

4.14 AIR QUALITY

4.14.1 INTRODUCTION TO AIR QUALITY RESOURCES

This section begins by identifying the system-wide regulatory context and environmental setting (4.14.1 through 4.14.3) for the project. This is followed by a specific environmental setting description for each of the five regional bundles (Section 4.14.4). The standards of significance and analytical methods for determining impacts are then detailed (Sections 4.14.5 and 4.14.6, respectively). Finally, the potential air quality impacts and mitigation methods are described and evaluated (Section 4.14.7).

4.14.2 SYSTEM-WIDE REGULATORY CONTEXT

This section describes regulations and policies that apply to the entire project, including all regional bundles. Federal and State agencies have established air quality standards and regulations that affect proposed projects. The Federal and State regulatory considerations that may apply to the project are listed in Sections 4.14.2.1 and 4.14.2.2, respectively. A description of how regional regulations and policies pertain to the project is provided in Section 4.14.2.3. See Section 4.14.4 for the individual local air quality regulatory context of each regional bundle.

4.14.2.1 Federal Regulations and Policies

- The Federal Clean Air Act of 1970 directs the attainment and maintenance of National Ambient Air Quality Standards (NAAQS). The 1990 Amendments to this Act determine attainment and maintenance of NAAQS (Title I), motor vehicles and fuel reformulation (Title II), hazardous air pollutants (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone protection (Title VI), and enforcement (Title VII).
- The U.S. Environmental Protection Agency (U.S. EPA) implements New Source Review (NSR) and Prevention of Significant Deterioration (PSD).
- The EPA implements the NAAQS and determines attainment of Federal air quality standards on a short- and long-term basis.

4.14.2.2 State Regulations and Policies

- The California Air Resources Board (CARB) has established the California Ambient Air Quality Standards (CAAQS) and determines attainment status for criteria air pollutants.
- The California Clean Air Act (CCAA) went into effect on January 1, 1989, and was amended in 1992. The CCAA mandates achieving the health-based CAAQS at the earliest practicable date.
- The California Health and Safety Code, Division 26 Air Resources, Part 6 Air Toxics Hot Spots Information and Assessment, Section 44300, requires an inventory of air toxics emissions from individual existing facilities, an assessment of health risk, and notification of potential significant health risk when found to be present.
- California Health and Safety Code, Division 26 Air Resources, Chapter 6 Facility Toxic Air Contaminant Risk Reduction Audit and Plan, Section 44390, provides guidelines to identify a more realistic health risk, requires high risk facilities to submit an air toxic emission reduction plan, holds air

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districts accountable for ensuring that the plans will achieve their objectives, and high risk facilities will be required to achieve their planned emission reduction.

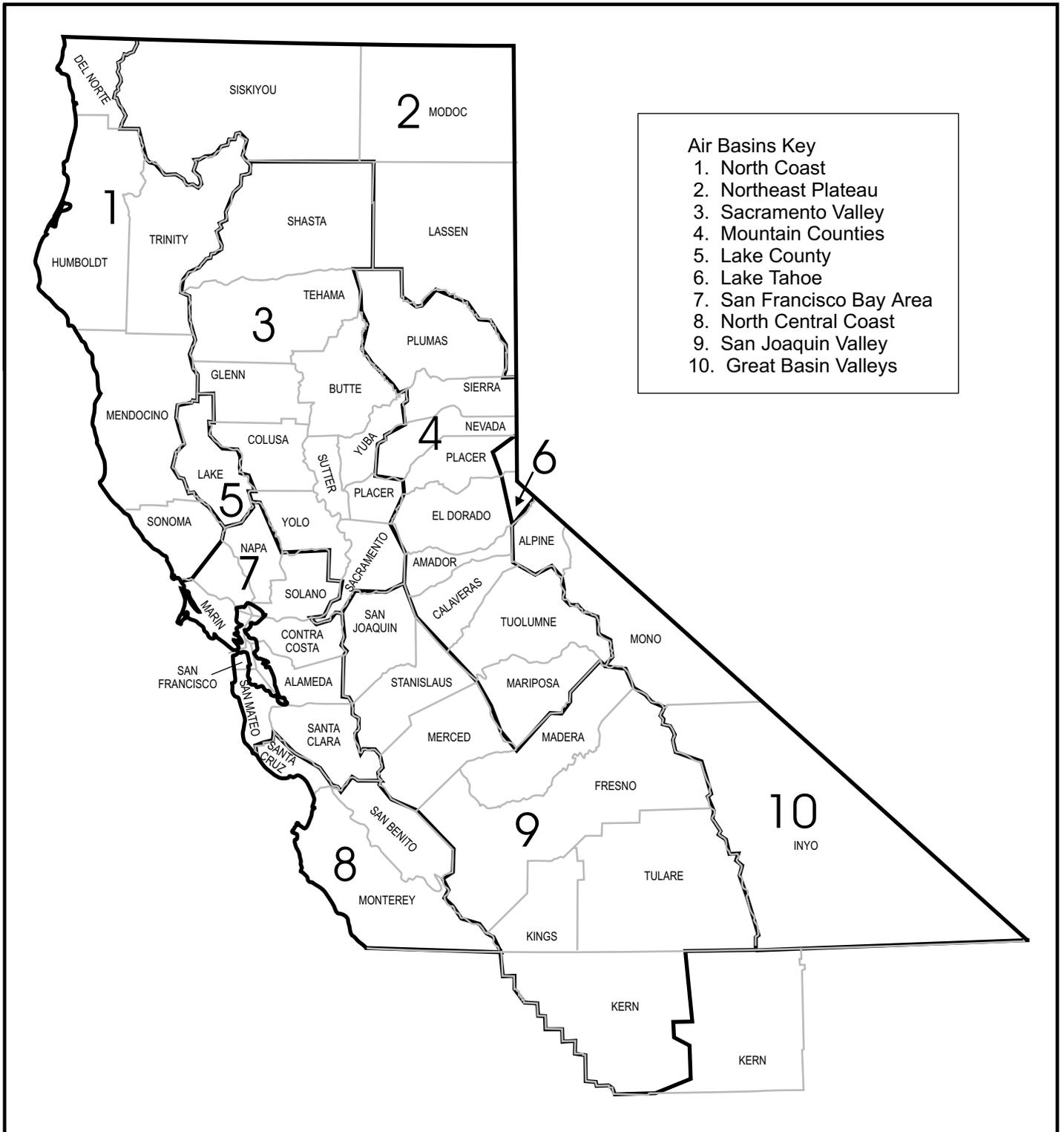
- California Health and Safety Code, Division 26 Air Resources, Chapter 3.5 Toxic Air Contaminants, Article 2.5 Coordination with the Federal Act, Section 39656 sets forth provisions to implement the Federal program for hazardous air pollutants.
- California Health and Safety Code, Division 26 Air Resources, Part 4 Non-vehicular Air Pollution Control, Chapter 4 Enforcement, Section 42301.6, requires new or modified sources of air contaminants located within 1,000 ft. from the outer boundary of a school to give public notice to the parents of school children before an air pollution permit is granted.
- Section 21151.4 of the California Public Resources Code, Division 13 Environmental Quality, Chapter 4 Local Agencies, addresses Hazardous Air Pollutant releases within one-fourth mile of a school site.

4.14.2.3 Regional Regulations and Policies

Pacific Gas and Electric Company's hydroelectric facilities are located high in the Sierra Nevada and Cascade Mountain Ranges in sixteen different river basins. As illustrated in Figure 4.14-1, these facilities are located within seven air basins, which are regulated by 16 different air quality agencies. Table 4.14-1 lists the air basins and the agencies that regulate them.

Table 4.14-1 Air Basins Affected by the Proposed Project

Air Basin	Agency
1. North Coast	- Mendocino County Air Quality Management District
2. Sacramento Valley	- Shasta County Air Quality Management District - Tehama County Air Pollution Control District - Butte County Air Quality Management District - Feather River Air Quality Management District (Yuba County) - Placer County Air Pollution Control District
3. Mountain Counties	- Northern Sierra Air Quality Management District (Plumas and Nevada counties) - Placer County Air Pollution Control District - El Dorado County Air Pollution Control District - Tuolumne County Air Pollution Control District - Amador County Air Pollution Control District - Mariposa County Air Pollution Control District - Calaveras County Air Pollution Control District
4. San Joaquin Valley	- San Joaquin Valley Unified Air Pollution Control District (Fresno, Kern, Madera, Merced & Tulare Counties)
5. Lake County	- Lake County Air Quality Management District
6. Northeast Plateau	- Lassen County Air Pollution Control District
7. Great Basin Valleys	- Great Basin Unified Air Pollution Control District (Alpine County)



- Air Basins Key**
1. North Coast
 2. Northeast Plateau
 3. Sacramento Valley
 4. Mountain Counties
 5. Lake County
 6. Lake Tahoe
 7. San Francisco Bay Area
 8. North Central Coast
 9. San Joaquin Valley
 10. Great Basin Valleys

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Figure 4.14-1
**Northern and
 Central California
 Air Basins**

Aspen
 Environmental Group

Source: Base Map Originally Prepared by CEPA, Air Resources Board, 1997, and modified by Aspen Environmental Group.

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Air quality regulations vary depending on the local county and air quality management district. For Pacific Gas and Electric Company hydroelectric projects, Pacific Gas and Electric Company periodically obtains permits from the local air quality management districts to burn debris from canals, levees, ditches, and reservoirs for maintenance purposes. While specific permitting requirements for internal combustion engines (ICE) vary from one air basin to another, the majority of ICEs at hydroelectric facilities are exempt from permitting due to either the low frequency of operation or the limited operational emissions generated. Permits have either been granted or are in the application review process for the few ICEs at Pacific Gas and Electric Company facilities that require them. The majority of Pacific Gas and Electric Company's portable equipment is exempt from registration with CARB because they do not meet the horsepower thresholds required for registration, although a few are subject to local permitting requirements.

4.14.3 SYSTEM-WIDE AIR QUALITY SETTING

4.14.3.1 Regional Climatologic Conditions of the Study Area

In order to understand complex air quality conditions that affect the project, a general understanding of the climatologic influences is required. The regional climates that affect the project generally fall into one of the following descriptions: Western Slopes of Sierra Nevada Mountain Range; and the Eel and Russian River Coastal Ranges. Characteristics of these regional climates are described below. Refer to Section 4.14.4 for specific climatologic data associated with the individual regional bundles.

Western Slopes of Sierra Nevada

The climate along western slopes of the Sierra Nevada fluctuates with the seasons: summers are warm and generally dry, except for occasional thunderstorms caused by hot air from the Central Valley rising into the Sierra Nevada; winters are cold and wet, with snowfall occurring regularly above the 4,000-foot elevation. Due to the gradual slope of the Sierra Nevada, warm, moist air coming off the Pacific Ocean to the west condenses as it cools while moving up the slope, bringing high levels of precipitation and snow. The highest levels of snowfall and precipitation typically occur in January.

Eel and Russian River Coastal Ranges

The climate of the Eel and Russian River basins is Mediterranean with sub-regional variation. Precipitation varies throughout these basins, but in general, the northern and western areas receive the highest precipitation. Approximately 75 percent of the precipitation occurs in the form of rain between November and March. Snow occurs in some areas of higher elevation.

4.14.3.2 Criteria Pollutants

The quality of the surface air (air quality) is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects. The degree of air quality degradation is then

compared to the current National and California Ambient Air Quality Standards (NAAQS and CAAQS). Those standards currently in effect in California are shown in Table 4.14-2. Because of unique meteorological problems in the State, and because of differences of opinion by medical panels established by the California Air Resources Board (CARB) and the EPA, there is considerable diversity between State and Federal standards currently in effect in California. In general, the CAAQS are more stringent than the corresponding NAAQS.

Air quality standards are designed to protect those people most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. It should be noted that healthy adults can tolerate occasional exposure to air pollutant concentrations above these minimum standards before adverse effects are observed. Table 4.14-3 provides a summary of the health effects from the major criteria air pollutants.

4.14.3.3 Toxic Air Contaminants

Toxic air contaminants (TACs) are among hazardous air pollutants (HAPs). TACs are air pollutants that are known or suspected to cause cancer, genetic mutations, birth defects, or other serious illnesses in people. TACs come from three basic source types: industrial facilities, internal combustion engines (stationary and mobile), and small "area sources" (such as solvent use). Generally, TACs behave in the atmosphere as other pollutants. Some of the TACs are Volatile Organic Compounds (VOCs) and could contribute to tropospheric ozone generation. The concentrations of both inert and toxic pollutants are therefore determined by the level of emissions at the source and the meteorological conditions encountered as these pollutants are transported away from the source. TACs are not regulated by the AAQS, but by Title III of the Clean Air Act Amendments of 1990.

The baseline and project emission source types (mainly on-road and off-road vehicles) do not have a high TAC profile, and the overall emissions of TACs from the project are not expected to exceed regulated thresholds. Additionally, the project locations are not near large population centers and would not significantly impact cumulative risk from TACs.

4.14.3.4 Air Basin Attainment Status

The attainment status of any region is evaluated by monitoring ambient concentrations of air pollutants. Non-attainment is a term used to indicate violations of the standard. A summary of the air quality status for each regional bundle, relative to meeting the National and State AAQS, is provided in Section 4.14.4. With the exception of a small hydrogen sulfide non-attainment area in Placer County that will not be impacted by the project, the entire project area is unclassified or in attainment for sulfur dioxide, sulfates, lead, hydrogen sulfide, vinyl chloride and visibility reducing particles. Therefore, there will be no further discussion of the attainment status of these six criteria pollutants.

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Table 4.14-2 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ^a	National Standards ^b	
			Primary ^{c,d}	Secondary ^{c,e}
Ozone (O ₃)	8-hour ^f	NS	0.08 (160 µg/m ³)	NS
	1-hour	0.09 ppm (180 µg/m ³)	0.12ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m ³)	9.0 ppm (10 mg/m ³)	NS
	1-hour	20.0 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	NS
Nitrogen Dioxide (NO ₂)	Annual Avg.	NS	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)
	1-hour	0.25 ppm (470 µg/m ³)	NS	NS
Sulfur Dioxide (SO ₂)	Annual Avg.	NS	80 µg/m ³ (0.03 ppm)	NS
	24-hour	0.05 ppm (131 µg/m ³)	365 µg/m ³ (0.14 ppm)	NS
	3-hour	NS	NS	1300 µg/m ³ (0.5 ppm)
	1-hour	0.25 ppm (655 µg/m ³)	NS	NS
Suspended Particulate Matter (PM ₁₀)	Ann.Geo.Mean	30 µg/m ³	NS	NS
	Ann.Arith.Mean	NS	50 µg/m ³	50 µg/m ³
	24-hour	50 µg/m ³	150 µg/m ³	150 µg/m ³
Suspended Particulate Matter (PM _{2.5}) ^g	24-hour	NS	65 µg/m ³	NS
	Annual	NS	15 µg/m ³	NS
Sulfates (SO ₄)	24-hour	25 µg/m ³	NS	NS
Lead (Pb)	30-day Avg. Calendar Qtr.	1.5 µg/m ³	NS	NS
		NS	1.5 µg/m ³	1.5 µg/m ³
Hydrogen Sulfide (H ₂ S)	1-hour	0.03 ppm (42 µg/m ³)	NS	NS
Vinyl Chloride	24-hour	0.010 ppm (26 µg/m ³)	NS	NS
Visibility Reducing Particles	1 Observation		NS	NS

Notes: NS = no standard; ppm = parts per million; µg/m³ = microgram per cubic meter; mg/m³ = milligrams per cubic meter

- California standards for O₃, CO, SO₂ (1-hour), NO₂, and PM₁₀ are values that are not to be exceeded. SO₄, Pb, H₂S, Vinyl Chloride, and visibility-reducing particles standards are not to be equaled or exceeded.
- National Standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The O₃ Standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
- Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon reference temperature of 25 degrees Centigrade (°C) and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.
- National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the U.S. EPA.
- National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by U.S. EPA.
- The 8-hour standard was finalized by U.S. EPA in 1997. However, U.S. EPA is being challenged in court and the implementation of the standard is uncertain at this time.
- With regards to PM_{2.5} (particulates less than 2.5 microns in aerodynamic diameter), the enforcement of the PM_{2.5} standard by the U.S. Environmental Protection Agency was found to be unconstitutional based on the May 14, 1999 opinion from the U.S. Court of Appeals from the District of Columbia Circuit. USEPA is appealing this decision and the status of the implementation of this standard is uncertain.
- Prevailing visibility is defined as the greatest visibility, which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors

Table 4.14-3 Summary of Health Effects of the Major Criteria Pollutants

Air Pollutant	Adverse Effects
Ozone	Eye Irritation
	Respiratory function impairment
	Aggravation of respiratory and cardiovascular diseases
Carbon Monoxide	Impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin
	Aggravation of cardiovascular disease
	Impairment of central nervous system function
	Fatigue, headache, confusion, dizziness
	Death at high levels of exposure
	Aggravation of some heart diseases (angina)
Nitrogen Dioxide	Risk of acute and chronic respiratory disease
Suspended Particulates	Increased risk of chronic respiratory disease
	Reduced lung function
	With SO ₂ , may produce acute illness
	Particulate matter 10 microns or less in size (PM10) may lodge in and/or irritate the lungs

Source: South Coast Air Quality Management District (SCAQMD), CEQA Air Quality Handbook, 1993

4.14.4 REGIONAL AND LOCAL SETTING AND REGULATORY CONTEXT

Hydroelectric facilities do not consume substantial amounts of fossil fuels or emit appreciable amounts of air pollutants. Hydroelectric facilities do not substantially affect climate, although they can potentially impact local meteorology in places where cloud seeding is conducted. Air quality effects under current Pacific Gas and Electric Company hydroelectric operations occur from vehicular traffic, use of stationary internal combustion engines and portable generators, burning of debris, and the storage, dispensation, and use of VOC-containing chemicals. Emissions from stationary sources are regulated by various government agencies and often subject to permit requirements.

If the facilities in a watershed region are sold to a single owner, employment is expected to remain substantially the same at the facilities. Air emissions associated with vehicular traffic would, therefore, also be expected to remain fairly constant. If the facilities in a regional bundle are sold to multiple owners, employment may permanently increase among the separate facility owners. Temporary increases may also be more likely if construction is undertaken to duplicate service center, switching center, and communication functions. If employment levels increase, air emissions associated with vehicle use could also be expected to increase temporarily and/or permanently. On a regional basis, the number of employees necessary to operate and maintain

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hydroelectric facilities is fairly small, making it unlikely that foreseeable increases in employment would increase vehicular emissions in any significant way.

New operators may revise how much power is produced during different seasons at these facilities to maximize revenue or maximize protection and marketing of water supply. These changes in power management would affect the emissions potential of fossil-fuel fired generating stations in the Western United States. Power management scenarios and their resultant effect to the Western U.S. power station emissions were modeled and those results are presented in Section 4.14.8.1.

This section consists of descriptions of the air quality setting and local regulations/policies that are relevant to each regional bundle. It should be noted that the future land use activities forecast for the project (i.e. hydroelectric power generation, residential development, timber harvest, and mineral extraction) are not stationary sources and are not subject to local air quality district rules and regulations.

4.14.4.1 Shasta Regional Bundle

Regional Setting

The Shasta Regional Bundle area is found in the Northern Sacramento Valley Planning Area (NSVPA) of the Sacramento Valley Air Basin. The NSVPA is comprised of seven counties, including Shasta and Tehama. Shasta County is within the jurisdiction of the Shasta County Air Quality Management District and Tehama County is in the Tehama County Air Pollution Control District.

The amount of a given pollutant in the ambient atmosphere is determined by the amount of pollutant emitted and the atmosphere's ability to transport and dilute the pollutant. The environmental conditions of the northern Sacramento Valley contribute to adverse air quality. The Sacramento Valley, bordered by mountain ranges to the east and west, acts as a basin that traps pollution. Temperature inversions, which occur when surface air is trapped by an overlying layer of warmer air, exacerbate topographic effects. The transport of pollutants from large urban areas like the San Francisco Bay Area, Stockton, and Sacramento affects the NSVPA. The region's adverse environmental conditions are coupled with increasing emissions due to growth and urbanization.

Climate

The climate of the Shasta Regional Bundle is generally described in the subsection entitled Western Slopes of Sierra Nevada, which is located in Section 4.14.3.1, above. Table 4.14-4 provides specific weather and climate data for the Shasta Regional Bundle.

Table 4.14-4 Climate Data For the Shasta Regional Bundle Projects

Station	Project Area	Elevation (ft)	Air Temperature (F°)		Period of Record for Temperature	Precipitation (inches)	Period of Record for Precipitation
			Average	Extremes			
Hat Creek 1 Powerhouse	Hat Creek & Pit 1	2,975	49.8	-20-110	1948-1998	18.04	1921-1998
Pit 1 Powerhouse	Pit 1	2,849	50.2	-9-114	1972-1998	19.36	1964-1998
Shasta Dam	Pit 3,4, and 5, McCloud-Pit	3,544	49.8	-20-110	1948-1998	74.31	1943-1995
Pit 5 Powerhouse	Pit 3,4, and 5	1,425	57.4	0-113	1972-1998	72.26	1945-1998
Volta 1 Powerhouse	Kilarc Cow & Battle Creek	2,213	59.1	0-113	1948-1998	33.65	1921-1998
Redding Fire Station 2	Battle Creek	Not Available	62.8	17 - 114	1876-1960	Not Available	Not Available
Coleman Fish Hatchery	Battle Creek	Not Available	Not Available	Not Available	Not Available	28.07	1933-1995

Source: Pacific Gas and Electric Company, October 1999. Proponent's Environmental Assessment, Application No. 99-09-053, Volume 3, page 5-68

Hydroelectric facilities emit few air pollutants, such as “greenhouse gases”, that cause global warming. Thus, hydroelectric facilities do not have substantial impacts on climate.

Air Quality Attainment Status

Pacific Gas and Electric Company's hydroelectric facilities and Associated Watershed Lands in the Shasta Regional Bundle are located in Shasta and Tehama counties. Table 4.14-5 provides the air quality attainment status of the counties.

Table 4.14-5 Attainment Status of Counties within the Shasta Regional Bundle

Air Basin/ County	O ₃		CO		NO ₂		PM ₁₀	
	State	Federal	State	Federal	State	Federal	State	Federal
Shasta	NA	U/A	U	U/A	A	A	NA	U/A
Tehama	NA	U/A	U	U/A	A	A	NA	U/A

Source: CARB, 2000; EPA, 2000

Notes: A = Attainment; NA = Non Attainment; U = Unclassified; U/A = Unclassified/Attainment

The ambient air quality in Shasta County is unclassified for carbon monoxide, classified as attainment for nitrogen dioxide, and is classified as non-attainment for ozone and PM₁₀ under the State standards. The county is in attainment or unclassified for ozone, carbon monoxide, nitrogen dioxide, and PM₁₀ under the Federal requirements.

The ambient air quality in Tehama County is unclassified for carbon monoxide, classified as attainment for nitrogen dioxide, and is classified as non-attainment for ozone and PM₁₀ under the State standards. The county is in attainment or unclassified for ozone, carbon monoxide, and PM₁₀ under the Federal requirements.

Sensitive Receptors

The majority of the Shasta Regional Bundle, including hydroelectric facilities and Associated Watershed Lands, is located in rural or remote areas. Some Watershed Lands may be located in areas near industry or where major transportation routes cross and, therefore, may have poorer air quality than at more remote locations. Air quality in the vicinity of the Watershed Lands is largely a function of air emissions from surrounding sources.

Area population centers include Burney, Cassel, Fall River Mills, and Johnson Park. Growth in these population centers is moderate. Recreational use within the Shasta Regional Bundle is plentiful on FERC licensed areas and the Contiguous Watershed Lands, including Pacific Gas and Electric Company operated day-use areas and group campsites found near popular project reservoirs and streams. Sensitive receptors in the Shasta Regional Bundle area consist mainly of permanent residents and temporary and seasonal recreational users. Because of the lack of significant air quality concerns associated with Pacific Gas and Electric Company's hydroelectric facilities and Watershed Lands, air quality issues or complaints are rare.

Local Regulations and Policies

Regulation of air quality in the Shasta Regional Bundle varies depending on the local county and air quality management districts in which the different projects and Watershed Lands are located. The Shasta Regional Bundle is located within the Sacramento Valley Air Basin (SVAB), Shasta County Air Quality Management District (SCAQMD), and the Tehama County Air Pollution Control District (SCAPDC). Permitting requirements for equipment in this region vary from district to district. ICEs at the hydroelectric facilities in the Shasta Regional Bundle are exempt from permitting due to either the low frequency of operation or low amount of emissions generated by operation. In addition, the majority of Pacific Gas and Electric Company's portable equipment is exempt from registration with the California Air Resources Board because it does not meet the horsepower thresholds required for registration.

Sacramento Valley Air Basin

The Shasta Regional Bundle is located in the extreme northern end of the Sacramento Valley, which is part of the Sacramento Valley Air Basin (SVAB). The State Air Resources Board (ARB) has further divided this basin into two planning units called the Northern Sacramento Valley Planning Area (NSVPA) and the Broader Sacramento Planning Area. These divisions are based on the degree of pollutant transport from one area of the basin to another and the varying degrees of emissions within each area. The NSVPA is comprised of seven counties including Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba counties.

Shasta County Air Quality Management District

The Hat Creek 1 and 2 Project, Pit 1 Project, Pit 3, 4, and 5 Project, McCloud-Pit Project, and Kilarc-Cow Creek Project are the Shasta Regional Bundle facilities located within the Shasta County Air Quality Management District (SCAQMD), which is designated by law to adopt and enforce regulations to achieve and maintain ambient air quality standards for criteria pollutants. Among its responsibilities is the development and administration of Shasta County's Air Quality Attainment Plan (AQAP) that strives to achieve a five percent reduction in emissions per year for each nonattainment pollutant.

The Shasta County Air Quality Management District rules exempt non-emergency engines operating less than 200 hours per calendar year, or any emergency standby engine as approved by the Air Pollution Control Officer (APCO). Any engine rated by the manufacturer less than 50 brake horsepower (bhp) is also exempt if maintained to manufacturers specifications (CARB, 2000b). Currently, the only internal combustion engines found at Shasta Regional Bundle projects are maintained for emergency standby and are therefore exempt from regulation and permitting.

Tehama County Air Pollution Control District

Portions of the Battle Creek Project and the entire Manton Hydro Service Center fall within the Tehama County Air Pollution Control District (TCAPCD), which is designated by law to adopt and enforce regulations to achieve and maintain ambient air quality standards for criteria pollutants. There are no internal combustion engines that are currently subject to air district permit requirements at the Battle Creek Project or at the Manton Hydro Service Center.

4.14.4.2 DeSabra Regional Bundle**Regional Setting**

The DeSabra Regional Bundle area is located in the Northern Sacramento Valley Planning Area (NSVPA) of the Sacramento Valley Air Basin, the Mountain Counties Air Basin (MCAB), and the Northeast Plateau Air Basin (NPAB). The NSVPA is comprised of seven counties, including Butte and Tehama. The MCAB is comprised of nine counties, including Plumas. The NPAB is comprised of three counties, including Lassen. Butte County is within the jurisdiction of the Butte County Air Quality Management District, Tehama County is in the Tehama County Air Pollution Control District, Plumas County is in the Northern Sierra Air Quality Management District, and Lassen County is in the Lassen County Air Pollution Control District.

The amount of a given pollutant in the ambient atmosphere is determined by the amount of pollutant emitted and the atmosphere's ability to transport and dilute the pollutant. The environmental conditions of the northern Sacramento Valley contribute to adverse air quality. The Sacramento Valley, bordered by mountain ranges to the east and west, acts as a basin that traps pollution. Temperature inversions, which occur when surface air is trapped by an overlying layer of warmer

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air, exacerbate topographic effects. The transport of pollutants from large urban areas like the San Francisco Bay Area, Stockton, and Sacramento affects the NSVPA and NPAB. The region's adverse environmental conditions are coupled with increasing emissions due to growth and urbanization.

Climate

The climate of the DeSabra Regional Bundle is generally described in the subsection entitled Western Slopes of Sierra Nevada Mountain Range, which is located Section 4.14.3.1, above. Table 4.14-6 provides specific weather and climate data for the DeSabra Regional Bundle.

Air Quality Attainment Status

Pacific Gas and Electric Company's hydroelectric facilities and Associated Watershed Lands in the DeSabra Regional Bundle are located in Butte, Lassen, Tehama, and Plumas counties.

Table 4.14-7 provides the air quality attainment status of the four counties with regard to State and Federal ambient air quality standards (AAQS).

Table 4.14-6 Climate Data For the DeSabra Regional Bundle Projects

Station	Location	Elevation (feet)	Air Temperature (F°)		Period of Record for Temperature	Precipitation (inches)	Period of Record for Precipitation
			Average	Extremes			
Canyon Dam	NFFR, Hamilton Branch Project Area	4,515	47.0	-16-102	1937-1998	37.54	1907-1998
Quincy Ranger Station	Bucks Creek Project Area	3,408	50.0	-24-110	1937-1996	39.48	1921-1996
Bucks Creek Powerhouse	Bucks Creek Project Area	1,762	58.9	0-114	1959-1998	67.56	1928-1998
Paradise Weather Station	Rock Creek-Cresta Project Area, Poe Project Area	1,750	60.1	14-111	1957-1996	53.83	1957-1996
DeSabra	DeSabra Centerville Project Area, Lime Saddle Project Area	1,225	55.3	3-109	1937-1995	63.76	1904-1998
Oroville Dam	Coal Canyon Project Area	171	61.8	12-115	1937-1995	27.42	1942-1995

Source: Pacific Gas and Electric Company, October 1999. Proponent's Environmental Assessment, Application No. 99-09-053, Volume 4, page 7-78.

Table 4.14-7 Attainment Status of Counties within the DeSabra Regional Bundle

Air Basin/ County	O ₃		CO		NO ₂		PM ₁₀	
	State	Federal	State	Federal	State	Federal	State	Federal
Butte	T	NA	A	U/A	A	A	NA	U/A
Lassen	A	U/A	U	U/A	A	A	NA	U/A
Plumas	U	U/A	A	U/A	A	A	NA	U/A
Tehama	NA	U/A	U	U/A	A	A	NA	U/A

Source : CARB, 2000; EPA, 2000

Notes: A = Attainment; NA = Non Attainment; U = Unclassified; T = Transitional; U/A = Unclassified/Attainment

The ambient air quality in Butte County is in attainment for carbon monoxide and nitrogen dioxide, non-attainment for ozone, and classified as non-attainment for PM10 under the State standards. The county is in non-attainment for ozone but in attainment or unclassified for carbon monoxide and PM10 under Federal requirements.

The ambient air quality in Lassen County is in attainment for nitrogen dioxide and ozone, unclassified for carbon monoxide and non-attainment for PM10 under the State standards. Under Federal requirements, Lassen County is either unclassified or in attainment for ozone, carbon monoxide, and PM10.

The ambient air quality in Plumas County is unclassified in meeting the State standards for ozone. However, no ozone problems were detected in 1993-94 and it is reasonable to predict that Plumas County will achieve ozone attainment. The ambient air quality in Plumas County is in attainment for carbon monoxide and nitrogen dioxide and is classified as non-attainment for PM10 under the State standards. The county is in attainment or unclassified for ozone, carbon monoxide, nitrogen dioxide, and PM10 under the Federal requirements.

The ambient air quality in Tehama County, under State requirements, is classified as non-attainment for ozone and PM10, attainment for nitrogen dioxide, and is unclassified for carbon monoxide. Under Federal requirements, Tehama County ambient air quality is in attainment or unclassified for ozone, carbon monoxide, nitrogen dioxide, and PM10.

Sensitive Receptors

The majority of the DeSabra Regional Bundle is located in rural or remote areas. Some Watershed Lands may be located in areas near industry or where major transportation routes cross and, therefore, may have poorer air quality than at more remote locations. Air quality in the vicinity of the Watershed Lands is largely a function of air emissions from surrounding sources.

Area population centers include Chester, Quincy, Prattville, Westwood, Oroville, Chico, Berry Creek, Concow, Paradise, and Magalia. Growth in these population centers is moderate.

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Recreational use within the DeSabra Regional Bundle is plentiful, including Pacific Gas and Electric Company operated day-use areas and group campsites found near popular project reservoirs and streams. Sensitive receptors in the DeSabra Regional Bundle area consist mainly of permanent residents and temporary and seasonal recreational users. Because of the lack of significant air quality concerns associated with Pacific Gas and Electric Company's hydroelectric facilities and associated Watershed Lands, air quality issues or complaints are rare.

Local Regulations and Policies

Regulation of air quality in the DeSabra Regional Bundle varies depending on the local county and air quality management districts in which the different projects and Watershed Lands are located. The DeSabra Regional Bundle is located within the Sacramento Valley Air Basin (SVAB), Mountain Counties Air Basin (MCAB), Northeast Plateau Air Basin (NPAB) Butte County Air Quality Management District (BCAQMD), Lassen County Air Pollution Control District (LCAPCD), Tehama County Air Pollution Control District (SCAPDC), and the Northern Sierra Air Quality Management District (NSAQMD). Permitting requirements for equipment in this region vary from district to district. Internal combustion engines at the hydroelectric facilities in the DeSabra Regional Bundle are exempt from permitting due to either the low frequency of operation or low amount of emissions generated by operation. In addition, the majority of Pacific Gas and Electric Company's portable equipment is exempt from registration with the California Air Resources Board because it does not meet the horsepower thresholds required for registration.

Mountain Counties Air Basin

Portions of the DeSabra Regional Bundle are located in the Mountain Counties Air Basin (MCAB). The MCAB is comprised of the counties of Plumas, Sierra, Nevada, Placer, El Dorado, Amador, Calaveras, Tuolumne and Mariposa. The basin includes those counties within the Sierra Nevada Mountain Range, which have a climate distinct from the neighboring Northeast Plateau, Sacramento Valley, San Joaquin Valley and Great Basin Valleys air basins to the north, west, south and east, respectively.

Sacramento Valley Air Basin

Portions of the DeSabra Regional Bundle are located in the northeastern portion of the Sacramento Valley, which is part of the Sacramento Valley Air Basin (SVAB). The State Air Resources Board (ARB) has further divided this basin into two planning units called the Northern Sacramento Valley Planning Area (NSVPA) and the Broader Sacramento Planning Area. These divisions are based on the degree of pollutant transport from one area of the basin to another and the varying degrees of emissions within each area. The NSVPA is comprised of seven counties including Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba counties.

Northeast Plateau Air Basin

Portions of the DeSabra Regional Bundle are located in southwestern Lassen County, which is in the extensively rural Northeast Plateau Air Basin (NPAB). The NPAB is comprised of the counties of Lassen, Siskiyou, and Modoc. This basin has a climate distinct from the neighboring Mountain Counties to the south, Sacramento Valley to the south and west, and the North Coast to the west.

Northern Sierra Air Quality Management District

The Upper North Fork Feather River Project, Bucks Creek Project, Rock Creek-Cresta Project, Hamilton Branch Powerhouse, Prattville Weather Station, and Rodgers Flat and Canyon Dam Service Centers are DeSabra Regional Bundle facilities located within the Northern Sierra Air Quality Management District (NSAQMD). The Rock Creek-Cresta facility is located in both NSAQMD and the Butte County Air Quality Management District. The NSAQMD rules exempt stationary internal combustion engines fired with natural gas or liquefied petroleum gas or those having 1,000 cubic inches cylinder displacement or less and fired with diesel oil or gasoline (CARB, 2000b). Any internal combustion engines at hydroelectric projects within the jurisdiction of NSAQMD are propane fired or have a cylinder displacement smaller than 1,000 cubic inches and are therefore exempt from regulation and permitting.

Butte County Air Quality Management District

The Poe Project, DeSabra-Centerville Project, Lime Saddle Powerhouse, Coal Canyon Powerhouse, and Camp 1 Service Center are DeSabra Regional Bundle facilities located within the Butte County Air Quality Management District (BCAQMD). The BCAQMD policies exempt non-emergency engines operating less than 200 hours per calendar year, or any emergency standby engine with a less than 250 brake horsepower (bhp) engine rating. Any engine rated by the manufacturer as less than 50 bhp is also exempt if an authority to construct is granted by the Air Pollution Control Officer (APCO) (CARB, 2000b). Except at the Poe Dam facility where permits are in the application review process for engines, internal combustion engines at hydroelectric projects within the jurisdiction of BCAQMD are either not subject to air district permit requirements or are exempt because they are utilized for emergency standby.

Lassen County Air Pollution Control District

The Mountain Meadows Land Area of the Hamilton Branch Bundle (Bundle 5) falls within the Lassen County Air Pollution Control District (LCAPCD). This land area has no air emission issues.

Tehama County Air Pollution Control District

A small DeSabra Regional Bundle Watershed Land parcel along Deer Creek falls within the Tehama County Air Pollution Control District (TCAPCD), which is designated by law to adopt and

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enforce regulations to achieve and maintain ambient air quality standards for criteria pollutants. The approximately 160-acre parcel has no air emission issues.

4.14.4.3 Drum Regional Bundle

Regional Setting

The Drum Region is split between the Mountain Counties Air Basin (MCAB) (eastern Placer, Nevada, and El Dorado counties) the North Coast Air Basin (NCAB) (Mendocino County). Placer County is within the jurisdiction of the Placer County Air Pollution Control District, Nevada County is in the Northern Sierra Air Quality Management District (NSAQMD), El Dorado County is in the El Dorado County Air Pollution Control District (EDCAPCD), Mendocino County is in the Mendocino County Air Quality Management District (MCAQMD), Lake County is in the Lake County Air Quality Management District (LCAQMD), and Yuba County is in the Feather River Air Quality Management District (FRAQMD).

Climate

The climate of the Sierra Nevada Mountain Range portion of the Drum Region is described in subsection Western Slopes of Sierra Nevada, which is in Section 4.14.3.1. The climate of the Eel and Russian River Coastal Ranges is described in subsection Eel and Russian River Coastal Ranges in Section 4.14.3.1. Table 4.14-8 provides specific weather and climate data for this region.

Table 4.14-8 Climate Data For the Drum Regional Bundle

Station	Project Area	Elevation (ft)	Air Temperature (F°)		Period of Record for Temperature	Precipitation (inches)	Period of Record for Precipitation
			Average	Extremes			
Lake Spaulding	Drum-Spaulding	5,014	47.6	-14 – 104	1948-1998	69.54	1894-1998
Blue Canyon	Drum-Spaulding	5,280	50.7	2 – 97	1948-1998	239 (snowfall)	1970
Nevada City	Drum-Spaulding	2,781	53.4	Not Available	1995	55.95	1995
Auburn	Drum-Spaulding	1,292	60.2	Not Available	1995	35.0	1995
Englebright Dam	On North Fork Yuba River, upstream of Narrows	531	Not Available	Not Available	Not Available	39.92	1954-1998
Placerville	Several miles south of Chili Bar	1,850	56.6	8 – 110	1948-1995	39.61	1904-1998
Potter Valley	Within the fenced yard outside of Potter Valley Powerhouse	1,020	57.6	0 – 116	1948-1998	43.97	1910-1998

Source: Pacific Gas and Electric Company, October 1999. Proponent's Environmental Assessment, Application No. 99-09-053, Volume 5, page 9-58.

Air Quality Attainment Status

A summary of the air quality attainment status within Placer, Nevada, El Dorado, Mendocino, Lake, and Yuba counties, is provided in Table 4.14-9.

Table 4.14-9 Attainment Status of Counties within the Drum Regional Bundle

Air Basin/ County	O ₃		CO		NO ₂		PM10	
	State	Federal	State	Federal	State	Federal	State	Federal
Placer	NA	Severe NA	U/A	U/A	A	A	NA	U/A
Nevada	NA	A	U/A	U/A	A	A	NA	U/A
El Dorado	NA	Severe NA	U/A	U/A	A	A	NA	U/A
Mendocino	A	A	A	U/A	A	A	NA	U/A
Lake	A	A	A	U/A	A	A	A	U/A
Yuba	NA	Severe NA	U	U/A	A	A	NA	UA

Source: CARB, 2000; EPA, 2000

Notes: A = Attainment; NA = Non Attainment; U = Unclassified; U/A = Unclassified Attainment

The ambient air quality in Placer County is in attainment for carbon monoxide, nitrogen dioxide, and is non-attainment for ozone and PM10 under the State standards; and the county is in attainment or unclassified for carbon monoxide, nitrogen dioxide, and PM10 and is in non-attainment (severe) for ozone under the Federal requirements.

The ambient air quality in Nevada County is in attainment for nitrogen dioxide, unclassified for carbon monoxide, and is in non-attainment for ozone and PM10 under the State standards, but the county is in attainment or unclassified for all pollutants under the Federal requirements.

The ambient air quality in El Dorado County is in attainment for nitrogen dioxide, unclassified for carbon monoxide, and is in non-attainment for ozone and PM10 under the State standards. The county is in non-attainment for ozone but is in attainment or unclassified for carbon monoxide, nitrogen dioxide, and particulate matter under Federal requirements.

The ambient air quality in Mendocino County is in attainment for carbon monoxide, nitrogen dioxide, and ozone and is in non-attainment for PM10 under the State standards; and the county is in attainment or unclassified for all pollutants under the Federal requirements.

The ambient air quality in Lake County is in attainment or unclassified for all pollutants under both State and Federal standards.

The ambient air quality in Yuba County is in attainment for nitrogen dioxide, unclassified for carbon monoxide and is in non-attainment for ozone and PM10 under the State standards. The county is in non-attainment for ozone but is in attainment for carbon monoxide, nitrogen dioxide, and PM10 under Federal requirements.

Sensitive Receptors

In general the areas around the Drum-Spaulding Project are sparsely populated, although the Wise 1 and 2 facilities and the Rock Creek Yard are located in the town of Auburn. Other facilities are also near Auburn, and the population surrounding this portion of the Drum-Spaulding Project area is growing rapidly. Recreational uses near the Drum-Spaulding Project boundary include day use areas and group camps. The areas around the Narrows Project and the Chili Bar Project are sparsely populated. There are private residences and a number of developed campgrounds in the vicinity of the Potter Valley Project.

Local Regulations and Policies

The Drum Watershed Region is located within the Mountain County Air Basin, North Coast Air Basin, and Sacramento Valley Air Basin. Permitting requirements for equipment in this region vary for the six air districts that regulate the land area of the Drum Regional Bundle.

Placer County Air Pollution Control District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Northern Sierra Air Quality Management District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

El Dorado County Air Pollution Control District

Pacific Gas and Electric Company owns one ICE at the Chili Bar Project that is within El Dorado County. This ICE is permitted with EDCAPCD (EDCAPCD, 2000b).

Mendocino County Air Quality Management District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Lake County Air Quality Management District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Feather River Air Quality Management District

No project land areas within Yuba County have any air quality emission sources subject to permitting by the Feather River Air Quality Management District.

4.14.4.4 Motherlode Regional Bundle

Regional Setting

The Motherlode Region facilities are located within the Mountain Counties Air Basin (MCAB), (Amador, Calaveras, Tuolumne, and Mariposa counties), the San Joaquin Valley Air Basin (SJVAB) (Merced County), and the Great Basin Valleys Air Basin (GBVAB) (Alpine County). Jurisdiction for these Counties is through the Amador County Air Pollution Control District (ACAPCD), Calaveras County Air Pollution Control District (CCAPCD), Tuolumne County Air Pollution Control District (TCAPCD), Mariposa County Air Pollution Control District (MCAPCD), San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) for Merced County, and Great Basin Unified Air Pollution Control District (GBUAPCD) for Alpine County.

Climate

The climate for the Motherlode Regional Bundle is generally described in the subsection entitled Western Slopes of Sierra Nevada, which is located subsection 4.14.3.1. Table 4.14-10 provides specific weather and climate data for this region.

Table 4.14-10 Climate Data For the Motherlode Regional Bundle

Station	Project Area	Elevation (ft)	Air Temperature (F°)		Period of Record for Temperature	Precipitation (inches)	Period of Record for Precipitation
			Average	Extremes			
Salt Springs Powerhouse	Mokelumne River	3,704	55.9	0 - 106	1976-1998	42.28	1928-1998
Tiger Creek Powerhouse	Mokelumne River	2,340	56.8	6 - 106	1976-1998	45.67	1907-1998
Hetch Hetchy	Spring Gap-Stanislaus	3,870	54.1	4 - 102	1977-1995	36.07	1930-1998
Calaveras Big Trees State Park	Phoenix	4,696	50.0	Not Available	1995	55.90	1930-1998
Merced Municipal Airport	Merced Falls	153	61.7	2 - 116	1897-1960	12.01	1869-1994
Tiger Creek Hydro Service Center	Mokelumne River	2,340	56.8	6 - 106	1976-1998	45.67	1907-1998

Source: Pacific Gas and Electric Company, October 1999. Proponent's Environmental Assessment, Application No. 99-09-053, Volume 6, page 11-58.

Air Quality Attainment Status

A summary of the air quality attainment status within Amador, Calaveras, Tuolumne, Mariposa, Merced, and Alpine counties is provided in Table 4.14-11.

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Table 4.14-11 Attainment Status of Counties within the Motherlode Regional Bundle

Air Basin/ County	O ₃		CO		NO ₂		PM10	
	State	Federal	State	Federal	State	Federal	State	Federal
Amador	NA	U/A	U	U/A	A	A	U	U/A
Calaveras	NA	U/A	U	U/A	A	A	NA	U/A
Tuolumne	NA	U/A	A	U/A	A	A	U	U/A
Mariposa	NA	U/A	U	U/A	A	A	NA	U/A
Merced	Severe NA	Serious ^a NA	U	U/A	A	A	NA	Serious NA
Alpine	U	U/A	U	U/A	A	A	NA	U/A

Source: CARB, 2000; EPA, 2000

Notes: A = Attainment; NA = Non Attainment; U = Unclassified

a. Merced County designation for the Federal ozone standard is pending severe.

The ambient air quality in Amador County is in attainment for nitrogen dioxide, unclassified for carbon monoxide and PM10, and is in non-attainment for ozone under the State standards. The county is in attainment or unclassified for all pollutants under the Federal requirements.

The ambient air quality in Tuolumne County is non-attainment for ozone, in attainment for carbon monoxide and nitrogen dioxide, and unclassified for PM10 under the State standards. The county is in attainment or unclassified for all pollutants under the Federal requirements.

The ambient air quality in Merced County is in non-attainment (Federal, serious, with pending severe designation) for ozone, in attainment or unclassified for carbon monoxide and nitrogen dioxide, and in non-attainment (Federal, serious) for PM10 under State and Federal requirements.

The ambient air quality in Calaveras County is in attainment or unclassified for carbon monoxide and nitrogen dioxide, and is in non-attainment for ozone and PM10 under the State standards. The county is in attainment or unclassified for all pollutants under the Federal requirements.

The ambient air quality in Mariposa County is in attainment or unclassified for carbon monoxide and nitrogen dioxide, and is in non-attainment for ozone and PM10 under the State standards. The county is in attainment or unclassified for all pollutants under the Federal requirements.

The ambient air quality in Alpine County is in attainment or unclassified for carbon monoxide, nitrogen dioxide and ozone, and is in non-attainment for PM10 under the State standards. The county is in attainment or unclassified for all pollutants under the Federal requirements.

Sensitive Receptors

In general the areas around each of the projects in this region are sparsely populated. Recreational uses within the project boundaries include resorts at Lower Bear River Reservoir and Strawberry Reservoir, day use areas and campgrounds. Around the Spring Gap-Stanislaus Project are camping

areas, resorts, and waterfront parcels at Strawberry Reservoir. There are also developed day use facilities in the vicinity of the Merced Falls Project.

Local Regulations and Policies

The Motherlode Watershed Region is located within the Mountain Counties Air Basin, the San Joaquin Valley Air Basin, and the Great Basin Valley Air Basin. Permitting requirements and planning goals vary between air districts.

Amador County Air Pollution Control District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Calaveras County Air Pollution Control District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Tuolumne County Air Pollution Control District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Mariposa County Air Pollution Control District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

San Joaquin Valley Unified Air Pollution Control District

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

Great Basin Unified Air Pollution Control District (GBUAPCD)

There are no Pacific Gas and Electric Company air quality sources in this project subject to air district permit requirements.

4.14.4.5 Kings Crane-Helms Regional Bundle

Regional Setting

The Kings Crane-Helm Regional Bundle is located in the San Joaquin Valley Air Basin (SJVAB). The SJVAB is comprised of all or part of eight counties, including lands and water in the Kings

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Crane-Helms Regional Bundle that are in Madera, Fresno, Tulare, and Kern counties. The entire air basin is within the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District.

The amount of a given pollutant in the ambient atmosphere is determined by the amount of pollutant emitted and the ability of the atmosphere to transport and dilute the pollutant. The San Joaquin Valley, bordered by mountain ranges to the east, west, and south, acts as a basin that traps pollution. Temperature inversions, which occur when surface air is trapped by an overlying layer of warmer air, exacerbate topographic effects. The transport of pollutants from large urban areas like the San Francisco Bay Area affects the SJVAB. The region's adverse environmental conditions are coupled with increasing emissions due to growth and urbanization.

Climate

The climate for the Kings Crane-Helms Regional Bundle is generally described in the subsection entitled Western Slopes of Sierra Nevada, which is located in subsection 4.14.3.1. Table 4.14-12 provides specific weather and climate data for this region.

Table 4.14-12 Climate Data For the Kings Crane-Helms Regional Bundle

Station	Project Area	Elevation (ft)	Air Temperature (F°)		Period of Record for Temperature	Precipitation (inches)	Period of Record for Precipitation
			Average	Extremes			
Auberry	Crane Valley & Kerckhoff Project Areas, Auberry Hydro Service Center	2,090	61.6	Not available	1931 to 1960	24.64	1931 to 1960
Huntington Lake	Helms Project Area	7,080	43.9	-18 to 89	1931 to 1960	37.99	1930 to 1998
Balch Powerhouse	Hass-Kings and Balch Project Areas	2,200	62.9	-8 to 110	1961 to 1984	30.01	1926 to 1998
Kern River 3 Powerhouse	Kern Canyon Project Area, Tule River Project Area	2,703	61.5	11 to 109	1936 to 1960	8.74	1916 to 1998

Source: Pacific Gas and Electric Company, October 1999. Proponent's Environmental Assessment, Application No. 99-09-053, Volume 7, page 13-69.

Air Quality Attainment Status

Pacific Gas and Electric Company's hydroelectric facilities in the Kings Crane-Helms Regional Bundle are in Fresno, Madera, Tulare Counties, and the western portion of Kern County, which are all within the San Joaquin Valley Air Basin (SJVAB), and are under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). A summary of the air quality status within the SJVAB, relative to meeting the National and State AAQS, is provided in Table 4.14-13. As indicated in Table 4.14-13, the SJVAB ozone level is in severe and serious nonattainment of the State and Federal AAQS, respectively. PM10 is in nonattainment and serious nonattainment of the State and Federal standards, respectively.

Table 4.14-13 Attainment Status of Counties within the Kings Crane-Helms Regional Bundle

Air Basin	O ₃		CO		NO ₂		PM10	
	State	Federal	State	Federal	State	Federal	State	Federal
SJVAB	Severe NA	Serious NA	A	U/A	A	U/A	NA	Serious NA

Notes: A = Attainment; NA = Nonattainment; U = Unclassified; U/A = Unclassified/Attainment

Source: SJVUAPCD, 2000.

Sensitive Receptors

The majority of the Kings Crane-Helms Regional Bundle and associated Watershed Lands is located in rural or remote areas. In general, the areas around this regional bundle are sparsely populated. Potential sensitive receptors are generally limited to temporary recreational users and Pacific Gas and Electric Company residences that are rented by Pacific Gas and Electric Company staff.

Local Regulations and Policies

The entire Kings Crane-Helms Regional Bundle is located within the SJVAB, which is under the jurisdiction of SJVUAPCD. The SJVUAPCD has adopted several attainment plans in an attempt to achieve State and Federal air quality standards. The SJVUAPCD must continuously monitor its progress in implementing attainment plans and must periodically report to the California Air Resources Board CARB and the USEPA. It must also periodically revise its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the California Clean Air Act (CCAA) and the Federal Clean Air Act Amendments of 1990 (FCAAA). The SJVUAPCD has submitted three ozone plans, three PM10 plans and a carbon monoxide attainment plan (SJVUAPCD, 1998).

4.14.5 STANDARDS OF SIGNIFICANCE

Each air quality management/control district establishes its own significance criteria based on the specific conditions in its jurisdiction. Individual Air Quality Management Districts and Air Pollution Control Districts establish guidelines and thresholds to determine significant adverse environmental impacts. The following significance criteria are based on these sources:

4.14.5.1 Project-Wide Significance Criteria

A significant impact would occur if the project were to cause an exceedance, or delay the attainment, of a California Ambient Air Quality Standard (CAAQS) or National Ambient Air Quality Standard (NAAQS). Potential exceedances or delays are controlled at the local level by standards set by the local air quality control agencies. Those standards are presented in the following section and are used to determine significance for the local bundles and regional bundles.

Local Significance Criteria

The following project emission significance criteria have been developed, either by regulation or policy (formally or informally), by the local air quality control agencies that regulate the project area (except those identified by table footnote to be that local agencies' NSR BACT or offset thresholds in lieu of a current formal or informal policy threshold). The criteria are for both stationary and mobile sources. Table 4.14-14 provides a summary of the significant emission thresholds identified for each district.

The emission significance threshold values presented in the table provide the values determined through conversation with the districts' staff. Informally, districts that do not have a written rule or policy governing emission significance thresholds often use their New Source Review (NSR) rule Best Available Control Technology (BACT) applicability thresholds as significance criteria for CEQA review. Therefore, for this project, when no specific emission significance thresholds are listed for a district, that district's NSR BACT thresholds are used as the emission significance threshold (except for SJVUAPCD where the NSR offset thresholds are used). The NSR BACT values are listed below district by district, as applicable, when those levels are being used as the significance thresholds for emissions for this project.

Table 4.14-14 Emission Significance Thresholds Summary

Local Air District	Pollutant				
	NO _x	VOC ^a	PM10	CO	SO ₂
Amador County APCD	See text below	See text below	See text below	See text below	See text below
Butte County AQMD	50 lbs/day	50 lbs/day	80 lbs/day	500/137 lbs/day ^b	80 lbs/day
Calaveras County APCD ^c	137 lbs/day	137 lbs/day	137 lbs/day	550 lbs/day	137 lbs/day
El Dorado County APCD ^d	10 lbs/day	10 lbs/day	80 lbs/day	550 lbs/day ^k	80 lbs/day ^k
Feather River AQMD ^m	25 lbs/day	25 lbs/day	80 lbs/day	500 lbs/day ^k	80 lbs/day ^k
Great Basin Unified APCD	150 lbs/day ^k	150 lbs/day ^k	150 lbs/day ^k	1,500 lbs/day ^k	150 lbs/day ^k
Lake County APCD ^e	150 lbs/day ^k	150 lbs/day ^k	150 lbs/day ^k	1,500 lbs/day ^k	150 lbs/day ^k
Lassen County APCD	150 lbs/day	150 lbs/day	150 lbs/day	550 lbs/day	150 lbs/day
Mariposa County APCD ^f	550 lbs/day	550 lbs/day	550 lbs/day	1,370 lbs/day	1,370 lbs/day
Mendocino County AQMD ^g	220 lbs/day ^k	220 lbs/day ^k	80 lbs/day ^k	550 lbs/day ^k	220 lbs/day ^k
Northern Sierra AQMD	See text below	See text below	See text below	1,000 lbs/day, 100 tons/yr ^k	1,000 lbs/day, 100 tons/yr ^k
Placer County APCD ^h	82 lbs/day	82 lbs/day	82 lbs/day	550 lbs/day	137 lbs/day
San Joaquin Valley Unified APCD ^{i,m}	10 tons/yr	10 tons/yr	80 lbs/day ^l	550 lbs/day ^l	220 lbs/day ^l
Shasta County APCD ^j	25 tons/yr	25 tons/yr	25 tons/yr	500 lbs/day ^k	80 lbs/day ^k
Tehama County APCD	25 lbs/day ^k	25 lbs/day ^k	80 lbs/day ^k	500 lbs/day ^k	80 lbs/day ^k
Tuolumne County APCD	1,000 lbs/day, 100 tons/yr	1,000 lbs/day, 100 tons/yr	1,000 lbs/day, 100 tons/yr	1,000 lbs/day, 100 tons/yr	1,000 lbs/day, 100 tons/yr

- a. For simplification, ROG (reactive organic compounds) and VOC (volatile organic compounds) are termed as VOC.
- b. 500 lbs/day for attainment areas, 137 lbs/day for non-attainment areas.
- c. Calaveras County anticipates adopting new significance thresholds of 137 lbs/day for all pollutants, except CO. The current significance threshold for all five pollutants is 550 lbs/day.
- d. El Dorado is currently using its NSR BACT thresholds as significance thresholds; however, in the future, it may conform with the Sacramento Metropolitan AQMD significance thresholds of 85 lbs/day for NO_x and VOC and 275 lbs/day for PM₁₀.
- e. Development in areas with serpentine rock (i.e. asbestos) may be a cause for a finding of significant impacts.
- f. Amador County APCD and the Northern Sierra AQMD significance thresholds have also been used for projects in Mariposa County.
- g. Formal policy thresholds are currently in the process of being developed for the different climatic regions of Mendocino County.
- h. The thresholds shown for Placer County are the County's current thresholds. It plans to standardize its thresholds with those being developed for the Sacramento Valley Air Basin (see following text description)
- i. See below for further description of the entire CEQA threshold policy for the San Joaquin Valley Unified APCD.
- j. Alternatively, for stationary sources, project significance thresholds in Shasta County may be set at the BACT trigger levels of 25 lbs/day for NO_x and VOC, 80 lbs/day for PM₁₀ and SO₂, and 500 lbs/day for CO.
- k. These significance thresholds are the respective local air quality agencies' NSR BACT thresholds.
- l. These significance thresholds are the SJVUAPCD NSR offset thresholds.
- m. FRAQMD and SJVUAPCD also have policy guidance on size of land development projects that are generally considered significant. The land development significance criteria are provided in the discussion for the two districts.

The following describes the significant emission thresholds by air district.

Amador County APCD

This district has different listed significance thresholds for area sources, line sources, combustion point sources and non-combustion point sources (Amador County APCD, 2000). The significance levels are provided below in Table 4.14-15.

Table 4.14-15 Amador County APCD Emission Significance Thresholds Summary

Source type	Pollutant				
	NO _x	VOC	PM ₁₀	CO	SO ₂
Area Sources ^a	17.0 lbs/day/√ac	34.0 lbs/day/√ac	6.4 lbs/day/√ac	485.1 lbs/day/√ac	17.0 lbs/day/√ac
Line Sources	347.9 lbs/day/mile	550 lbs/day/mile	130.5 lbs/day/mile	550 lbs/day/mile	347.9 lbs/day/mile
Combustion Point Sources	365.4 lbs/day	550 lbs/day	137 lbs/day	550 lbs/day	365.4 lbs/day
Non-combustion Point Sources	--	24.2 lbs/day	7.3 lbs/day	--	--

a. ac is per square root of the number of acres of the area source.

Source : Amador County, 1983

Butte County AQMD

This district applies its New Source Review BACT thresholds as significance thresholds (Butte County AQMD, 2000). These thresholds are 50 lbs/day for VOC and NO_x, 80 lbs/day for SO₂ and PM₁₀, and 550/137 lbs/day for CO attainment and non-attainment areas, respectively (CARB, 2000b).

Calaveras County APCD

This district has a significance threshold of 550 lbs/day (100 tons/year) for NO_x, VOC, PM₁₀, CO and SO₂. The district anticipates revising these thresholds to 137 lbs/day (25 tons/year) for all of these pollutants, except CO, which is likely to remain 550 lbs/day.

El Dorado County APCD

El Dorado is currently using its NSR BACT thresholds as significance thresholds (El Dorado APCD, 2000a). These levels are 10 lbs/day for NO_x and VOC, 80 lbs/day for PM₁₀ and SO₂ and 550 lbs/day for CO (CARB, 2000b).

This district may revise its significance thresholds to those determined by the Sacramento Metropolitan AQMD, which are being adopted by most of the air districts in the Sacramento Valley Air Basin. These limits are 85 lbs/day for VOC and NO_x, and 275 lbs/day for PM₁₀ (Sacramento Metropolitan AQMD, 2000). These thresholds are applied separately for three phases of a project. The first phase is defined as the initial grading and site preparation; the second phase is defined as the construction of roads, buildings, etc.; and the third phase is the operations phase of the project.

Feather River AQMD

The significant impact thresholds identified in the Feather River AQMD's indirect source review guidelines are 25 lbs/day for NO_x and VOC and 80 lbs/day for PM₁₀ (Feather River AQMD, 1998), which are the same as its NSR BACT thresholds. Feather River AQMD also unofficially uses its NSR BACT thresholds as significance thresholds for SO₂ (80 lbs/day) and CO (500 lbs/day) (Feather River AQMD, 2000a; CARB, 2000b).

Additionally, Feather River AQMD provides indirect source review guidelines that provide an estimated number of residential units that would be considered significant based on estimated ROG, NO_x and PM₁₀ emissions (Feather River AQMD, 1998). These numbers are based on operating emissions (traffic, fuel combustion sources, etc.) and not construction emissions. The estimated residential unit significance level, based on ROG emission estimates, is 97 single family homes. The complete list of estimated project size significance levels is provided in Table 4.14-16.

For the purposes of this project, the significance level of 97 dwelling units will be used as basis for significance for the land use development projects identified within FRAQMD jurisdiction.

Table 4.14-16 FRAQMD Indirect Source Project Size Significance Thresholds Summary

Land Use	Unit of Measure	Pollutant Based Project Size Significance Thresholds		
		ROG	NO _x	PM ₁₀
Light Industrial	1,000 GSF	143	156	4,000
Single Family Homes	D.U.	97	119	4,000
Apartments	D.U.	136	167	4,000

Table 4.14-16 FRAQMD Indirect Source Project Size Significance Thresholds Summary

Land Use	Unit of Measure	Pollutant Based Project Size Significance Thresholds		
		ROG	NOx	PM10
Elementary School	1,000 GSF	101	109	2,667
Small Office Building	1,000 GSF	52	57	1,600
Supermarket	1,000 GLA	6	7	195
Community Shopping Ctr.	1,000 GLA	21	22	615
Fast Food (no drive-thru)	1,000 GSF	1	2	44
Quality Restaurant	1,000 GSF	12	12	348
Walk-In Bank	1,000 GSF	8	9	242

GSF = Gross Square Feet; GLA = Gross Leasable Area; D.U. = Dwelling Unit

Great Basin Unified APCD

This district has not set significant emission thresholds for secondary emission sources. Each project is evaluated on a case-by-case basis; however, the district does have a PM10 concentration significance threshold of 50 ug/m³ above ambient for all new projects (Great Basin Unified APCD, 2000).

For this project, the Rule 216 “New Source Review Requirements for Determining Impacts to Air Quality” thresholds are used as emission significance thresholds. The Rule 216 thresholds are 15 lbs/hr or 150 lbs/day for all criteria pollutants, except CO, which is 150 lbs/hour and 1500 lbs/day (CARB, 2000b).

Lake County AQMD

This district has not set any significant emission thresholds. Each project is on a case-by-case basis (Lake County AQMD, 2000). District personnel did identify areas of serpentine rock (i.e. asbestos) as a concern that could potentially cause a finding of significance depending on the project type and location.

For this project, the LCAQMD NSR BACT thresholds are used as emission significance thresholds. The LCAQMD NSR BACT thresholds are 20 lbs/hr or 150 lbs/day for NOx, VOC, PM10, and SO₂; and 150 lbs/hour and 1500 lbs/day for CO (CARB, 2000b).

Lassen County APCD

Lassen County informally uses its NSR BACT thresholds as emission significance thresholds. These thresholds are 150 lbs/day for NOx, VOC, PM10, and SO₂; and 550 lbs/day for CO (Lassen County APCD, 2000).

Mariposa County APCD

Mariposa County generally uses its NSR BACT thresholds as emission significance thresholds (Mariposa County APCD, 2000). These thresholds are 550 lbs/day for NOx, VOC, and PM10; and 1,370 lbs/day for SO₂ and CO (CARB, 2000b). Amador County APCD and the Northern Sierra AQMD significance thresholds have also been used for projects in Mariposa County.

Mendocino County AQMD

This district is currently in the process of developing significant emission thresholds for the different climatic regions of the county. Currently, the district evaluates projects on a case-by-case basis (Mendocino County AQMD, 2000).

For this project, where all the project lands are in remote areas of Mendocino County, the MCAQMD NSR BACT thresholds are applied as emission significance thresholds for this project. The MCAQMD NSR BACT thresholds are 220 lbs/day for NOx, VOC, and SO₂; 80 lbs/day for PM10; and 550 lbs/day for CO (CARB, 2000b).

Northern Sierra AQMD

This district has a three-tiered approach to determination of significance with varying degrees of significance (Northern Sierra AQMD, 2000). Table 4.14-17 provides the emission significance thresholds.

Table 4.14-17 Northern Sierra AQMD Emission Significance Thresholds Summary

Significance Tier	Pollutant				
	NOx	VOC	PM10	CO	SO ₂
Level A	<25 lbs/day	<25 lbs/day	<80 lbs/day	--	--
Level B	Between Level A and B	Between Level A and B	Between Level A and B	--	--
Level C	137 lbs/day	137 lbs/day	137 lbs/day	--	--

Level A is the initial finding of significance where a minimal amount of mitigation is required for project approval. Exceeding the Level B and Level C thresholds requires mitigation measures for project approval.

For this project, the NSAQMD Major Source thresholds are used as SO₂ and CO emission significance thresholds (this district does not have specific BACT thresholds for attainment pollutants). The NSAQMD Major Source thresholds are 1000 lbs/day and 100 tons/year for SO₂ and CO (CARB, 2000b).

Placer County APCD

Placer County is currently using significance thresholds of 82 lbs/day for NOx, VOC and PM10; and 550 lbs/day for CO (Placer County APCD, 2000). For the purposes of this project, the

district's NSR BACT threshold for SO₂ (80 lbs/day) applies as a significance threshold (CARB, 2000b).

This district has plans to start using the significance thresholds determined by the Sacramento Metropolitan AQMD, which are being adopted by most of the air districts in the Sacramento Valley Air Basin. These limits are 85 lbs/day for VOC and NO_x, and 275 lbs/day for PM₁₀ (Sacramento Metropolitan AQMD, 2000). These thresholds are applied separately for three phases of a project. The first phase is defined as the initial grading and site preparation; the second phase is defined as the construction of roads, buildings, etc.; and the third phase is the operations phase of the project.

San Joaquin Valley Unified APCD

Project operations emission significance levels set by SJVUAPCD guidelines are 10 tons/yr for NO_x and VOC (SJVUAPCD, 1998). No specific significant emission levels have been set by the county for PM₁₀, SO₂ or CO. The NSR offset emission thresholds, which are more appropriate than using BACT thresholds for SJVUAPCD, for PM₁₀, SO₂ and CO are 80 lbs/day, 150 lbs/day and 550 lbs/day, respectively.

Shasta County APCD

Project significance levels set by Shasta County are 25 tons/year for NO_x, VOC, and PM₁₀. Alternatively, for stationary sources, Shasta County may set the project significance thresholds at the BACT trigger levels of 25 lbs/day for NO_x and VOC, 80 lbs/day for PM₁₀ and SO₂, and 500 lbs/day for CO (Shasta County APCD, 2000).

Tehama County APCD

This district has not set any significant emission thresholds, and evaluates each project on a case-by-case basis (Tehama County APCD, 2000).

For this project, the TCAPCD NSR BACT thresholds are used as emission significance thresholds. The TCAPCD NSR BACT thresholds are 25 lbs/day for NO_x and VOC; 80 lbs/day for PM₁₀ and SO₂; and 500 lbs/day for CO (CARB, 2000b).

Tuolumne County APCD

This district has a policy of using the new source review thresholds for stationary sources as the significant thresholds for project emissions (Tuolumne County APCD, 2000). These thresholds are 1,000 pounds per day and 100 tons/yr for NO_x, VOC, PM₁₀, SO₂, and CO. Additionally, the district has a PM₁₀ concentration significance threshold of 50 ug/m³ for all new projects.

4.14.6 ANALYTICAL METHODS

The air quality analysis includes the estimation of emission sources on the divested lands that may result as part of the transfer of ownership, the ancillary/secondary emissions from development resulting from the development of these divested lands, and the associated regional power plant emission increases or decreases that may result from the closing or changed operation of these hydroelectric plants. The following sections describe the analytical methods used to determine the potential emission sources that may occur as a result of the project.

Some direct impacts of changes in hydropower operations could result from physical changes such as construction of new service centers, switching centers, or communication facilities. Emissions caused by construction of such replacement facilities would be temporary. Changes in vehicle traffic could also be an operational change in hydropower operations. In total, such changes are expected to be minor in terms of and air quality emission increases, and are not further analyzed.

4.14.6.1 Emission Sources

This section identifies the existing emission sources located on the Pacific Gas and Electric Company properties that are part of the divestiture and the potential emission sources that may occur due to new ownership and property development.

Existing Emission Sources

Existing emission sources include facility operations; existing timber harvest; and existing mineral extraction activities. The existing emission sources make up the baseline emissions and baseline ambient concentrations impacts from the property sites. A description of each of the existing emission sources follows:

Facility Operations

Emission sources from facility (i.e., powerhouse, etc.) operations include emergency generators, maintenance emissions (painting, degreasing, construction necessary for facility upkeep, etc.), and employee trip traffic.

Timber Harvest

Currently, timber harvest operations occur at several areas that are part of the project. The project locations currently undergoing timber harvest and their current timber production levels are provided in the Air Quality Technical Appendix G.

Mineral Extraction

Currently, the Burney Mine located on Pacific Gas and Electric Company's Lake Britton property is the only mineral extraction operation on the proposed project sites. This open pit diatomaceous

earth mine is operated by the Calaveras Cement Company. When operating, the diatomaceous earth from this mine is loaded on trucks and trucked to the Calaveras Cement Company cement plant at Mountain Gate, where it is used as a high-purity silica additive in the manufacture of Portland cement. Currently, the mine is not in production (production was stopped in 1999); however, Calaveras Cement is maintaining the mine and has an interest in keeping this mine available for use at a later date (Calaveras Cement Company, 2000). The emissions from a new diatomaceous earth open pit mine were estimated from the historic operations of the Burney Mine (see the Air Quality Technical Appendix G).

Project Emission Sources

There are four identified potential project related emission source types that may occur as a result of the change of ownership and development of the project sites. These emission source types are residential/commercial property development (and associated emission sources), timber harvest, mineral extraction, and emissions from electricity generation due to changes in operation. As noted previously, the current emission sources located on, or associated with, the project properties are part of the baseline and not part of the project emission sources.

Land Development

The land development assumptions for the Watershed Land Areas are identified in terms of Equivalent Dwelling Units (EDUs) in Chapter 3. For the purpose of air quality emissions, one EDU is functionally equivalent to one residential unit. Emission sources from potential development include traffic emissions and area source emissions from the EDUs. The number of EDUs assumed to be developed for each project site area is provided in Chapter 3.

Timber Harvest

Timber harvest is assumed to continue and potentially expand as described in Chapter 3. Emissions from timber harvest include traffic emissions, including road dust, from lumber trucks and employee vehicles; heavy equipment emissions; and emissions from chain saws. The production and equipment assumption data for the project sites that would have increased timber production are provided in the Air Quality Technical Appendix G.

Mineral Extraction

There are only three areas with known potential for mineral extraction. These locations and their respective mineral deposits are shown in Table 4.14-19.

Of these known mineral deposits, only the Lake Britton/Pit River diatomaceous earth deposits, located in Shasta County, are considered a profitable resource likely to be mined. For emission estimating purposes, it is assumed that the production methods and peak production level for the currently inactive Burney Mine diatomaceous earth mining at Lake Britton occurs as a result of the

Table 4.14-19 Areas With Known Potential For Mineral Extraction

Known Mineral Deposits	Regional Bundle	Mineral
Pit River/Lake Britton	Shasta	Diatomaceous Earth
Pit River	Shasta	Sand and Gravel
Spring Gap	Motherlode	Quartz

project, whether by starting a new mine or through expansion of activities at the existing Burney Mine site at Lake Britton.

Power Plant Emissions

Changes in the operations of the hydroelectric facilities could impact fossil fuel fired power stations by changing load demand requirements. Changes in fossil fuel fired power plants operations can create emission increases or decreases depending on the time and amount of change in operation of the hydroelectric facilities.

4.14.6.2 Emission Estimation Methodology

Assumptions

Emission sources on the divested lands that may result from change of ownership include the development potential of suitable land areas, timber harvesting of suitable areas, and mineral extraction from specific areas of mineral wealth. The future project emissions have been determined based on the increase in each of the emission sources from baseline conditions.

Table 4.14-20 provides the general emission source input assumptions that were used in the development of the project emission estimates:

Table 4.14-20 Emission Source General Assumptions

Emission Source	Assumption
EDUs (Equivalent Dwelling Units)	Year Round Occupancy
Residential Combustion Sources	
Natural Gas/Propane (calculated as propane)	~72 MMBtu/unit/yr (equivalent to ~720 gallons/year)
Wood	~8 MMBtu/unit/yr (equivalent to ~1/2 ton of wood)
Trip Generation/Trip Length	9.57 Trip starts/day/unit / 10 miles per trip start

Table 4.14-20 Emission Source General Assumptions

Emission Source	Assumption
Timber Harvest Trip Generation Timber Trucks, Trip Length Employees, Passengers/Trip Employee Trips, Trip Length Site Pickup Trucks Harvesting Equipment Operation Heavy Equipment (diesel) Skidders Loader Road Cat Delimber Water Truck Chain Saws (gasoline)	12 Trip/50,000 BF/day, 75 Miles/Trip 12 Employees, 1.2 Passenger/Trip 10 Trips, 60 Miles/Trip 100 Miles/Day 8 Hours/Day, 50% Average Load 2 @ 160 hp 1 @ 214 hp 1 @ 165 hp 1 @ 165 hp EMFAC2000 Heavy Duty Diesel 4 @ 6 hp
Mineral Extraction Lake Britton Area Mineral Extracted Method Extracted Quantity Trip Generation Truck Trips/Trip Length Employee Trips/Trip Length Heavy Equipment Loader Dozer	Schedule - 7/24/365 Diatomaceous Earth Open Pit Mining 90,000 Tons/yea 10 Trips/day / 70 miles/trip 4 Trips/day / 40 miles/trip 16 Hours/Day @ 50% Average Load 1 @ 430 hp 1 @ 650 hp

Additional emission assumptions are provided in the Air Quality Technical Appendix G.

Calculations

Land Development

Emissions from miscellaneous EDU combustion sources were calculated using residential emission factors from AP-42 Volume 1. The number of units was multiplied by the factors for natural gas/propane emissions and wood combustion emissions. The emission factors from AP-42 for propane combustion were used rather than those for natural gas combustion as most of the potential units are remote and may not have natural gas service. The fuel usage factors and emission calculations are presented in the Air Quality Technical Appendix G.

The EDU vehicle fleet mix was calculated for each project area. The vehicle fleet mix for roadway traffic is presented in the Air Quality Technical Appendix G. Light duty autos and light duty trucks with catalytic converters generally make up the majority of the assumed vehicle fleet mix.

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The CARB mobile source emission model (EMFAC2000) was used to generate year 2005 emission factors for each vehicle class in grams per unit (i.e., hour, mile, or trip) for each criteria pollutant. The model was used to generate emission factors for the following types of emissions: running exhaust emissions, variable start emissions, and evaporative emissions, which consist of diurnal, hot soak, running, and resting losses. The average emission factors were determined using the average of the summer (75°F) and spring and fall (50°F) emission factors. AP-42 Volume 1 emission factors for entrained road dust were used to estimate fugitive dust emissions from paved and unpaved roads, as appropriate.

Assumptions for vehicle trips, trip distances, idle times, soak time between engine starts, and average travel speeds are presented in the Air Quality Technical Appendix G.

Timber Harvest

Timber harvest impacts on-road traffic emissions were calculated in the same manner as for equivalent development units. The on-road traffic assumptions and emission calculations are provided in the Air Quality Technical Appendix G.

The heavy equipment and hand held equipment emissions were developed based on assumptions necessary for a 50,000 bf/day (board feet/day) logging camp. The detailed operating assumptions and calculations are provided in the Air Quality Technical Appendix G.

Mineral Extraction

The only mineral extraction assumed to occur is diatomaceous earth on the Lake Britton property. The on-road traffic emissions were calculated in the same manner as for equivalent development units. The on-road traffic assumptions and emission calculations are provided in the Air Quality Technical Appendix G.

The heavy equipment exhaust and mining operation PM10 emissions were developed based on assumptions necessary for a 90,000 ton/year diatomaceous earth mine. The detailed operating assumptions and calculations are provided in the Air Quality Technical Appendix G.

Power Plant Emissions

Potential emission impacts from electric generators in California were estimated using the SERASYM™ chronologic production costing model.¹ SERASYM™ is used to simulate the operations of electric systems and to forecast, among other things, unit-specific electric generator operations, emissions and fuel requirements. In this application, the model (in all scenarios) was employed to simulate the California electric system as operated under the control of the California Independent System Operator. The purpose of using SERASYM™ was to identify the indirect air

¹ SERASYM™ is Copyrighted © 1989-2000 by Sierra Energy and Risk Assessment, Incorporated.

quality effects of the project. SERASYM™ used the output from the UPLAN model runs, which are described in Chapter 3 (Approach to Environmental Analysis) and Appendix C.

Two calendar years were simulated: 2000 and 2005. The amount of emissions of each of the five major criteria pollutants was estimated in each major California air basin and for the state as a whole. The five pollutants considered were NO_x, SO_x, reactive organic compounds (ROGs), CO and PM₁₀. In the single 2000 case simulated, the Baseline case provided emission estimates based upon the current electric system in California and the other regions of the interconnected Western Systems Coordinating Council (WSCC) grid. Consistent with the analyses in the other sections of Chapter 4, two project cases (the PowerMax and WaterMax Scenarios) were simulated in the year 2005. In addition, this air quality analysis includes modeled emission data for scenarios that have been run to analyze the potential effects of an owner having “market power” by owning hydroelectric powerhouses and fossil-fueled power plants. The analyses of market power analyzed how owners that own both types of power plants could change operations to influence prices, and thus maximize revenues. The market power scenarios analyzed in this section look at the Proposed Resource Case (MPProp Case) that has all of the proposed new power plants (about 11,000 MW) coming on-line in 2005 as was assumed for the PowerMax and WaterMax scenarios, and also analyzes a Moderate Resource Case (MPMod Case) that only has about half of the proposed new power plants (about 5,500 MW) coming on-line by 2005. The two market power cases analyzed selected months and systemwide emissions resulting from constant levels of generation by the hydroelectric powerhouses (baseload operations) compared to typical operations that cycle daily (load following operations). Both market power cases assume baseload operations for a new owner that has control of 2,241 MW (1,965 MW that can be shifted on- or off-peak) of Pacific Gas and Electric’s hydroelectric system. The modeling of these market power cases (the baseload operations) is presented in detail in Appendix C. In addition to changed daily operations the MPmod combines the market power implications of delayed power plant construction, by analyzing less future generation capacity.

The database as updated for this application came from two sources. Most of the WSCC data came from the database employed in the evaluation of the impacts of the Pacific Gas and Electric Company fossil plants divestiture reported in subject Environmental Impact Report (ESA 1998). This database was updated to reflect new information about existing and future WSCC electric generators. The key updates reflected the inclusion of all large generators that have active Applications for (siting) Certification (AFC) before the California Energy Commission (CEC) or have recently received their siting Certification from the CEC.

On-line dates for these plants as expected by the CEC vary from 2001 to 2003 so none were assumed available for the 2000 SERASYM™ simulation and, except for the MPMod Case, all were assumed present for the 2005 simulations. The MPMod Case assumed about 50 percent of the expected new plants would be operational by 2005 and the other 50 percent would either be delayed with a start date after 2005, or never would be constructed. In all cases, the expected facilities are

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nearly all comprised of highly efficient, gas fired combustion turbines with heat recovery steam boilers operating in combined cycle mode. These units are all required to be equipped with Best Available Control Technology (BACT) and so are assumed to be considerably cleaner than the existing generation even with retrofit pollution equipment. The fact that these planned units are both much cheaper to operate and cleaner, results in reduced emissions (for most air contaminants) in each of the 2005 scenarios as compared to emissions in the year 2000. The more inefficient existing power plants should be used less in the future or retired from the system, because newer (more-efficient) units will be used first.

The hourly operations of all of the non-pumped storage generation of the Pacific Gas and Electric Company hydro units being considered for divestiture was provided by LCG Consulting Corporation and are the outputs of their UPLAN model simulations. The operations of the three Helms pumped storage units, also being considered by this project, were modeled within SERASYM™ to reflect minimum cost operations consistent with their assumed continuing status as Reliability Must Run (RMR) units under the control of the ISO.

Emission Estimation Factors

Table 4.14-21 presents emission estimation factor sources that were used to develop the emission factors used to calculate the project emissions.

Table 4.14-21 Emission Estimation Factor Sources

Emission Source	Estimating Method/Reference
Equivalent Dwelling Units	AP-42 Sections 1.5, 1.9, and 1.10
On-Road Traffic Emission Factors	EMFAC2000
Road Dust Emission Factors	AP-42 Section 13.2
Heavy Equipment Emission Factors	EPA Report NR-009a
Non-Road Spark IC Engine Emission Factors	EPA Report NR-010a
Mineral Extraction/Processing Emissions	AP-42 Section 11.9
Powerplant Emissions	SERASYM™ chronologic production costing model ^a

a. SERASYM™ is Copyrighted © 1989-2000 by Sierra Energy and Risk Assessment, Incorporated.

Significance Determination

The project emissions calculated for each project in each regional bundle were compared to the significance thresholds (see Section 4.14.5) criteria to determine significance.

4.14.7 INTRODUCTION TO IMPACTS AND MITIGATION MEASURES

For Air Quality, the following impacts have been identified:

- Impact 14-1: Changes in hydroelectric operations could affect operations at other power plants (*Significant*).

- Impact 14-2: The project land development could contribute substantial emissions to the local air basin, which could cause the degradation of the local air quality conditions or would contribute to a new or existing violation of the National or State Ambient Air Quality Standards (*Significant*).

Most facilities associated with the proposed ownership transfer are located in rural areas and remote river canyons where air quality is usually excellent. Some facilities may be located in areas near industry or where major transportation routes cross and, therefore, may have poorer air quality than at more remote locations.

Hydroelectric power is generated by passing water through turbines rather than burning fossil fuels or utilizing natural geothermal steam. Therefore, hydroelectric generation does not consume fossil fuel or emit appreciable amounts of air pollutants. Sources of air emissions associated with conventional hydroelectric plant operations and maintenance can include vehicle exhaust, diesel or propane-powered stationary internal combustion engines, gas-powered portable generators, occasional burning of brush and debris, and the storage, dispensation, and use of materials containing volatile organic compounds (VOCs) (e.g., solvents, paints, etc.).

Vehicle exhaust is generated by cars, trucks, and heavy equipment used for project operations and maintenance. Vehicle trips are frequently made from service centers to hydroelectric facilities, including reservoirs, dams, spillways, canals, and powerhouses. There are less frequent trips to appurtenant facilities such as communication facilities and stream gaging stations. Diesel and propane-powered stationary internal combustion engines are used to provide power to batteries that provide backup power to powerhouses and facilities (station power) and communications systems when outside sources of power are disrupted. Under normal circumstances, internal combustion engines are used periodically to charge backup power batteries. During periods of outside power disruption, they are used in a constant mode to keep batteries charged while providing backup station and communication power. Gas-powered portable generators are used to provide power at remote work sites, including remote construction sites and emergency repair sites. As a result of their limited contribution to air emissions, air quality in the vicinity of hydroelectric facilities is largely a function of surrounding sources of emissions unrelated to hydroelectric operations.

The existing property emissions levels are considered to be the baseline conditions. Forecasted potential changes to the existing property conditions (i.e., development and changes in operation), and the associated emissions, are compared to the significance thresholds to determine project significance.

4.14.8 IMPACT 14-1: IMPACT, ANALYSIS, AND MITIGATION MEASURES

Impact 14-1: Changes in hydropower operations could affect operations at other power plants (*Significant*).

4.14.8.1 Evaluation of Impact 14-1 to Entire System

PowerMax and WaterMax Scenarios

New hydroelectric operators may revise how much power is produced during different seasons at these facilities. These changes in power management would affect the emissions potential of fossil-fuel fired generating stations in the Western United States. The emissions at other locations could be the indirect impact of changed hydropower operations. Power management scenarios and their resultant effect to California power station emissions in 2005 that could result from conditions found during the range of water years were modeled (as described in 4.16.6.2 “Power Plant Emissions”, and in more detail in Chapter 3 and Appendix C) and those results are provided in Table 4.14-22. More detailed results are provided in the Air Quality Appendix G.

Table 4.14-22 SERASYM™ Modeled California Thermal Power Plant Emissions (Using Water Years 1975-1998)

Pollutant	Condition	Power Plant Emissions (t/yr)			Emission Change (t/yr)	
		Baseline (2000)	PowerMax (2005)	WaterMax (2005)	PowerMax	WaterMax
VOC	Maximum	24,831	22,976	22,980	-1,545	-1,547
	Minimum	24,256	22,711	22,709	-1,856	-1,852
	Average	24,537	22,820	22,827	-1,718	-1,710
CO	Maximum	47,107	31,572	31,585	-13,090	-13,105
	Minimum	43,250	30,160	30,145	-15,534	-15,522
	Average	45,189	30,683	30,726	-14,506	-14,463
NOx	Maximum	102,535	91,375	91,360	-9,028	-9,044
	Minimum	99,513	90,485	90,469	-11,160	-11,174
	Average	100,940	90,828	90,844	-10,112	-10,096
PM10	Maximum	6,696	6,669	6,339	-205	-202
	Minimum	6,323	6,118	6,121	-357	-357
	Average	6,509	6,222	6,228	-287	-281
SOx	Maximum	6,017	6,309	6,310	302	307
	Minimum	5,879	6,166	6,166	279	282
	Average	5,944	6,234	6,236	290	292

The comparison presented in Table 4.14-22 includes the natural variability in the water years modeled for all of the cases. This comparison shows that the year 2005 scenarios are, considering modeling error, within the same range of pollutant emission values, and are predicted to have emissions that are significantly lower than the statewide base case for all pollutants except SO₂. The statewide increase in SO₂ emissions is approximately five percent. The increase in SO₂ emissions is correlated to increases in fuel that would be necessary to meet the projected statewide increases in electrical demand in 2005.

The emissions for all pollutants are predicted to increase within specific air basins; however, this is a function of the new power plants and power distribution changes within those air basins. The overall impact to any single air basin within California (see the Air Quality Technical Appendix G for additional detailed emission tables) would be minimal in comparison with each air basin's total pollutant emissions profile. Additionally, it is expected that the power plants in question would be operated within existing and forecasted future permit limitations without expectation of significant effects, as these permit limits would have been accounted for by the local air pollution control agencies in their respective air quality management plans. Therefore, based on the results of this modeling analysis, no significant air quality impacts are expected from the potential change in hydroelectric facility operations under the PowerMax or WaterMax Scenarios.

Market Power Analyses (MPProp and MPMoD Scenarios)

In the analyses of PowerMax and WaterMax Scenarios, the hydroelectric powerhouses were assumed to operate in a manner that would maximize revenues at individual powerhouses. The MPProp and MPMoD cases were model runs for cases in which operations would occur in a manner to influence the price of electricity. Electrical system modeling (as described in more detail in Appendix C) shows that an operator might accomplish this by providing a constant baseload from its hydroelectric facilities, rather than daily cycling (load following) to maximize profits from the hydroelectric facilities, while making up the difference during peak periods, and increasing total profits, by increasing the market clearing price and power output of its thermal plants during peak periods. In order to determine the potential air quality impact from such operations, the August emissions were modeled for three specific water years (1977; 1979; and 1998) with different characteristics, assuming that the hydroelectric facilities were baseloaded. Two new scenarios were modeled for evaluation, the first assuming all forecasted new power production facilities (~ 11,000 MW) come on line by 2005 (market power with Proposed Reservoir Case, "MPProp Case") and the second assuming that about 50 percent of these forecasted facilities are on line by 2005 (market power with Moderate Resource Case, "MPMoD Case"). The modeled August emissions are provided in Table 4.14-23.

The comparison presented above includes the variability for August in the three water years modeled for all of the cases. This comparison shows that the year 2005 MPProp and No Project Cases are, considering modeling error, within the same range of pollutant emission values, and are predicted to have emissions that are significantly lower than the statewide baseline for all pollutants.

The 2005 MPMoD case is predicted to have emissions that are significantly higher than the other two 2005 cases (MPProp and No Project), and is predicted to have marginally lower emissions than the statewide baseline for all pollutants in 2000, except for SO₂ which is predicted to be similar to the 2000 baseline.

**Table 4.14-23 SERASYM™ Modeled California Thermal Power Plant Emissions
(August Emissions Using Water Years 1977, 1979 and 1998)**

MPPollutant	Condition	Power Plant Emissions (tons/month)				MPMod – No Project	
		Baseline (8/2000)	MPProp (8/2005)	MPMod (8/2005)	No Project (8/2005)	Difference	Percent Change
VOC	Maximum	2,737	2,340	2,552	2,335	217	9
	Minimum	2,697	2,317	2,516	2,304	212	9
	Average	2,714	2,328	2,534	2,317	217	9
CO	Maximum	6,286	3,543	5,114	3,479	1,635	47
	Minimum	6,034	3,380	4,885	3,225	1,660	51
	Average	6,106	3,457	4,997	3,329	1,668	50
NOx	Maximum	11,194	8,924	9,457	8,914	543	6
	Minimum	10,961	8,875	9,343	8,842	501	6
	Average	11,039	8,898	9,400	8,872	528	6
PM10	Maximum	850	655	810	652	158	24
	Minimum	825	634	784	624	160	26
	Average	836	643	796	636	160	25
SOx	Maximum	646	601	642	600	42	7
	Minimum	628	592	633	591	42	7
	Average	639	596	638	595	43	7

The results of the four scenarios (PowerMax, WaterMax, MPProp, MPMod, and No Project) show that power plant emissions are higher as a statewide total in the baseline (2000) than they will be in any of the four future cases that were modeled for the operation of new owner(s). This is primarily due to the assumed new power plants that generate less air pollution than many of the existing power plants. While this is the case, power plant emissions could increase in individual air basins that have increased power plant production. While all the scenarios in this analysis indicate that emissions will be reduced (improve) in 2005, there is far less reduction in the MPMod scenario than the other scenarios. The MPMod case shows emissions would increase from six to 51 percent when compared to the No Project case for 2005. Since fossil-fueled power plants are major emission sources in many air basins, the future increases from the market power operations could delay attainment of air quality standards in some California Air Basins. This would be considered a *significant* impact.

4.14.8.2 Impact 14-1: Mitigation Measures

Mitigation Measures Proposed as Part of the Project

No mitigation measures have been identified.

Mitigation Measures Identified in This Report

Mitigation Measure 14.1: Measures acceptable to the CPUC shall be taken to prevent the exercise of market power by the new owner(s).

4.14.8.3 Impact 14-1: Level of Significance After Mitigation

Less than significant.

4.14.9 IMPACT 14-2: IMPACT, ANALYSIS, AND MITIGATION MEASURES

Impact 14-2: The project land development could contribute substantial emissions to the local air basin, which could cause the degradation of the local air quality conditions or would contribute to a new or existing violation of the National or State Ambient Air Quality Standards (*Significant*).

4.14.9.1 Impact 14-2: Shasta Regional Bundle

A total of approximately 38,439 acres of Watershed Lands are proposed for transfer to a new owner(s) in the Shasta Regional Bundle. The land development analysis (see Chapter 3) concludes that substantial rural and resort residential development within the Shasta Regional Bundle could occur in the Pit 1, Hat Creek, Pit 3, and Shingletown Land Areas. According to the land use analysis, as well as a forestry assumption analysis prepared for this project (see Chapter 3), timber management could also increase on transferred lands, especially in the Pit 3, 4, and 5, McCloud-Pit, and Battle Creek Land Areas. Additionally, there is the potential for mineral extraction (diatomaceous earth) at the Lake Britton Land Area.

The assumed developed land areas and their estimated emissions are provided in Tables 4.14-24a and 4.14-24b.

Land Development

Indirectly, increased land development (identified as Equivalent Dwelling Units [EDUs] in Chapter 3) would attract vehicles and their associated mobile emissions. In other words, while developed Watershed Lands may or may not be stationary sources of air pollutants, they attract vehicles, which emit air pollutants. Additionally, these new EDUs would have propane and wood combustion emissions.

Tables 4.14-24a and 4.14-24b show that the air emissions from the larger developments within Shasta County would be significant. Typically, in assessing project impacts, each separate (i.e., non-contiguous) development would normally be assessed separately by Shasta County in terms of being a source of significant impacts. The land areas with forecasted development are often large and would actually be comprised of many separate developments. The project applications would be submitted when the owner were to seek land use permits for a specific project. Therefore, there

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is the potential that all of the development activity would not be determined by the county to be significant on a development project by development project basis. However, this EIR is analyzing the combined effects of divesting all Pacific Gas and Electric Company Watershed Lands, not just the effects of separate elements of the project. In this context, all of the emissions in each air basin are considered together. Additionally, the construction activities for the larger developments have the potential to have temporary significant emission impacts. Because they are temporary and no details exist for the staging of construction, it would be speculative to estimate construction emissions. Based on experience from projects of similar size, however, construction impacts can be *significant*.

Timber Harvest

As stated above, the forestry assumptions conclude that the Pit 3, 4, and 5, McCloud-Pit, and Battle Creek Land Areas, under new ownership, could experience increased timber harvest of 2,100 acres, 1,000 acres, 900 acres, 2,400 acres, and 14,000 acres respectively (see Chapter 3). Pacific Gas and Electric Company is transferring all of its THPs and ongoing obligations under non-active THPs to the new owner(s). It is assumed the new owner(s) will continue timber management on the transferred property; the new owner will be required to comply with the THPs or submit subsequent THPs for review. Changes in timber management could affect air quality if increased vehicle traffic or equipment operation were to occur. Logging traffic could locally increase air emission impacts. New THPs and amendments to existing THPs would increase logging traffic on SR 299, SR 89, and SR 44, ultimately increasing air emission sources through towns adjacent to these major transportation routes.

No additional timber harvest is forecast for Shasta Regional Bundle lands within Tehama County.

Mineral Extraction

It is assumed that there is new or expanded diatomaceous earth mining at the Lake Britton site in the Shasta Regional Bundle. The emissions associated with this type of mining activity are limited to heavy equipment and on-road vehicle engine emissions, and earthmoving/mining/road travel fugitive dust emissions. No ore processing/refining is assumed to occur. The emissions calculated for this forecast mining activity exceed the significance thresholds for both NO_x and PM₁₀.

No additional mineral extraction activities are forecast for Shasta Regional Bundle Lands within Tehama County.

Summary of Impact 14-2: Entire Shasta Regional Bundle

As indicated on Table 4.14-23, Local Bundles 1, 2, and 4 exceed significance criteria for both daily and annual emissions. In Bundle 1, emissions would exceed annual criteria for ROG and PM₁₀, and daily criteria for CO. Bundle 2 would exceed annual criteria for ROG, NO_x, and PM₁₀, and

daily criteria for CO. Bundle 4 would exceed annual criteria for ROG, and PM10, and daily criteria for CO.

Based on the foregoing, the project would have a *significant* air quality effect on Local Bundles 1, 2, and 4, and therefore the entire Shasta Regional Bundle.

Table 4.14-24(a) Shasta Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				t/yr	t/yr	t/yr	t/yr	t/yr
Land Development								
Hat Creek	Bundle 1: Hat Creek	Shasta	594	33.44	264.30	19.92	37.41	0.26
Pit River 1	Bundle 2: Pit River	Shasta	714	40.19	317.69	23.94	44.97	0.31
McArthur Swamp	Bundle 2: Pit River	Shasta	17	0.96	7.56	0.57	1.07	0.01
Lake Britton	Bundle 2: Pit River	Shasta	264	14.86	117.46	8.85	16.63	0.11
Pit 3	Bundle 2: Pit River	Shasta	736	41.43	327.48	24.68	46.36	0.32
McCloud and Iron Canyon, Pit 4,5,6,7, and James B. Black PH	Bundle 2: Pit River	Shasta	95	5.35	42.27	3.19	5.98	0.04
Kilarc-Cow Creek	Bundle 3: Kilarc-Cow Creek	Shasta	20	1.13	8.90	0.67	1.26	0.01
Shingletown	Bundle 4: Battle Creek	Shasta	558	31.41	248.28	18.71	35.15	0.24
Inskip PH	Bundle 4: Battle Creek	Tehama	38	2.14	16.91	1.27	2.39	0.02
Timber Harvest								
Pit 3, 4 & 5 233	Bundle 2: Pit River	Shasta	--	0.34	3.10	2.04	5.82	0.04
McCloud-Pit 2106	Bundle 2: Pit River	Shasta	--	0.21	1.90	1.25	3.57	0.02
Kilarc-Cow Creek	Bundle 3: Kilarc-Cow Creek	Shasta	--	0.02	0.18	0.12	0.34	0.00
Battle Creek	Bundle 4: Battle Creek	Shasta	--	0.16	1.42	0.93	2.66	0.02
Mineral Extraction								
Lake Britton	Bundle 2: Pit River	Shasta	--	1.29	4.98	28.47	31.06	0.11
Totals								
Local Bundle Totals	Bundle 1: Hat Creek			33.44	264.30	19.92	37.41	0.26
	Bundle 2: Pit River			104.63	822.44	92.99	155.46	0.96
	Bundle 3: Kilarc-Cow Creek			1.15	9.08	0.79	1.60	0.01
	Bundle 4: Battle Creek			33.71	266.61	20.91	40.20	0.28
Regional Bundle Totals				172.93	1362.43	134.61	234.67	1.51
Significance Thresholds		Shasta	--	25	--	25	25	--
		Tehama	--	--	--	--	--	--

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria.

Table 4.14-24(b) Shasta Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				lb/day	lb/day	lb/day	lb/day	lb/day
Land Development								
Hat Creek	Bundle 1: Hat Creek	Shasta	594	183.21	1448.19	109.12	205.01	1.41
Pit River 1	Bundle 2: Pit River	Shasta	714	220.22	1740.76	131.17	246.43	1.69
McArthur Swamp	Bundle 2: Pit River	Shasta	17	5.24	41.45	3.12	5.87	0.04
Lake Britton	Bundle 2: Pit River	Shasta	264	81.42	643.64	48.50	91.12	0.63
Pit 3	Bundle 2: Pit River	Shasta	736	227.00	1794.40	135.21	254.02	1.75
McCloud and Iron Canyon, Pit 4,5,6,7, and James B. Black PH	Bundle 2: Pit River	Shasta	95	29.30	231.61	17.45	32.79	0.23
Kilarc-Cow Creek	Bundle 3: Kilarc-Cow Creek	Shasta	20	6.17	48.76	3.67	6.90	0.05
Shingletown	Bundle 4: Battle Creek	Shasta	558	172.10	1360.43	102.51	192.59	1.32
Inskip PH	Bundle 4: Battle Creek	Tehama	38	11.72	92.65	6.98	13.12	0.09
Timber Harvest^b								
Pit 3, 4 & 5 233	Bundle 2: Pit River	Shasta	--	11.98	109.31	71.99	205.26	0.43
McCloud-Pit 2106	Bundle 2: Pit River	Shasta	--	11.98	109.31	71.99	205.26	0.43
Kilarc-Cow Creek	Bundle 3: Kilarc-Cow Creek	Shasta	--	11.98	109.31	71.99	205.26	0.43
Battle Creek	Bundle 4: Battle Creek	Shasta	--	11.98	109.31	71.99	205.26	0.43
Mineral Extraction								
Lake Britton	Bundle 2: Pit River	Shasta	--	7.08	27.29	156.00	170.19	0.58
Totals								
Local Bundle	Bundle 1: Hat Creek			183.21	1,448.19	109.12	205.01	1.41
	Bundle 2: Pit River			594.22	4,697.77	635.43	2,210.91	5.78
	Bundle 3: Kilarc-Cow Creek			18.15	158.07	75.66	212.16	0.48
	Bundle 4: Battle Creek			195.8	1,562.39	181.48	410.97	1.84
Regional Bundle Totals				991.38	7,866.42	1,001.69	2,039.08	9.51
Significance Thresholds		Shasta	--	--	500	--	--	80
		Tehama	--	25	500	25	80	80

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria.

b. Timber harvest maximum daily emissions potential for each affected area is based on a 50,000 board foot per day logging camp.

4.14.9.2 Impact 14-2: DeSabra Regional Bundle

A total of approximately 44,600 acres of Watershed Lands are proposed for transfer to a new owner(s) in the DeSabra Regional Bundle. The land development analysis (see Chapter 3) concludes that substantial rural and resort residential development within the DeSabra Regional Bundle could occur, especially in the Southeast Lake Alamo and Coal Canyon/Thermalito Land Areas. According to the land use analysis, as well as a Forestry Assumption analysis prepared for this project (see Chapter 3), timber harvest could also increase on transferred lands, especially in the Upper North Fork Feather River and Bucks Creek Land Areas. No mineral extraction activities are forecast. The emissions estimated for the assumed potential development within this regional bundle are provided in Tables 4.14-25a and 4.14-25b.

Land Development

Tables 4.14-25a and 4.14-25b show that the air emissions from the larger developments within Plumas and Butte Counties would be significant. Typically, in assessing project impacts, each separate (i.e., non-contiguous) development would normally be assessed separately by the counties in terms of being a source of significant impacts. The land areas with forecasted development are often large and would actually be comprised of many separate developments. The project applications would be submitted when the owner were to seek land use permits for a specific project. Therefore, there is the potential that all of the development activity would not be determined by the county or counties to be significant on a development project by development project basis. However, this EIR is analyzing the combined effects of divesting all Pacific Gas and Electric Company Watershed Lands, not just the effects of separate elements of the project. In this context, all of the emissions in each air basin are considered together. Additionally, the construction activities for the larger developments have the potential to have temporary significant emission impacts. Because they are temporary and no details exist for the staging of construction, it would be speculative to estimate construction emissions. Based on experience from projects of similar size, however, construction impacts can be significant.

Timber Harvest

The forecast increased timber harvest appears to have the potential for short-term significant emission impacts based on the daily emissions significance criteria that are in place for Lassen County, Butte County, and Plumas County. No impacts are forecast for the Tehama County portion of the DeSabra Regional Bundle.

Mineral Extraction

No mineral extraction activities have been identified for the DeSabra Regional Bundle.

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Table 4.14-25(a) DeSabra Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				t/yr	t/yr	t/yr	t/yr	t/yr
Land Development								
Mountain Meadows Reservoir	Bundle 5: Hamilton Branch	Lassen	19	1.07	8.45	0.64	1.20	0.01
Hamilton Branch Powerhouse	Bundle 5: Hamilton Branch	Plumas	16	0.90	7.12	0.54	1.01	0.01
North Lake Alamo	Bundle 6: Feather River	Plumas	87	4.90	38.71	2.92	5.48	0.04
Southeast Lake Alamo	Bundle 6: Feather River	Plumas	615	34.62	273.64	20.62	38.74	0.27
Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				t/yr	t/yr	t/yr	t/yr	t/yr
West Lake Alamo/Prattville	Bundle 6: Feather River	Plumas	276	15.54	122.80	9.25	17.38	0.12
Butt Valley Reservoir	Bundle 6: Feather River	Plumas	92	5.18	40.93	3.08	5.79	0.04
Caribou to Belden PH	Bundle 6: Feather River	Plumas	16	0.90	7.12	0.54	1.01	0.01
Humbug Valley	Bundle 6: Feather River	Plumas	240	13.51	106.79	8.05	15.12	0.10
Rock Creek-Cresta	Bundle 6: Feather River	Plumas & Butte	19	1.07	8.45	0.64	1.20	0.01
Poe	Bundle 6: Feather River	Butte	31	1.74	13.79	1.04	1.95	0.01
Bucks Creek/Bucks Lake	Bundle 7: Bucks Creek	Plumas	244	13.73	108.57	8.18	15.37	0.11
DeSabra-Centerville	Bundle 8: Butte Creek	Butte	66	3.72	29.37	2.21	4.16	0.03
Coal Canyon/Thermalito Diversion Pool	Bundle 8: Butte Creek	Butte	378	21.28	168.19	12.67	23.81	0.16
Timber Harvest								
Hamilton Branch	Bundle 5: Hamilton Branch	Lassen	--	0.01	0.08	0.05	0.15	0.00
Upper North Fork Feather River	Bundle 6: Feather River	Plumas	--	0.13	1.16	0.76	2.17	0.01
Rock Creek-Cresta	Bundle 6: Feather River	Butte & Plumas	--	0.04	0.35	0.23	0.65	0.00
Poe	Bundle 6: Feather River	Butte	--	0.02	0.20	0.13	0.38	0.00
Bucks Creek	Bundle 7: Bucks Creek	Plumas	--	0.09	0.85	0.56	1.60	0.01
Totals								
Local Bundle Totals	Bundle 5: Hamilton Branch			1.98	15.68	1.23	2.36	0.02
	Bundle 6: Feather River			77.65	613.94	47.26	89.87	0.61
	Bundle 7: Bucks Creek			13.82	109.42	8.74	16.97	0.12
	Bundle 8: Butte Creek			25.0	197.56	14.88	27.97	0.19
Regional Bundle Totals				118.45	936.60	72.11	137.17	0.94
Significance Thresholds		Butte	--	--	--	--	--	--
		Plumas (NSAQMD)	--	--	100	--	--	100
		Lassen	--	--	--	--	--	--

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria

Table 4.14-25(b) DeSabra Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂	
				lb/day	lb/day	lb/day	lb/day	lb/day	
Land Development									
Mountain Meadows Reservoir	Bundle 5: Hamilton Branch	Lassen	19	5.86	46.32	3.49	6.56	0.05	
Hamilton Branch Powerhouse	Bundle 5: Hamilton Branch	Plumas	16	4.93	39.01	2.94	5.52	0.04	
North Lake Alamor	Bundle 6: Feather River	Plumas	87	28.83	212.11	15.98	30.03	0.21	
Southeast Lake Alamor	Bundle 6: Feather River	Plumas	615	189.68	1499.39	112.98	212.26	1.46	
West Lake Alamor/Prattville	Bundle 6: Feather River	Plumas	276	85.13	672.90	50.70	95.26	0.65	
Butt Valley Reservoir	Bundle 6: Feather River	Plumas	92	28.38	224.30	16.90	31.75	0.22	
Caribou to Belden PH	Bundle 6: Feather River	Plumas	16	4.93	39.01	2.94	5.52	0.04	
Humbug Valley	Bundle 6: Feather River	Plumas	240	74.02	585.13	44.09	82.83	0.57	
Rock Creek-Cresta	Bundle 6: Feather River	Plumas & Butte	19	5.86	46.32	3.49	6.56	0.05	
Poe	Bundle 6: Feather River	Butte	31	9.56	75.58	5.70	10.70	0.07	
Bucks Creek/Bucks Lake	Bundle 7: Bucks Creek	Plumas	244	75.26	594.88	44.83	84.21	0.58	
DeSabra-Centerville	Bundle 8: Butte Creek	Butte	66	20.36	160.91	12.12	22.78	0.16	
Coal Canyon/Thermalito Diversion Pool	Bundle 8: Butte Creek	Butte	378	116.59	921.58	69.44	130.46	0.90	
Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂	
				lb/day	lb/day	lb/day	lb/day	lb/day	
Timber Harvest^b									
Hamilton Branch	Bundle 5: Hamilton Branch	Lassen	--	11.98	109.31	71.99	205.26	0.43	
Upper North Fork Feather River	Bundle 6: Feather River	Plumas	--	11.98	109.31	71.99	205.26	0.43	
Rock Creek-Cresta	Bundle 6: Feather River	Butte & Plumas	--	11.98	109.31	71.99	205.26	0.43	
Poe	Bundle 6: Feather River	Butte	--	11.98	109.31	71.99	205.26	0.43	
Bucks Creek	Bundle 7: Bucks Creek	Plumas	--	11.98	109.31	71.99	205.26	0.43	
Totals									
Local Bundle Totals	Bundle 5: Hamilton Branch				22.77	194.64	78.42	217.34	0.52
	Bundle 6: Feather River				460.33	3,682.67	468.75	1,090.69	4.56
	Bundle 7: Bucks Creek				87.24	704.19	116.82	289.47	1.01
	Bundle 8: Butte Creek				136.95	1,082.49	81.56	153.24	1.06
Regional Bundle Totals					707.29	5,663.99	745.55	1,750.74	7.15
Significance Thresholds		Butte	--	50	500	50	80	80	
		Plumas (NSAQMD)	--	25	1,000	25	80	1,000	
		Lassen	--	150	550	150	150	150	

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria

b. Timber harvest maximum daily emissions potential for each affected area is based on a 50,000 board foot per day logging camp

Summary of Impact 14-2: Entire DeSabra Regional Bundle

As indicated on Tables 4.14-25a and 4.14-25b, all the local bundles (5, 6, 7, and 8) exceed significance criteria for either daily or annual emissions. Bundle 5 would exceed daily criteria for CO and PM10. Bundle 6 would exceed annual criteria for CO, and daily criteria for ROG, CO, NO_x, and PM10. Bundle 7 would exceed annual criteria for CO, and daily criteria for ROG, CO, NO_x, and PM10. Bundle 8 would exceed the daily criteria for ROG, CO, NO_x, and PM10.

Based on the foregoing, the project would have a *significant* air quality effect on Local Bundles 5, 6, 7, and 8, and therefore the entire Shasta Regional Bundle.

4.14.9.3 Impact 14-2: Drum Regional Bundle

A total of approximately 18,900 acres of Watershed Lands are proposed for transfer to a new owner(s) in the Drum Regional Bundle. The land development analysis (see Chapter 3) concludes that substantial rural and resort residential development within the Drum Regional Bundle could occur in the Lake Valley Reservoir, Lake Spaulding/Drum Penstock Forebay, Dutch Flat-Bear River North of Rollins Reservoir, and Halsey Forebay/Lake Arthur Land Areas. According to the land use analysis, as well as a Forestry Assumption analysis prepared for this project (see Chapter 3), timber harvest could also increase on the Potter Valley and Drum-Spaulding Old and New Land Areas. No mineral extraction activities are forecast. The emissions estimated for the assumed potential development within this regional bundle is provided in Tables 4.14-26a and 4.14-26b.

Land Development

Tables 4.14-26a and 4.14-26b show that the larger developments within Nevada and Placer Counties have the potential to have significant emission impacts. Typically, in assessing project impacts, each separate (i.e., non-contiguous) development would normally be assessed separately by the counties in terms of being a source of significant impacts. The land areas with forecasted development are often large and would actually be comprised of many separate developments. The project applications would be submitted when the owner were to seek land use permits for a specific project. Therefore, there is the potential that all of the development activity would not be determined by the county to be significant on a development project by development project basis. However, this EIR is analyzing the combined effects of divesting all Pacific Gas and Electric Company Watershed Lands, not just the effects of separate elements of the project. In this context, all of the emissions in each air basin are considered together. Additionally, the construction activities for the larger developments have the potential to have temporary significant emission impacts. Because they are temporary and no details exist for the staging of construction, it would be speculative to estimate construction emissions. Based on experience from projects of similar size, however, construction impacts can be significant.

Table 4.14-26(a) Drum Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				t/yr	t/yr	t/yr	t/yr	t/yr
Land Development								
Narrows-Lake Englebright	Bundle 9: North Yuba River	Nevada & Yuba	3	0.17	1.33	0.10	0.19	0.00
Potter Valley-Van Arsdale Reservoir/Potter Valley PH	Bundle 10: Potter Valley	Mendocino	13	0.73	5.78	0.44	0.82	0.01
Lake Pillsbury	Bundle 10: Potter Valley	Lake	188	10.58	83.65	6.30	11.84	0.08
Kidd Lake/Cascade Lakes	Bundle 11: South Yuba River	Nevada & Placer	38	2.14	16.91	1.27	2.39	0.02
Meadow Lake/Fordyce Lake/Lake Sterling/White Rock Lake	Bundle 11: South Yuba River	Nevada & Placer	7	0.39	3.11	0.23	0.44	0.00
Rock Lake/Lindsey Lakes	Bundle 11: South Yuba River	Nevada	5	0.28	2.22	0.17	0.31	0.00
Lake Valley Reservoir	Bundle 11: South Yuba River	Nevada & Placer	329	18.52	146.39	11.03	20.72	0.14
Lake Spaulding/Drum Penstock Forebay	Bundle 11: South Yuba River	Nevada & Placer	2396	134.87	1066.08	80.33	150.92	1.04
Dutch Flat-Bear River North of Rollins Reservoir	Bundle 11: South Yuba River	Nevada & Placer	517	29.10	230.03	17.33	32.56	0.22
Rollins Reservoir/Bear River	Bundle 11: South Yuba River	Placer	12	0.68	5.34	0.40	0.76	0.01
Halsey Forebay/Lake Arthur	Bundle 11: South Yuba River	Placer	357	20.09	158.84	11.97	22.49	0.15
Rock Creek Lake/Auburn	Bundle 11: South Yuba River	Placer	198	11.15	88.10	6.64	12.47	0.09
Folsom Lake	Bundle 11: South Yuba River	Placer	4	0.23	1.78	0.13	0.25	0.00
American River-Chili Bar/Slab Creek Reservoir	Bundle 12: Chili Bar	El Dorado	4	0.23	1.78	0.13	0.25	0.00
Timber Harvest								
Potter Valley	Bundle 10: Potter Valley	Mendocino	--	0.39	3.58	2.36	6.73	0.05
Drum-Spaulding - Old & New	Bundle 11: South Yuba River	Nevada & Placer	--	0.36	3.32	2.18	6.23	0.04
Totals								
Local Bundle Totals	Bundle 9: North Yuba River			0.17	1.33	0.10	0.19	0.00
	Bundle 10: Potter Valley			11.70	93.01	9.10	19.39	0.14
	Bundle 11: South Yuba River			217.81	1,722.12	131.68	249.54	1.71
	Bundle 12: Chili Bar			0.23	1.78	0.13	0.25	0.00
Regional Bundle Totals				229.91	1818.24	141.01	269.37	1.85
Significance Thresholds			Nevada (NSAQMD)	--	100	--	--	100
			Placer	--	--	--	--	
			El Dorado	--	--	--	--	
			Mendocino	--	--	--	--	
			Lake	--	--	--	--	
			Yuba (FRAQMD)	97	--	--	--	--

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria.

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Table 4.14-26(b) Drum Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				lb/day	lb/day	lb/day	lb/day	lb/day
Land Development								
Narrows-Lake Englebright	Bundle 9: North Yuba River	Nevada & Yuba	3	0.93	7.31	0.55	1.04	0.01
Potter Valley-Van Arsdale Reservoir/Potter Valley PH	Bundle 10: Potter Valley	Mendocino	13	4.01	31.69	2.39	4.49	0.03
Lake Pillsbury	Bundle 10: Potter Valley	Lake	188	54.98	458.35	34.54	64.89	0.45
Kidd Lake/Cascade Lakes	Bundle 11: South Yuba River	Nevada & Placer	38	11.72	92.65	6.98	13.12	0.09
Meadow Lake/Fordyce Lake/Lake Sterling/White Rock Lake	Bundle 11: South Yuba River	Nevada & Placer	7	2.16	17.07	1.29	2.42	0.02
Rock Lake/Lindsey Lakes	Bundle 11: South Yuba River	Nevada	5	1.54	12.19	0.92	1.73	0.01
Lake Valley Reservoir	Bundle 11: South Yuba River	Nevada & Placer	329	101.47	802.11	60.44	113.55	0.78
Lake Spaulding/Drum Penstock Forebay	Bundle 11: South Yuba River	Nevada & Placer	2396	738.99	5841.54	440.17	826.95	5.68
Dutch Flat-Bear River North of Rollins Reservoir	Bundle 11: South Yuba River	Nevada & Placer	517	159.46	1260.47	94.98	178.44	1.23
Rollins Reservoir/Bear River	Bundle 11: South Yuba River	Placer	12	3.70	29.26	2.20	4.14	0.03
Halsey Forebay/Lake Arthur	Bundle 11: South Yuba River	Placer	357	110.11	870.38	65.58	123.21	0.85
Rock Creek Lake/Auburn	Bundle 11: South Yuba River	Placer	198	61.07	482.73	36.37	68.34	0.47
Folsom Lake	Bundle 11: South Yuba River	Placer	4	1.23	9.75	0.73	1.38	0.01
American River-Chili Bar/Slab Creek Reservoir	Bundle 12: Chili Bar	El Dorado	4	1.23	9.75	0.73	1.38	0.01
Timber Harvest^b								
Potter Valley	Bundle 10: Potter Valley	Mendocino	--	11.98	109.31	71.99	205.26	0.43
Drum-Spaulding - Old & New	Bundle 11: South Yuba River	Nevada & Placer	--	11.98	109.31	71.99	205.26	0.43
Totals								
Local Bundle Totals	Bundle 9: North Yuba River			0.93	7.31	0.55	1.04	0.01
	Bundle 10: Potter Valley			73.97	599.35	108.92	274.64	0.91
	Bundle 11: South Yuba River			1,203.43	9,527.46	781.65	1,538.54	9.60
	Bundle 12: Chili Bar			1.23	9.75	0.73	1.38	0.01
Regional Bundle Totals				1,279.56	10,0143.9	891.85	1,815.60	10.53
Significance Thresholds		Nevada (NSAQMD)	--	25	1,000	25	80	1,000
		Placer	--	82	550	82	82	137
		El Dorado	--	10	550	10	80	80
		Mendocino	--	220	550	220	80	550
		Lake	--	150	1,500	150	150	150
		Yuba (FRAQMD)	--	25	500	25	80	80

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria.

b. Timber harvest maximum daily emissions potential for each affected area is based on a 50,000 board foot per day logging camp.

Timber Harvest

The forecast increased timber harvest appears to have the potential for short-term significant emission impacts based on the daily emissions significance criteria that are in place for Nevada and Placer counties, and is expected to exceed the significance thresholds that Mendocino County is currently developing, assuming they are at or below their current NSR BACT thresholds.

Mineral Extraction

No mineral extraction activities have been identified for the Drum Regional Bundle.

Summary of Impact 14-2: Entire Drum Regional Bundle

As indicated in Tables 4.14-26a and 4.14-26b, annual CO emissions associated with Land Areas in Bundle 11 would exceed the significance criteria, triggering a significant impact. Annual emissions associated with Bundles 9, 10, and 12 are considered less than significant. With regard to daily emissions, Land Areas in Bundle 10 would exceed the significance thresholds that Mendocino County is currently developing, assuming they are at or below their current NSR BACT thresholds. Land Areas in Bundle 11 would trigger significant ROG, CO, NO_x, and PM₁₀ impacts. Land Areas associated with Bundles 9 and 12 are not anticipated to create significant impacts.

Based on the foregoing, the project would have a *significant* air quality effect in Local Bundles 10 and 11, and therefore the entire Drum Regional Bundle.

4.14.9.4 Impact 14-2: Motherlode Regional Bundle

A total of approximately 6,900 acres of Watershed Lands are proposed for transfer to a new owner(s) in the Motherlode Regional Bundle. The land use analysis (see Chapter 3) concludes that rural and resort residential development within the Motherlode Regional Bundle could occur, especially in the Lake Tabeaud/Electra Power House Land Area. According to the land use analysis, as well as a Forestry Assumption analysis prepared for this project (see Chapter 3), timber harvest could also increase, especially on the Mokelumne Land Area. No mineral extraction activities are forecast. The emissions estimated for the assumed potential development within this regional bundle is provided in Tables 4.14-27a and 4.14-27b.

Land Development

Tables 4.14-27a and 4.14-27b show that the Lake Tabeaud/Electra PH development within Amador County has the potential to have significant emission impacts depending on the acreage of the development area. Typically, in assessing project impacts, each separate (i.e., non-contiguous) development would normally be assessed separately by the counties in terms of being a source of significant impacts. The land areas with forecasted development are often large and would actually be comprised of many separate developments. The project applications would be submitted when the owner were to seek land use permits for a specific project. Therefore, there is the potential that

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all of the development activity would not be determined by the county to be significant on a development project by development project basis. However, this EIR is analyzing the combined effects of divesting all Pacific Gas and Electric Company Watershed Lands, not just the effects of separate elements of the project. In this context, all of the emissions in each air basin are considered together. Additionally, the construction activities for the larger developments may have the potential to have temporary significant emission impacts. Because they are temporary and no details exist for the staging of construction, it would be speculative to estimate construction emissions. Based on experience from projects of similar size, however, construction impacts can be significant.

The minimal development levels identified for Alpine, Calaveras, Merced, Mariposa, and Tuolumne Counties are not considered to have the potential for significant impacts.

Timber Harvest

The forecast increased timber harvest appears to have the potential for short-term significant emission impacts based on the daily emissions significance criteria that are in place for Amador County and those that are forecast to be in place for Calaveras County.

Mineral Extraction

No mineral extraction activities have been identified for the Motherlode Regional Bundle.

Summary of Impact 14-2: Entire Motherlode Regional Bundle

As indicated in Tables 4.14-27a and 4.14-27b, annual emissions associated with Land Areas of all of the bundles within the Motherlode Region are anticipated to create less than significant impacts. With regard to daily emissions, Land Areas within Bundle 13 would create CO and PM10 emissions that exceed the significance criteria, triggering significant impacts. Land Areas in Bundles 14 and 15 are not anticipated to trigger significant impacts.

Based on the foregoing, the project would have a *significant* air quality effect on Local Bundle 13, and therefore the entire Motherload Regional Bundle.

4.14.9.5 Impact 14-2: Kings Crane-Helms Regional Bundle

A total of approximately 4,300 acres of Watershed Lands are proposed for transfer to a new owner(s) in the Kings Crane-Helms Regional Bundle. The land use analysis (see Chapter 3) concludes that substantial rural and resort residential development within the Kings Crane-Helms Regional Bundle could occur, especially in the Manzanita Lake Land Area. According to the land use analysis, as well as a Forestry Assumption analysis prepared for this project (see Chapter 3), timber harvest could also marginally increase on the Crane Valley and Helms land areas. No mineral extraction activities are forecast. The emissions estimated for the assumed potential development within this regional bundle is provided in Tables 4.14-28a and 4.14-28b.

Table 4.14-27(a) Motherlode Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				t/yr	t/yr	t/yr	t/yr	t/yr
Land Development								
Mokelumne River-Tiger Creek Reservoir and Facilities	Bundle 13: Mokelumne River	Amador & Calaveras	11	0.62	4.89	0.37	0.69	0.00
Mokelumne River-Electra Tunnel/West Point PH	Bundle 13: Mokelumne River	Amador & Calaveras	5	0.28	2.22	0.17	0.31	0.00
Lake Tabeaud/Electra PH	Bundle 13: Mokelumne River	Amador & Calaveras	150	8.44	66.74	5.03	9.45	0.06
Bear River Reservoir/Lower Bear River Reservoir/Salt Springs	Bundle 13: Mokelumne River	Amador	38	2.14	16.91	1.27	2.39	0.02
Upper and Lower Blue Lakes/Meadow Lake/Twin Lake	Bundle 13: Mokelumne River	Alpine	67	3.77	29.81	2.25	4.22	0.03
Stanislaus River	Bundle 14: Stanislaus River	Tuolumne	37	2.08	16.46	1.24	2.33	0.02
Lyons Reservoir/Phoenix Reservoir	Bundle 14: Stanislaus River	Tuolumne	10	0.56	4.45	0.34	0.63	0.00
Merced Falls	Bundle 15: Merced River	Merced & Mariposa	1	0.06	0.44	0.03	0.06	0.00
Timber Harvest								
Mokelumne	Bundle 13: Mokelumne River	Amador & Calaveras	--	0.10	0.89	0.58	1.67	0.01
Spring Gap	Bundle 14: Stanislaus River	Tuolumne	--	0.01	0.09	0.06	0.17	0.00
Phoenix	Bundle 14: Stanislaus River	Tuolumne	--	0.01	0.13	0.09	0.25	0.00
Totals								
Local Bundle Totals	Bundle 13: Mokelumne River			15.35	121.46	9.67	18.73	0.12
	Bundle 14: Stanislaus River			2.66	21.13	1.73	3.38	0.02
	Bundle 15: Merced River			0.06	0.44	0.03	0.06	0.00
Regional Bundle Totals				18.07	143.03	11.43	22.17	0.14
Significance Thresholds	Amador		--	--	--	--	--	--
	Calaveras		--	--	--	--	--	--
	Alpine (GBUAPCD)		--	--	--	--	--	--
	Mariposa		--	--	--	--	--	--
	Merced (SJVUAPCD)		--	10	--	10	--	--
	Tuolumne		--	100	100	100	100	100

a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria

Table 4.14-27(b) Motherlode Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				lb/day	lb/day	lb/day	lb/day	lb/day
Land Development								
Mokelumne River-Tiger Creek Reservoir and Facilities	Bundle 13: Mokelumne River	Amador & Calaveras	11	3.39	26.82	2.02	3.80	0.03
Mokelumne River-Electra Tunnel/West Point PH	Bundle 13: Mokelumne River	Amador & Calaveras	5	1.54	12.19	0.92	1.73	0.01
Lake Tabeaud/Electra PH	Bundle 13: Mokelumne River	Amador & Calaveras	150	46.26	365.71	27.56	51.77	0.36
Bear River Reservoir/Lower Bear River Reservoir/Salt Springs	Bundle 13: Mokelumne River	Amador	38	11.72	92.65	6.98	13.12	0.09
Upper and Lower Blue Lakes/Meadow Lake/Twin Lake	Bundle 13: Mokelumne River	Alpine	67	20.66	163.35	12.31	23.12	0.16
Stanislaus River	Bundle 14: Stanislaus River	Tuolumne	37	11.41	90.21	6.80	12.77	0.09
Lyons Reservoir/Phoenix Reservoir	Bundle 14: Stanislaus River	Tuolumne	10	3.08	24.38	1.84	3.45	0.02
Merced Falls	Bundle 15: Merced River	Merced & Mariposa	1	0.31	2.44	0.18	0.35	0.00
Timber Harvest^b								
Mokelumne	Bundle 13: Mokelumne River	Amador & Calaveras	--	11.98	109.31	71.99	205.26	0.43
Spring Gap	Bundle 14: Stanislaus River	Tuolumne	--	11.98	109.31	71.99	205.26	0.43
Phoenix	Bundle 14: Stanislaus River	Tuolumne	--	11.98	109.31	71.99	205.26	0.43
Totals								
Local Bundle Totals	Bundle 13: Mokelumne River			95.55	770.03	121.78	298.78	1.08
	Bundle 14: Stanislaus River			38.45	333.21	152.62	426.74	0.97
	Bundle 15: Merced River			0.31	2.44	0.18	0.35	0.00
Regional Bundle Totals				134.31	1,105.68	274.58	725.87	2.05
Significance Thresholds	Amador^c		--	34	485.1	17	6.4	17
	Calaveras		--	137	550	137	137	137
	Alpine (GBUAPCD)		--	150	1,500	150	150	150
	Mariposa		--	550	1,370	550	550	1,370
	Merced (SJVUAPCD)		--	--	500	--	80	220
Tuolumne		--	1,000	1,000	1,000	1,000	1,000	

- a. Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria
- b. Timber harvest maximum daily emissions potential for each affected area is based on a 50,000 board foot per day logging camp.
- c. Amador County Significance Thresholds are in lbs/day/√ac (√ac = square root of project acreage).

Land Development

Tables 4.14-28a and 4.14-28b show that the Manzanita Lake development within Madera County has the potential to have significant CO and PM10 emission impacts. Typically, in assessing project impacts, each separate (i.e., non-contiguous) development would normally be assessed separately by the

SJVUAPCD in terms of being a source of significant impacts. The land areas with forecasted development are often large and would actually be comprised of many separate developments. The project applications would be submitted when the owner were to seek land use permits for a specific project. Therefore, there is the potential that all of the development activity would not be determined by the county to be significant on a development project by development project basis. However, this EIR is analyzing the combined effects of divesting all Pacific Gas and Electric Company Watershed Lands, not just the effects of separate elements of the project. In this context, all of the emissions in each air basin are considered together. Additionally, the construction activities for the larger developments may have the potential to have temporary significant emission impacts. Because they are temporary and no details exist for the staging of construction, it would be speculative to estimate construction emissions. Based on experience from projects of similar size, however, construction impacts can be significant.

Timber Harvest

The forecast increased timber harvest appears to have the potential for short-term significant emission impacts based on the emissions significance criteria that are in place for SJVUAPCD.

Mineral Extraction

No mineral extraction activities have been identified for the Kings Crane-Helms Regional Bundle.

Summary of Impact 14-2: Kings Crane-Helms Regional Bundle

As indicated in Tables 4.14-28a and 4.14-28b, annual ROG and NOx emissions associated with Land Areas in Bundle 16 would exceed the significance criteria, triggering significant impacts. Annual emissions associated with Land Areas in Bundles 17 through 20 are not anticipated to trigger significant impacts. With regard to daily emissions, CO and PM10 emissions associated with Land Areas in Bundle 16 would trigger significant impacts. Land Areas in Bundle 18 would create daily PM10 emissions that exceed significance criteria, triggering a significant impact. Daily emissions associated with Bundles 17, 19, and 20 are not expected to trigger significant air quality impacts.

Based on the foregoing, the project would have a significant effect on Bundles 16 and 18, and therefore the entire Kings Crane-Helms Regional Bundle.

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Table 4.14-28(a) Kings Crane-Helms Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				t/yr	t/yr	t/yr	t/yr	t/yr
Land Development								
Bass Lake	Bundle 16: Crane Valley	Madera	104	5.85	46.27	3.49	6.55	0.05
Manzanita Lake	Bundle 16: Crane Valley	Madera	246	13.85	109.46	8.25	15.49	0.11
San Joaquin PH #2	Bundle 16: Crane Valley	Madera	24	1.35	10.68	0.80	1.51	0.01
A.G. Wishon PH	Bundle 16: Crane Valley	Madera	6	0.34	2.67	0.20	0.38	0.00
Kerckhoff Reservoir	Bundle 17: Kerckhoff	Madera & Fresno	91	5.12	40.49	3.05	5.73	0.04
Auberry Service Center	Bundle 17: Kerckhoff	Fresno	2	0.11	0.89	0.07	0.13	0.00
Wishon Reservoir	Bundle 18: Kings River	Fresno	150	8.44	66.74	5.03	9.45	0.06
Keller Ranch	Bundle 18: Kings River	Fresno	3	0.17	1.33	0.10	0.19	0.00
Tule River	Bundle 19: Tule River	Tulare	45	2.53	1.33	1.51	2.83	0.02
Kern Canyon	Bundle 20: Kern Canyon	Kern	30	1.69	13.35	1.01	1.89	0.01
Timber Harvest								
Crane Valley	Bundle 16: Crane Valley	Madera	--	0.01	0.06	0.04	0.11	0.00
Helms	Bundle 18: Kings River	Fresno	--	0.01	0.10	0.07	0.19	0.00
Totals								
Local Bundle Totals	Bundle 16: Crane Valley			21.40	169.14	12.78	24.04	0.17
	Bundle 17: Kerckhoff			5.23	41.38	3.12	5.86	0.04
	Bundle 18: Kings River			8.62	68.17	5.20	9.83	0.06
	Bundle 19: Tule River			2.53	20.02	1.51	2.83	0.02
	Bundle 20: Kern Canyon			1.69	13.35	1.01	1.89	0.01
Regional Bundle Totals				39.47	312.06	23.62	44.45	0.3
Significance Thresholds		All (SJVUAPCD)		10	--	10	--	--

a Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria

Table 4.14-28(b) Kings Crane-Helms Regional Bundle Development Emissions Summary^a

Land Area	Bundle	County	Units	ROG	CO	NOx	PM10	SO ₂
				lb/day	lb/day	lb/day	lb/day	lb/day
Land Development								
Bass Lake	Bundle 16: Crane Valley	Madera	104	32.08	253.56	19.11	35.89	0.25
Manzanita Lake	Bundle 16: Crane Valley	Madera	246	75.87	599.76	45.19	84.90	0.58
San Joaquin PH #2	Bundle 16: Crane Valley	Madera	24	7.40	58.51	4.41	8.28	0.06
A.G. Wishon PH	Bundle 16: Crane Valley	Madera	6	1.85	14.63	1.10	2.07	0.01
Kerckhoff Reservoir	Bundle 17: Kerckhoff	Madera & Fresno	91	28.07	221.86	16.72	31.41	0.22
Auberry Service Center	Bundle 17: Kerckhoff	Fresno	2	0.62	4.88	0.37	0.69	0.00
Wishon Reservoir	Bundle 18: Kings River	Fresno	150	46.26	365.71	27.56	51.77	0.36
Keller Ranch	Bundle 18: Kings River	Fresno	3	0.93	7.31	0.55	1.04	0.01
Tule River	Bundle 19: Tule River	Tulare	45	13.88	109.71	8.27	15.53	0.11
Kern Canyon	Bundle 20: Kern Canyon	Kern	30	9.25	73.14	5.51	10.35	0.07
Timber Harvest^b								
Crane Valley	Bundle 16: Crane Valley	Madera	--	11.98	109.31	71.99	205.26	0.43
Helms	Bundle 18: Kings River	Fresno	--	11.98	109.31	71.99	205.26	0.43
Totals								
Local Bundle Totals	Bundle 16: Crane Valley			129.18	1,035.77	141.8	336.4	1.33
	Bundle 17: Kerckhoff			28.69	226.74	17.09	32.10	0.22
	Bundle 18: Kings River			59.17	482.33	100.10	258.07	0.80
	Bundle 19: Tule River			13.88	109.71	8.27	15.53	0.11
	Bundle 20: Kern Canyon			9.25	73.14	5.51	10.35	0.07
Regional Bundle Totals				240.17	1,927.69	272.77	652.45	2.53
Significance Thresholds		All (SJVUAPCD)		--	500	--	80	220

a Land area development emissions that are shown in bold type and shaded cells are above the listed emission significance criteria.

b Timber harvest maximum daily emissions potential for each affected area is based on a 50,000 board foot per day logging camp.

4.14.9.6 Evaluation of Impact 14-2 to Entire System

The combined emissions estimated from the assumed land development are forecast to exceed various significance criteria for emissions within each of the five regional bundles. Mitigation measures that can be used to minimize the emission impacts are addressed in the following section.

4.14.9.7 Impact 14-2: Mitigation Measures

Mitigation Measures Proposed as Part of the Project

No mitigation methods were identified as part of the project.

Mitigation Measures Identified in This Report

Mitigation Measure 14.2: Prior to approval of any new land use development or expansion of timber harvest or mineral extraction activities on Project Lands within Bundles 1,2,4,5,6,7,8,10,11,13, 16, and 18, an Air Quality Mitigation Plan shall be prepared for implementation during construction and operation of the proposed development in order to mitigate air quality impacts. Such plan shall address each of the following components:

Dust Suppression

General dust suppression mitigation measures that must be used (as appropriate) for land development, timber harvest and mining include the following:

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities (i.e., active construction areas) shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- Apply water or soil stabilizers as needed to unpaved parking lots, staging areas and roads, and, as feasible, pave all access roads.
- Apply approved chemical soil stabilizers, or vegetative cover, to exposed earth surfaces in inactive construction areas.
- Enclose, cover, water, or apply soil binders to exposed stock piles (i.e. sand, gravel, dirt).
- Replace ground cover in disturbed areas as quickly as possible.
- Limit dust generating activities during periods of high winds (over 15 mph).
- Install wind breaks at windward side(s) of construction areas.
- Wheel washers shall be installed where project vehicles and/or equipment exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

- Paved streets shall be swept (water sweeper with reclaimed water recommended) at the end of each day if substantial volumes of soil material have been carried onto adjacent paved, public roads from the project site.
- Limit vehicle speeds to 15 mph on unpaved roads (construction and other impacted traffic).
- Post signage with contact information and/or local Air District's phone number for the public.
- All trucks hauling dirt, sand, soil, or other loose material should be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.
- Limit area subject to excavation, grading, and other construction activity at any one time.

General Construction

General construction mitigation for the land development to reduce the overall impact of construction activities (including the overall impact to traffic and associated traffic delay emissions), such as the following:

- Provide temporary traffic control as needed during all phases of construction to improve traffic flow, as deemed appropriate.
- Minimize construction-related activities disruptions to traffic flow during peak hours to the greatest feasible extent.
- Use available emissions offset credits to mitigate construction emissions that exceed significance thresholds.

Land Development. General mitigations for emissions from new land development to limit residential equipment emissions (i.e., water heaters, stoves, etc.) and associated vehicle emissions shall include strategies such as the following:

- Provide for the use of energy-efficient lighting and process systems such as, low-NOx water heaters, furnaces, and boiler units.
- Include installation of solar water heaters for at least 25 percent of the residential units, and orient buildings to take advantage of solar heating and natural cooling and use passive solar designs.
- Increase wall and attic insulation beyond Title 24 requirements.
- Limit the amount or type of woodburning device installed (i.e. EPA Phase II certified woodstoves instead of open hearth).
- Design streets to maximize pedestrian access to transit stops where feasible.
- Provide transit amenities, e.g., onsite/offsite bus turnouts, passenger benches, or shelters where deemed appropriate.
- Contribute to traffic-flow improvements (i.e., right-of-way, capital improvements, etc.) that reduce traffic congestion and do not significantly increase roadway capacity.

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- Equip residential structures with electric outlets in the front and rear of the structures to facilitate use of electrical lawn and garden equipment.
- Provide for, or contribute to, dedication of land for off-site bicycle trails linking the development to designated bicycle commuting routes in accordance with the regional Master Plans.
- Contribute to the provision of synchronized traffic signals on roadways impacted by the project, and as deemed necessary.
- Provide/contribute to pedestrian access between bus service and major transportation points within the project where deemed feasible.
- Include neighborhood park(s) or other recreational options, such as trails, within the development to minimize vehicle travel to off-site recreational uses.
- Incorporate mixed uses, where permitted by local development regulations, to achieve a balance of commercial, employment, and housing options within the project site (i.e., provide ancillary services within walking distance of the project (no further than 1,500 feet) such as cafeterias, health clubs, automatic tellers, post office, etc.).
- Include neighborhood telecommunications/telework infrastructure.

Heavy Equipment. Heavy equipment (i.e. graders, bulldozers, forestry machines, mining machinery, etc.) can emit large quantities of NO_x and PM₁₀. Mitigation methods, such as the following, shall be employed to reduce emissions from heavy equipment:

- All heavy equipment including, but not limited to, bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty equipment, will be properly maintained and the engines tuned to the engine manufacturer's specifications.
- Oxidizing soot filters shall be installed on all suitable heavy equipment construction equipment.
- A good faith effort shall be given to use available certified low-NO_x emission heavy-duty equipment; including alternative fueled construction equipment and electrically driven equivalents (provided they are not run via a portable generator set).
- Minimize equipment idling time (e.g., ten minute maximum).
- The hours of operation of heavy equipment and/or the amount of equipment in use shall be limited to minimize short-term impacts.
- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing of construction activity during the peak-hour of vehicular traffic on adjacent roadways.
- Implement activity management (e.g., rescheduling activities to reduce short-term impacts).

Alternate Mitigation Measure 14-2: As an alternative to Mitigation Measures 14-2, prior to or concurrent with the transfer of title for any bundle listed in Mitigation Measure 14-2, there shall be recorded against the Project Lands within the bundle conservation easements running with the land and (in a form and substance approved by the CPUC) precluding any further land use development, or expansion of timber harvest or mineral extraction activities.

4.14.9.8 Impact 14-2: Level of Significance After Mitigation

Implementation of Mitigation Measures 14-2 would reduce the level of air emissions in the areas of land development, mining and timber harvest, but the levels would probably not be reduced below the level of significance because of the size of the project and the numerous land development projects that could occur. If the land development occurs, the impact would be significant and unavoidable, primarily from vehicle emissions from the estimated land development. Alternative Mitigation Measure 14-2 would fully mitigate and eliminate altogether, the impact of air emissions, by eliminating the potential sources of air emissions.

4.14.10 REFERENCES

Amador County APCD, 1993. Guidelines for Assessing the Significance of Air Quality Impacts Under the California Environmental Quality Act and the Amador County Air Pollution Control District Rules and Regulations. June.

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