD, 1999).

c Based on a maximum of 1.5 acres per day of soil disturbance and 51 pounds per acre per day (BAAQMD, 1999).

SOURCES: PG&E PEA (2004), and CARB (2000)

TABLE 2.3-5
2004 BAY AREA ANNUAL AVERAGE EMISSIONS BY SOURCE CATEGORY

Source Category	Daily Emissions (tons per day)			
	ROG	CO	NOx	PM10
Stationary Sources	89.4	42.3	68.3	16.0
Area-wide Sources	90.1	174.4	19.3	151.6
Mobile Sources	233.4	2104.6	472.3	21.3
Totals	412.9	2321.3	559.9	188.9
Project Construction Contribution	0.11	0.32	0.66	0.09
Percent Net Project Contribution	0.03%	0.01%	0.12%	0.05%

SOURCE: CARB (2005)

with the Bay Area 2000 Clean Air Plan. Also, as shown in **Table 2.3-6**, operational emissions are well below the BAAQMD significance thresholds of 80 pounds per day (0.04 tons per day) for ROG, NOx, and PM10 and 550 pounds per day (0.275 tons per day) of CO, and thus, would also be consistent with the Bay Area 2000 Clean Air Plan.

TABLE 2.3-6
OPERATIONAL EMISSIONS ESTIMATES

Equipment	Daily Emissions (Tons per Day)			
	ROG	CO	NOx	PM10
Light Duty Truck	0.030	0.659	0.183	0.005
Heavy Duty Truck	0.021	0.105	0.696	0.015
Substation and Power Line Operations Total (pounds/day)	0.051	0.765	0.879	0.020
Substation and Power Line Operations Total (tons/day)	<0.000	<0.000	<0.000	<0.000

SOURCE: CARB (2002)

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation: *less than significant impact with mitigation incorporation*.

Construction and operational activities (i.e. grading, excavation, pole removal and installation, line installation, maintenance, etc.) associated with the project would generate emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. The Proposed Project could potentially violate air quality standards or contribute substantially to an existing or projected air quality violation.

Project Construction

As noted in the *BAAQMD CEQA Guidelines*, the determination of significance with respect to construction-related emissions should be based on a consideration of the emissions control measures to be implemented (BAAQMD, 1999). Project construction control measures include all basic and enhanced control measures as listed in the *BAAQMD CEQA Guidelines*. The guidelines state that, "[i]f all of the control measures indicated (as appropriate, depending on the size of the project area) will be implemented, then air pollutant emissions from construction activities would be considered a less than significant impact" (BAAQMD, 1999). Accordingly, all air quality impacts associated with project construction would be less than significant with mitigation incorporated.

Impact 2.3-1: Construction activities associated with the project would generate emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. This would be a less than significant impact with implementation of Mitigation Measures 2.3-1a, 2.3-1b, and 2.3-1c.

Mitigation Measure 2.3-1a: During construction, PG&E shall ensure that its employees and contractors implement the following measures prescribed by BAAQMD to ensure the reduction of the project's contribution to local PM10 concentrations are to a level that is less than significant.

- For all active construction areas, water as needed or apply soil stabilizers to control dust.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard[1].
- If applicable, sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at or nearby construction sites.
- Sweep streets daily (with water sweepers) if visible soil material are carried onto adjacent public streets.

Mitigation Measure 2.3-1b: The following enhanced control measures shall be implemented at the Leveroni Road staging area or any construction sites greater than four acres pursuant to BAAQMD requirements:

- Hydroseed or apply (non-toxic) soil stabilizers to previously graded inactive (for more than 10 days) construction areas.
- Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.

[1] Freeboard is the distance between the material and the top of the haul truck. This mitigation measure reduces the overtopping and slippage of material, and thus, fugitive dust.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

Mitigation Measure 2.3-1c: To mitigate equipment exhaust emissions, PG&E shall require its employees and/or construction contractors to comply with the following requirements:

- Properly tune and maintain construction equipment in accordance with manufacturers' recommended maintenance schedule, if reasonably available. This applies to vehicles used for construction activities only, and does not apply to commuter vehicles

- Use best management construction practices to avoid unnecessary emissions (i.e., require trucks and vehicles in loading and unloading queues to turn engines off when not in use).

- Use diesel trucks which are post-1991 based on CARB inspection program (dated June 3, 1998) for heavy-duty diesel trucks and buses (CARB, 1998).

- Implement a carpooling strategy for construction workers prior to commencing construction (during construction worker orientation and training).

Significance after Mitigation: Less than significant.

Project Operations

Corona activity on electrical conductors surrounded by air can produce very tiny amounts of gaseous effluents: ozone and NOx. Ozone is a naturally occurring part of the air, with typical rural ambient levels around 10 to 30 parts per billion (ppb) at night and peaks of 100 ppb and higher. In urban areas, concentrations greater than 100 ppb are common. The NAAQS for ozone is 120 ppb, not to be exceeded as a peak one-hour concentration on more than one day a year (the standard for NO2 is 140 ppb). Ozone is the primary photochemical oxidant, representing 90 to 95 percent of the total. In general, the most sensitive ozone measurement instrumentation can measure about one ppb.

Gaseous effluents can be produced by corona activity on high voltage transmission line electrical conductors during rain or fog conditions, and can occur for any configuration or location. Typically, concentrations of ozone at ground level for 230 kV and lower voltage transmission lines during heavy rain are significantly less than the most sensitive instruments can measure, and thousands of times less than ambient levels (and nitrogen oxides are even smaller). Thus, because the Proposed Project would result in the construction and operation of a 115 kV transmission line, the project would not result in a significant impact.

The only other air emissions that would be created by the project, once operational, are those associated with maintenance and repair of project components. Project maintenance and repair would not involve grading, excavation, or the use of any motor-driven

equipment, but would require the use of vehicles to transport maintenance workers to and from the site. As shown in **Table 2.3-6**, using an estimated worst-case scenario of 100 vehicle miles per day (80 miles light-duty trucks and 20 miles heavy-duty trucks) for maintenance and repairs, total operations-related emissions would be considerably less than the BAAQMD thresholds of significance of 80 pounds per day (0.4 tons per day) for ROG, NOx, and PM10 and 550 pounds per day (0.275 tons per day) for CO. Therefore, potential operational impacts to air quality would be less than significant.

Mitigation Measure 2.1-1

As a result of the Land Use and Aesthetics analyses (see Sections 2.1 and 2.9, respectively), Mitigation Measure 2.1-3 would require the new 115 kV single-circuit transmission line to be undergrounded beneath Leveroni Road from approximately Fifth Street West to the Sonoma Substation (see **Figure 2.1-4**), where the circuit would emerge through a substation riser structure and terminate on a substation bus structure.

Although under Mitigation Measure 2.1-1, there would be more ground disturbance with the excavation of the trench, PM10 air quality impacts would not be significant as dust control measures would be implemented during construction in accordance with the *BAAQMD CEQA Guidelines*. Excavated dirt would be hauled from the site as it is removed. As the undergrounding construction schedule would last 3 months (2.5 months longer than the original project), additional air quality impacts from motor-driven construction equipment and vehicles would occur. However, these impacts would be temporary and would not exceed significance criteria for ROG, NOx, and PM10 (see **Table 2.3-7**).

TABLE 2.3-7
MITIGATION MEASURE 2.1-1 EMISSIONS ESTIMATES

	Daily Emissions (Tons per Day)		
Equipment	**ROG**	**NOx**	**PM10**
Fugitive Dust	--	--	14.6
Combustion Sources	8.11	37.4	1.94
Mitigation Measure 2.1-3 Total (pounds/day)	8.11	37.4	16.5
Mitigation Measure 2.1-3 Total (tons/day)	0.004	0.019	0.008

SOURCE: BAAQMD (1999)

Impact 2.3-2: Construction activities associated with Mitigation Measure 2.1-1 would generate additional emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. Implementation of Mitigation Measure 2.1-1 could violate air quality standards or contribute substantially to an existing or projected air quality violation. However, this would be a less than significant impact with implementation of Mitigation Measures 2.3-1a, 2.3-1b, and 2.3-1c.

Mitigation Measure 2.3-2: Implement Mitigation Measures 2.3-1a, 2.3-1b, and 2.3-1c.

Significance after Mitigation: Less than significant.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors): *less than significant impact*.

According to the *BAAQMD CEQA Guidelines*, a project's contribution to cumulative impacts should be considered significant if the project's impact individually would be significant (i.e. exceeds the BAAQMD's quantitative thresholds). For a project that would not result in a significant impact individually, the project's contribution to any cumulative impact would be considered less than significant if the project is consistent with the local General Plan and the local General Plan is consistent with the applicable regional air quality plan. In this case, the applicable regional air quality plan would be the 2000 Bay Area Clean Air Plan. The project is consistent with the goals and objectives related to air quality in the Sonoma County General Plan. The Sonoma County General Plan was completed prior to publication of the 2000 Bay Area Clean Air Plan. However, the County's goal in maintaining air quality is to "[p]reserve and maintain good air quality and provide for an air quality standard that will protect human health and preclude crop, plant and property damage in accordance with the requirement of the Federal and State Clean Air Acts." Thus, the General Plan is consistent with the 2000 Bay Area Clean Air Plan and the intent to improve air quality and achieve compliance with ozone standards in the Bay Area Air Basin. Therefore, this would be a less than significant impact.

d) Expose sensitive receptors to substantial pollutant concentrations: *less than significant impact with mitigation incorporated*.

A small church and school are located approximately 1/4 mile southeast of the Sonoma Substation. Residential neighborhoods exist along Leveroni and Felder Roads, and a few rural homes are scattered along the project corridor. Two staging areas are proposed for the project; one located at the Lakeville Substation, and the other near the east end of the project, adjacent to Sonoma Creek. A few residences are located within one mile of the staging areas. Construction pull sites would be located throughout the project area along the transmission line corridor.

Impact 2.3-3: Construction activities would generate emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. These activities could expose sensitive receptors to substantial pollutant concentrations.

Mitigation Measure 2.3-3: Implement Mitigation Measures 2.3-1a, 2.3-1b, and 2.3-1c.

Significance after Mitigation: Less than Significant.

Per the *BAAQMD CEQA Guidelines*, application of the BAAQMD recommended emission reduction measures described in Mitigation Measure 2.3-1a would reduce the impacts of construction-related emissions to less than significant levels. Because impacts related to construction emissions would be less than significant, impacts to sensitive receptors would also be reduced to less than significant levels.

e) Create objectionable odors affecting a substantial number of people: *less than significant impact*.

Proposed Project

The operation of the transmission line would not create odorous emissions. However, project construction could include sources, such as diesel equipment operation, which could result in the creation of objectionable odors. Since the construction activities would be temporary, move around geographically, and generally take place in rural areas, these activities would not affect a substantial number of people. Moreover, *BAAQMD CEQA Guidelines* provides a list of facilities known to emit objectionable odors; the Proposed Project does not include the types of facilities that are contained in that list.

Mitigation Measure 2.1-1

Project construction associated with the undergrounding of a portion of the transmission line along Leveroni Road from about Fifth Street West to the Sonoma Substation, could include sources, such as diesel equipment operation and asphalt re-paving, which could result in the creation of objectionable odors. The construction activities would be temporary and infrequent and these activities would not affect a substantial number of people.

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