8.1 Air Quality

This subsection describes existing air quality conditions, maximum potential impacts from the project, and mitigation measures that keep these impacts below thresholds of significance. The project will use combined-cycle generation technology to generate electricity in a manner that will minimize the amount of fuel needed, emissions of criteria pollutants, and potential effects on ambient air quality.

Other beneficial environmental aspects of the project that minimize adverse air quality include the following:

- Clean-burning natural gas as fuel
- Selective catalytic reduction (SCR) and ultra low NO_x combustors to minimize NO_x emissions
- Oxidation catalyst to reduce carbon monoxide (CO) and volatile organic compound (VOC) emissions
- Appropriately-sized stacks to reduce ground-level concentrations of exhaust constituents

This subsection presents the methodology and results of the air quality analyses performed to assess potential impacts associated with air emissions from project construction. Potential public health risks posed by emissions of non-criteria pollutants are addressed in Subsection 8.6, Public Health.

Subsection 8.1.1 presents the air quality setting, including geography, topography, climate, and meteorology. Subsection 8.1.2 provides an overview of air quality standards and health effects. Subsection 8.1.3 discusses the criteria pollutants and existing air quality in the vicinity of the proposed project. The affected environment is described in Subsection 8.1.4; air quality regulatory agencies relevant to the project are identified; and the LORS that can affect the project and project conformance are also identified in Subsection 8.1.4. Subsection 8.1.5 analyzes the environmental consequences of emissions from the project and describes the procedures used in assessing facility emissions and air quality impacts. The health risk assessment, visibility screening analysis, and construction impacts analysis are also discussed in that subsection. Subsection 8.1.6 discusses compliance with LORS applicable to the project. An analysis of cumulative impacts is presented in Subsection 8.1.7. Mitigation for project air quality impacts is discussed in Subsection 8.1.8. A list of references used in preparing the subsection is provided in Subsection 8.1.9.

8.1.1 Air Quality Setting

8.1.1.1 Geography and Topography

The proposed project will be located near the center of the City of Vernon at 5001 Soto Street. The City of Vernon is located in south-central Los Angeles County, about 5 miles south of downtown Los Angeles and 3.5 miles from the center of East Los Angeles, adjacent to the Malburg Generating Station (MGS).

The project site is located on relatively flat terrain, at an elevation of approximately 188 feet above sea level.

8.1.1.2 Climate and Meteorology

The semi-permanent high-pressure zone of the eastern Pacific dominates the climate of Southern California including City of Vernon, where the Vernon Power Plant (VPP) project site will be located. Seasonally, the high-pressure zone oscillates in a north-south direction. During the summer, the high-pressure zone moves northward over the Southwest U.S., including southern California, resulting in increased subsidence and clear skies inland, while the coastal sections of southern California experience increased coastal stratus and fog caused by the relatively cool ocean surface temperatures. Frequent inversions caused by subsidence of air that warms when it is compressed over relatively cool, moist marine air occur during the summer.

In winter, the high-pressure zone moves south of southern California, which allows storms originating in the Gulf of Alaska and the mid-latitudes of the Pacific to impact southern California, bringing rain and wind. The majority of the annual precipitation falls between the months of November and April.

The climate of the South Coast Air Basin, including City of Vernon, is influenced primarily by terrain and geographical location. The relative close proximity to the ocean tends to moderate air temperatures, especially near the coast. For example, summer temperatures at the Los Angeles Civic Center, located approximately 5 miles north of City of Vernon, average about 72 degrees Fahrenheit (°F) while cities at relatively short distance to the north and east record average summer temperatures well above 90°F. Winter temperatures at the Los Angeles Civic Center average about 58°F (NOAA, 1974).

A majority of the rainfall in the Vernon area falls during winter and spring as frontal storms move from the northwest to southeast. Over 90 percent of the annual rainfall of about 15 inches (measured at the Los Angeles Civic Center) occurs between November and April (NOAA, 1974). Monsoon moisture and remnants from Eastern Pacific hurricanes occasionally produce showers in the Los Angeles Basin during the summer. Rainfall amounts usually tend to be light and isolated during these events.

Wind speed and wind direction patterns in the Los Angeles Basin are dominated by diurnal daytime onshore flow and nighttime offshore flow (Keith, 1980). Synoptically, frontal storms and Santa Ana flow episodes frequently tend to break the diurnal onshore/offshore wind pattern cycle during the period of September through March. Overall, the basin experiences light, average wind speeds with little seasonal variation.

The South Coast Air Quality Management District (SCAQMD) prepared a modeling data set for 1981 for the City of Vernon meteorological monitoring station. This data set was evaluated for typical winds at the VPP project site. Figures 8.1-1a to 8.1-1i (figures can be found at the end of this subsection) show the annual, and the morning and evening, quarterly wind rose plots for the Vernon meteorological monitoring station. As indicated by the plot in Figure 8.1-1f, nearly 60 percent of all average summer daytime winds come from the west with average speeds over 2.75 miles per hour. As indicated in Figure 8.1-1g, nearly 50 percent of average summer nighttime winds come from the west through northwest. Figure 8.1-1b shows that nearly 40 percent of all average winter daytime winds come from the west through southwest with average speeds over 2.5 miles per hour. Fifty percent of all average winter nighttime winds come from the north through northeast and east as shown in Figure 8.1-1c.

8.1.2 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (USEPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. Areas with air pollution levels above these standards can be considered "nonattainment areas" subject to planning and pollution control requirements that are more stringent than standard requirements.

In addition, the California Air Resources Board (CARB) has established standards for ozone, CO, NO_2, SO_2, sulfates, PM_{10}, $PM_{2.5}$, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (1 hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants, there is more than one air quality standard, reflecting both short-term and long-term effects. Table 8.1-1 presents the NAAQS and California ambient air quality standards for selected pollutants. The California standards are generally set at concentrations much lower than the federal standards and in some cases have shorter averaging periods.

TABLE 8.1-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California	National
Ozone	1 hour	0.09 ppm	0.12 ppm[a]
	8 hours	0.07 ppm	0.08 ppm (3-year average of 4th-highest daily maximum 8-hour concentrations)
CO	8 hours	9.0 ppm	9 ppm
	1 hour	20 ppm	35 ppm
NO_2	Annual arithmetic mean	-	0.053 ppm
	1 hour	0.25 ppm	-
SO_2	Annual arithmetic mean	-	0.03 ppm
	24 hours	0.04 ppm	0.14 ppm
	3 hours	-	0.5 ppm[b] (secondary standard)
	1 hour	0.25 ppm	-

TABLE 8.1-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California	National
PM_{10}	24 hours	50 µg/m3	150 µg/m^3
	Annual arithmetic mean	20 µg/m3	50 µg/m^3 (3-year average of the weighted annual mean concentration)
$PM_{2.5}$	Annual arithmetic mean	12 µg/m3	15 µg/m^3 (3-year average of the weighted annual mean concentrations)
	24 hours	-	65 µg/m^3 (3-year average of 98th percentile of 24-hour concentrations)
Sulfates	24 hours	25 µg/m^3	-
Lead	30 days	1.5 µg/m^3	-
	Calendar quarter	-	1.5 µg/m^3
Hydrogen sulfide	1-hour	0.03 ppm	-
Vinyl chloride	24-hour	0.010 ppm	-
Visibility-reducing particles	8-hour (10am to 6pm PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.	-

[a] The federal 1-hour ozone standard is no longer used.
[b] This is a national secondary standard, which is designed to protect public welfare.
ppm = parts per million
µg/m^3 = micrograms per cubic meter

USEPA's NAAQS for ozone and fine particulate matter went into effect on September 16, 1997. For ozone, the previous 1-hour standard of 0.12 parts per million (ppm) was replaced by an 8-hour average standard at a level of 0.08 ppm. Compliance with this standard will be based on the 3-year average of the annual 4th-highest daily maximum 8-hour average concentration measured at each monitor within an area.

The NAAQS for particulates were revised in several respects. First, compliance with the current 24-hour PM_{10} standard is now based on the 99th percentile of 24-hour concentrations at each monitor within an area. Two new $PM_{2.5}$ standards were added: a standard of 15 micrograms per cubic meter (µg/m^3), based on the 3-year average of annual arithmetic means from single or multiple monitors (as available); and a standard of 65 µg/m^3, based on the 3-year average of the 98th percentile of 24-hour average concentrations at each monitor within an area.

8.1.3 Existing Air Quality

All ambient air quality data are taken from data published by SCAQMD, CARB (ADAM website), and the USEPA (AIRS website). The three CARB-certified monitoring stations located closest to the project site are: the South Central Los Angeles County 1 monitoring station located at 11220 Long Beach Boulevard in the city of Lynnwood (Lynnwood); the Central Los Angeles County monitoring station located at 1630 North Main Street in the city of Los Angeles (North Main Street); and the West San Gabriel Valley monitoring station located at 752 South Wilson Avenue in the city of Pasadena (Pasadena). Ambient concentrations of ozone, NO_2, CO, PM_{10} and fine particulates ($PM_{2.5}$) are recorded at the North Main Street and Lynwood monitoring stations. Ambient concentrations of SO_2 are recorded only at the North Main Street station.

The Central Los Angeles County monitoring station is approximately 4.8 miles north of the project site. The South Central Los Angeles County 1 monitoring station is approximately 4.6 miles south of the project site. The West San Gabriel Valley monitoring station is approximately 10.8 miles northeast of the project site. The locations of the monitoring stations relative to the proposed project are such that emissions measurements recorded at South Central Los Angeles County and Central Los Angeles County monitoring stations are believed to represent area-wide ambient conditions rather than the localized impacts of any particular facility. Due to its proximity, the data from the South Central Los Angeles County 1 monitoring station in Lynnwood are felt to best represent the background ambient air quality for the project. Consequently, data from this monitoring station have been used to estimate background concentrations.

8.1.3.1 Ozone

Ozone is an end product of complex reactions between volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) in the presence of intense ultraviolet radiation. VOC and NO_x emissions from millions of vehicles and stationary sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, and intense sunlight result in high ozone concentrations. For purpose of state and federal air quality planning, the South Coast Air Basin is designated as a nonattainment area for ozone. Tables 8.1-2A and 8.1-2B show the annual maximum hourly ozone levels recorded at North Main Street and Lynwood monitoring stations during the period 2003 to 2005, as well as the number of days in which the state and federal standards were exceeded.

Data from the North Main Street Station show that over the last 3 years ozone concentrations have been consistently above the state standards and was above the state standard and one violation of the federal standard in 2003. The Lynwood Station shows no violations of the federal standard and only one violation of the state standard.

TABLE 8.1-2A
Ozone Levels at North Main Street Station, Los Angeles, 2003-2005 (ppm)

	2003	2004	2005
Highest 1-Hour Average	0.152	0.110	0.121
Number of Days Exceeding			
State Standard (0.09 ppm, 1-hour)	11	7	2
Federal Standard (0.12 ppm, 1-hour)	1	0	0

Sources: 2003-2004 Data from SCAQMD, 2005 data from CARB websites.

TABLE 8.1-2B
Ozone Levels at Lynwood Station, 2003-2005 (ppm)

	2003	2004	2005
Highest 1-Hour Average	0.081	0.084	0.111
Number of Days Exceeding			
State Standard (0.09 ppm, 1-hour)	0	0	1
Federal Standard (0.12 ppm, 1-hour)	0	0	0

Sources: 2003-2004 Data from SCAQMD, 2005 data from CARB websites.

8.1.3.2 Nitrogen Dioxide

Atmospheric NO_2 is formed primarily from reactions between nitric oxide (NO) and oxygen or ozone. NO is formed during high temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes, under certain conditions. For purposes of state and federal air quality planning, the South Coast Air Basin is in attainment for NO_2.

Tables 8.1-3A and 8.1-3B show the maximum 1-hour and annual average NO_2 levels recorded at the North Main Street and Lynwood stations between 2003 and 2005. During the period shown, there has not been a single violation of either the state 1-hour standard or the NAAQS (0.053 ppm, annual average) at either station. These levels remain at approximately half the state standard of 0.25 ppm and the data show a slight downward trend in the annual average concentration.

TABLE 8.1-3A
Nitrogen Dioxide Levels at North Main Street Station, Los Angeles, 2003-2005 (ppm)

	2003	2004	2005
Highest 1-Hour Average	0.16	0.16	0.11
Annual Average (NAAQS = 0.053 ppm)	0.0338	0.0328	0.025
Number of Days Exceeding			
State Standard (0.25 ppm, 1-hour)	0	0	0

Sources: SCAQMD and CARB websites; USEPA AIRS website.

TABLE 8.1-3B
Nitrogen Dioxide Levels at Lynwood Station, 2003-2005 (ppm)

	2003	2004	2005
Highest 1-Hour Average	0.13	0.10	0.089
Annual Average (NAAQS = 0.053 ppm)	0.0312	0.0301	0.029
Number of Days Exceeding			
State Standard (0.25 ppm, 1-hour)	0	0	0

Sources: SCAQMD and CARB websites; USEPA AIRS website.

8.1.3.3 Carbon Monoxide

CO is a product of incomplete combustion, principally from automobiles and other mobile sources of pollution. In many areas of California, CO emissions from wood-burning stoves and fireplaces can also be measurable contributors to high ambient levels of CO. Industrial sources typically contribute less than 10 percent of ambient CO levels. Peak CO levels occur typically during winter months, due to a combination of higher emission rates and stagnant weather conditions. The basin is in attainment for the state CO standards. As there have been no recorded violations of the CO NAAQS over the required three year duration, in March 2005 the SCAQMD requested to have USEPA redesignate the Basin as CO Attainment. Tables 8.1-4A and 8.1-4B show the California and federal air quality standards for CO, and the maximum 1- and 8-hour average levels recorded at North Main Street station and Lynwood station during the period 2002-2005. Trends of maximum 8-hour and 1-hour average CO levels show that maximum ambient CO levels near the project site have been below the state standards for the last 3 years and eight-hour monitoring results at the Lynwood Station, the ambient CO concentrations continue to gradually decline.

TABLE 8.1-4A
Carbon Monoxide Levels at North Main Street Station, Los Angeles, 2003-2005 (ppm)

	2003	2004	2005
Highest 8-hour average	4.6	3.2	2.64
Highest 1-hour average	6	4	3.2
Number of Days Exceeding			
State Standard (9 ppm, 8-hr)	0	0	0
State Standard (20 ppm, 1-hr)	0	0	0
Federal Standard (9.5 ppm, 8-hr)	0	0	0
Federal Standard (35 ppm, 1-hr)	0	0	0

Source: SCAQMD, California Air Quality Data, CARB website; USEPA AIRS website.

TABLE 8.1-4B
Carbon Monoxide Levels at Lynwood Station, 2003-2005 (ppm)

	2003	2004	2005
Highest 8-hour average	7.3	6.7	5.87
Highest 1-hour average	12	10	7.2
Number of Days Exceeding			
State Standard (9 ppm, 8-hr)	0	0	0
State Standard (20 ppm, 1-hr)	0	0	0
Federal Standard (9 ppm, 8-hr)	0	0	0
Federal Standard (35 ppm, 1-hr)	0	0	0

Source: SCAQMD, California Air Quality Data, CARB website; USEPA AIRS website

8.1.3.4 Sulfur Dioxide

Sulfur dioxide is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains negligible sulfur, while fuel oils contain much larger amounts. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The South Coast Air Basin is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Table 8.1-5 presents the maximum SO_2 levels recorded at North Main Street Station in Los Angeles. The federal annual average standard is 0.03 ppm. During the period shown, the annual average SO_2 levels at the North Main Street Station have been well under the federal standards. The state 24-hour average standard is 0.04 ppm, which has not been exceeded at this location. In the past 10 years, maximum 1-hour SO_2 levels have typically been about 1-tenth of the state standard.

TABLE 8.1-5
Sulfur Dioxide Levels at North Main Street, Los Angeles 2003-2005 (ppm)

	2003	2004	2005
Highest 1-hour average	0.05	0.08	0.034
Highest 3-hour average	0.011	0.018	0.016
Highest 24-hour average	0.006	0.015	0.010
Annual Average, All Hours	0.002	0.002	0.002
Number of Days Exceeding			
State Standard (0.25 ppm, 1-hr)	0	0	0
State Standard (0.04 ppm, 24-hour)	0	0	0
Federal Standard (0.5ppm, 3-hour)	0	0	0
Federal Standard (0.14ppm, 24-hours)	0	0	0

Sources: SCAQMD and CARB websites; USEPA AIRS website.

8.1.3.5 Particulate Sulfates

Particulate sulfates are the product of further oxidation of SO_2. The South Coast Air Basin is in attainment of the state standard for sulfates. There is no federal standard for sulfates.

Tables 8.1-6A and 6B show the maximum 24-hour average sulfate levels recorded in North Main Street and Lynwood stations from 2002, 2003, and 2004. The 2005 data should be released shortly and will be provided when released by the SCAQMD. The trend of maximum 24-hour average sulfates over this period show that the maximum levels generally declined to about 50 percent of the state standard.

TABLE 8.1-6A
Particulate Sulfate Levels at North Main Street Station, 2002-2005 (µg/m^3)

	2002	2003	2004	2005
Maximum 24-hour average	15.2	14.6	12.7	*
Number of Days Exceeding				
State Standard (25 µg/m^3, 24-hour)	0	0	0	*

Source: SCAQMD Historical Air Quality Data by Year: http://www.aqmd.gov/smog/historicaldata.htm
* Insufficient data to determine value.

TABLE 8.1-6B
Particulate Sulfate Levels at Lynwood Station, 2002-2005 (µg/m^3)

	2002	2003	2004	2005
Maximum 24-hour average	15.3	14.9	14.7	*
Number of Days Exceeding				
State Standard (25 µg/m^3, 24-hour)	0	0	0	*

Source: SCAQMD Historical Air Quality Data by Year: http://www.aqmd.gov/smog/historicaldata.htm
* Insufficient data to determine value.

8.1.3.6 Fine Particulates (PM_{10} and $PM_{2.5}$)

Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. In 1984, CARB adopted standards for fine particulates (PM_{10}), and phased out the total suspended particulate (TSP) standards that had previously been in effect. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of inhalable particulates related to human health. In 1987, USEPA also replaced national TSP standards with PM_{10} standards. For air quality planning purposes, the South Coast Air Basin is considered to be in nonattainment of both federal and state PM_{10} standards.

Table 8.1-7 shows the maximum 24-hour and annual concentration of PM_{10} recorded at monitoring stations at North Main Street, Los Angeles during 2002 to 2005. The maximum 24-hour PM_{10} levels continue to exceed the state standard several times per year, but the federal 24-hour standard has not been exceeded over the past 10 years.

TABLE 8.1-7
PM_{10} Levels at North Main Street Station, Los Angeles, 2002-2005 (µg/m³)

	2002	2003	2004	2005
Highest 24-hour average	65	81	72	70
Annual Arithmetic Mean (Federal Standard = 50 µg/m³)	39.3	34.6	32.7	27.0
Number of Days Exceeding[b]				
State Standard (50 µg/m³, 24-hour)	8	6	5	[d]
Federal Standard (150 µg/m³, 24-hour)	0	0	0	0
Maximum Expected Violation Days[b,c]				
State Standard (50 µg/m³, 24-hour)	[d]	36.3	30.4	[d]
Federal Standard (150 µg/m³, 24-hour)	[d]	0.0	0.0	[d]

Source: California Air Quality Data, Annual Summary, CARB.
[a] Source: SCAQMD Historical Air Quality Data by Year: http://www.aqmd.gov/smog/historicaldata.htm
[b] Based on readings every six days.
[c] Based on multiplying exceedance readings by a factor of six due to readings taken only once per six days. The actual number of violation days is expected to be less since some of the days readings not taken will be within the standards.
[d] Insufficient data to determine value.

The trend of maximum 24-hour average PM_{10} levels is slightly declining, with the second highest recorded values declining dramatically. Also presented are the maximum expected days where violations of the state and federal standards based on monitoring. It should be noted that since PM_{10} concentrations are only measured once every 6 days, the maximum expected violation days are 6 times the number of measured violations.

$PM_{2.5}$ data are available from the North Main Street, Los Angeles and Lynwood monitoring stations for 2002 to 2005. Tables 8.1-8A and 8.1-8B present the highest 24-hour average concentration and annual arithmetic mean reported by CARB, and the 3-year average levels of those readings (on which compliance with USEPA's proposed ambient standards will be based). The data from the both stations indicate that annual 24-hour average $PM_{2.5}$ concentration levels have been declining and appear to be well under the proposed standard of 65 µg/m³. The 3-year average of annual arithmetic means declined during the period, but remains about 20 percent higher than the proposed NAAQS for this pollutant (15 µg/m³).

TABLE 8.1-8A
$PM_{2.5}$ Levels at North Main Street Station, Los Angeles, 2002-2005 (g/m³)

	2002	2003	2004	2005
Highest 24-Hour Average	66.3	83.7	75.0	73.7
Number of Days Exceeding the National Standard	1	5	2	2
Annual 24-Hour Average Concentration	*	61.3	66.3	54.4
Annual Arithmetic Mean	21.8	21.3	19.6	17.8
Three-Year Average of Annual Arithmetic Mean (Federal Standard = 15 µg/m³)	22	22	21	19

Source: California Air Quality Data, CARB website.
The $PM_{2.5}$ data are derived from the dichotomous sampler and not from a Federal Reference Method $PM_{2.5}$ sampler. CARB indicates that this information should not be used for a regulatory comparison to the national $PM_{2.5}$ standards.
* Insufficient data to determine value.

TABLE 8.1-8B
$PM_{2.5}$ Levels at Lynwood Station, 2003-2005 (g/m^3)

	2002	2003	2004	2005
Highest 24-hour average	64.0	54.8	55.8	54.6
Number of Days Exceeding the National Standard	0	0	0	0
Annual 24-hour average concentration	52.5	52.4	53.0	48.4
3-Year Average—98th Percentile of 24-Hour Average Concentrations (Federal Standard = 65µg/m^3)	60	57	53	51
Annual Arithmetic Mean	23.3	20.2	18.5	17.5
3-Year Average of Annual Arithmetic Mean (Federal Standard = 15µg/m^3)	23	22	20	*

Source: California Air Quality Data, CARB website.
The $PM_{2.5}$ data are derived from the dichotomous sampler and not from a Federal Reference Method $PM_{2.5}$ sampler. CARB indicates that this information should not be used for a regulatory comparison to the national $PM_{2.5}$ standards.
* Insufficient data to determine.

8.1.3.7 Airborne Lead

The majority of lead in the air results from the combustion of fuels that contain lead. Until 30 years ago, motor gasoline contained lead-based compounds used as octane-rating improvers and anti-knock additives, with the result that ambient lead levels were relatively high. Beginning with the 1975 model year, however, manufacturers began to equip new automobiles with exhaust catalysts, which are poisoned by the exhaust products of leaded gasoline. Thus, unleaded gasoline became the required fuel for an increasing fraction of new vehicles, and the phaseout of leaded gasoline began. As a result, ambient lead levels decreased dramatically, and for several years California air basins, including the South Coast Air Basin, have been in attainment of state and federal airborne lead standards for air quality planning purposes. Table 8.1-9A and 9B lists the airborne lead levels recorded at the North Main Street and Lynwood Stations between 2003 and 2005.

TABLE 8.1-9A
Airborne Lead Levels at North Main Street Station, Los Angeles, 2003-2005 (µg/m^3)

	2002	2003	2004	2005
Highest Monthly Average	0.05	0.15	0.03	*
Highest Quarterly Average	0.03	0.15	0.03	0.02

Source: SCAQMD Historical Air Quality Data by Year: http://www.aqmd.gov/smog/historicaldata.htm; USEPA AIRS website.
* Insufficient data to determine.

TABLE 8.1-9B
Airborne Lead Levels at Lynwood Station, Los Angeles, 2003-2005 (µg/m^3)

	2002	2003	2004	2005
Highest Monthly Average	0.04	0.04	0.03	*
Highest Quarterly Average	0.04	0.04	0.03	0.02

Source: SCAQMD Historical Air Quality Data by Year: http://www.aqmd.gov/smog/historicaldata.htm; USEPA AIRS website.
* Insufficient data to determine.

8.1.4 Laws, Ordinances, Regulations, and Standards

The USEPA has responsibility for enforcing, on a national basis, the requirements of many of the country's environmental and hazardous waste laws. California is under the jurisdiction of USEPA Region IX, which has its offices in San Francisco. Region IX is responsible for the local administration of USEPA programs for California, Arizona, Nevada, Hawaii, and certain Pacific trust territories. USEPA's activities relative to the California air pollution control program focus principally on reviewing California's submittals for the State Implementation Plan (SIP). The SIP is required by the federal Clean Air Act to demonstrate how all areas of the state will meet the national ambient air quality standards within the federally-specified deadlines (42 USC §7409, 7411).

CARB was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update as necessary the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards (California Health & Safety Code (H&SC) §39500 et seq.).

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCDs) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California (H&SC §40200 et seq.). While created as a special district through the Lewis-Presley Act in the mid-1970s, the SCAQMD traces its history to one of its predecessor agencies, the Los Angeles Air Pollution Control District, which was formed in 1947.

Air pollution control districts and air quality management districts in California have principal responsibility for:

- Developing plans for meeting the state and federal ambient air quality standard
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution
- Enforcing air pollution statutes and regulations governing non-vehicular sources, and for developing employer-based trip reduction programs

Each level of government has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to this project. The other agencies having permitting authority for this project are shown in Table 8.1-10. The applicable federal laws, ordinances, regulations and standards (LORS) and compliance with these requirements are discussed in more detail in the following subsections. Applications for a Determination of Compliance and a Prevention of Significant Deterioration Permit will be filed with the SCAQMD and the USEPA, respectively, at approximately the same time as the Application for Certification (AFC) is filed with the Commission.

TABLE 8.1-10
Air Quality Agencies

Agency	Authority	Contact
USEPA Region IX	PSD permit issuance, enforcement	Gerardo Rios USEPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 947-3974
CARB	Regulatory oversight	Michael Tollstrup Project Assessment Branch California Air Resources Board 2020 L Street Sacramento, CA 95814 (916) 322-6026
SCAQMD	Permit issuance, enforcement	John Yee South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 917635 (909) 396-2531

8.1.4.1 Federal

The USEPA implements and enforces the requirements of many of the federal environmental laws. USEPA Region IX, which has its offices in San Francisco, administers federal air programs in California. The federal Clean Air Act, as most recently amended in 1990, provides USEPA with the legal authority to regulate air pollution from stationary sources such as the VPP facility. USEPA has promulgated the following stationary source regulatory programs to implement the requirements of the 1990 Clean Air Act:

- Standards of Performance for New Stationary Sources (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAPS)
- Prevention of Significant Deterioration (PSD)
- New Source Review (NSR)
- Title IV: Acid Deposition Control
- Title V: Operating Permits

8.4.1.1.1 National Standards of Performance for New Stationary Sources

Authority: Clean Air Act §111, 42 USC §7411; 40 CFR Part 60, Subparts Db and GG

Purpose: Establishes standards of performance to limit the emission of criteria pollutants (air pollutants for which USEPA has established national ambient air quality standards (NAAQS)) from new or modified facilities in specific source categories. The applicability of these regulations depends on the equipment size; process rate; and/or the date of construction, modification, or reconstruction of the affected facility. The Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (Subpart Db), which limit SO_2, NO_x, and particulate emissions from steam generating units with a capacity of 100 MMBtu/hr or greater, and Standards of Performance for Stationary Gas Turbines (Subpart GG), which limit NO_x and SO_2 emissions from turbines, are applicable to the project. These standards are implemented at the local level with federal and state oversight.

Administering Agency: SCAQMD, with USEPA Region IX and CARB oversight.

8.4.1.1.2 National Emission Standards for Hazardous Air Pollutants

Authority: Clean Air Act § 112, 42 USC §7412; 40 CFR Part 63

Purpose: Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by USEPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories. Requires the use of maximum achievable control technology (MACT) for major sources of HAPs that are not specifically regulated or exempted under Part 63. Standards are implemented at the local level with federal oversight.

40 CFR 63 Subpart YYYY establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emissions from stationary combustion turbines located at major sources of HAP emissions, and requirements to demonstrate initial and continuous compliance with the emission and operating limitations. Facilities subject to Subpart YYYY are required to be in compliance with the emission limits of formaldehyde, as well as the operational limits such as the catalyst inlet temperature.

40 CFR 63 Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

40 CFR 63 Subpart DDDDD establishes national emission limits and work practice standards for hazardous air pollutants (HAP) emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limits and work practice standards.

Because the facility is not a major source of HAP emissions, these standards do not apply and the NESHAP requirements will not be addressed further.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.1.3 Prevention of Significant Deterioration Program

Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

Purpose: Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. Prevention of Significant Deterioration (PSD) applies to pollutants for which ambient concentrations do not exceed the corresponding NAAQS (i.e., attainment pollutants). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas). SCAQMD has relinquished the PSD program and, therefore, the administering agency for the PSD program is USEPA.

Currently, NO_X will be the pollutant subject to PSD review for VPP. However, as an application has been made by the SCAQMD to have the South Coast Air Basin redesignated as attainment for CO, CO emissions may also be subject to PSD review during PSD review by USEPA.

Administering Agency: USEPA Region IX

8.1.4.1.4 New Source Review

Authority: Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52

Purpose: Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient quality standards. This program is implemented at the local level with USEPA oversight.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.1.5 Title IV—Acid Rain Program

Authority: Clean Air Act §401, 42 USC §7651 et seq.; 40 CFR Part 72

Purpose: Requires the reduction of emissions of acidic compounds and their precursors. The principal source of these compounds is the combustion of fossil fuels. Therefore, Title IV established national standards to limit SO_2 and NO_x emissions from electrical power generating facilities. These standards are implemented at the local level with federal oversight.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.1.6 Title V—Operating Permits Program

Authority: Clean Air Act § 501 (Title V), 42 USC §7661; 40 CFR Part 70

Purpose: Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by USEPA as requiring a Title V permit. These requirements are implemented at the local level through SCAQMD Regulation XXX with federal oversight. The Title V permit is tied to the SCAQMD New Source Review regulations. A parallel application will be made to the SCAQMD in addition to the CEC AFC application.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.1.7 CAM Rule

Authority: Clean Air Act § 501 (Title V), 42 USC Section 7414; 40 CFR Part 64

Purpose: Requires facilities to monitor the operation and maintenance of emissions control systems and report any control system malfunctions to the appropriate regulatory agency. If an emission control system is not working properly, the Compliance Assurance Monitoring (CAM) rule also requires a facility take action to correct the control system malfunction. The CAM rule applies to emissions units with uncontrolled potential to emit levels greater than applicable major source thresholds. Emission control systems governed by Title V operating permits requiring continuous compliance determination methods are generally compliant with the CAM rule. Exemptions from CAM are presented in 40 CFR 64.2(b). Since VPP will participate in the SCAQMD's REgional CLean Air Incentives Market (RECLAIM) Cap and Trade program, which has been submitted and approved as part of the SIP, VPP would qualify for the CAM exemption for NO_x emission sources provided in 40 CFR 64.2(b)(1)(iv). Thus, it is further believed that this exemption also exempts VPP from a requirement to prepare and submit a CAM plan for NO_x emissions from fired equipment.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.1.9 Toxic Chemical Release Inventory Program

Authority: Emergency Planning and Community Right-to-Know Act Section 313

Purpose: Under the Emergency Planning and Community Right-to-Know Act (EPCRA), certain facilities and establishments must report toxic releases to the environment if they:

- Manufacture more than 25,000 pounds of a listed chemical per year
- Process more than 25,000 pounds of a listed chemical per year
- Otherwise use more than 10,000 pounds of a listed chemical per year

This program is commonly referred to as the Toxic Chemical Release Inventory (TRI). As applied to electric utilities, only those facilities in Standards Industrial Classification (SIC) Codes 4911, 4931, and 4939 that combust coal and/or oil for the purpose of generating electricity for distribution in commerce must report under this regulation. The VPP facility falls under SIC Code 4911, which covers establishments engaged in the generation, transmission, and/or distribution of electric energy for sale. However, the VPP facility will not combust coal and/or oil for the purpose of generating electricity for the distribution in commerce. Accordingly, this program does not apply to the VPP. Therefore, the TRI program will not be addressed further.

Administering Agency: USEPA Region IX.

8.1.4.2 State

The California Air Resources Board (CARB) was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the State Implementation Plan (SIP) for achievement of the federal ambient air quality standards.

8.1.4.2.1 State Implementation Plan

Authority: Health & Safety Code (H&SC) §39500 et seq.

Purpose: Required by the federal Clean Air Act, the SIP must demonstrate the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules (and/or revise existing rules) and demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in the attainment of NAAQS. The relevant SCAQMD Rules and Regulations that have also been incorporated into the SIP are discussed with the local LORS.

Administering Agency: SCAQMD, with CARB and USEPA Region IX oversight.

8.1.4.2.2 California Clean Air Act

Authority: H&SC §40910 - 40930

Purpose: Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained. The SCAQMD Air Quality Plan is discussed with the local LORS.

Administering Agency: SCAQMD, with CARB oversight.

8.1.4.2.3 Toxic Air Contaminant Program

Authority: H&SC §39650 - 39675

Purpose: Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants (TACs) and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. CARB assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to identify the 187 federal hazardous air pollutants as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions.

Administrating Agency: SCAQMD, with CARB oversight.

8.1.4.2.4 Air Toxic "Hot Spots" Act

Authority: CA Health & Safety Code § 44300-44384; 17 CCR §93300-93347

Purpose: Established in 1987, the Air Toxics "Hot Spots" Information and Assessment Act supplements the toxic air contaminant program, by requiring the development of a statewide inventory of air toxics emissions from stationary sources. The program requires affected facilities to prepare: (1) an emissions inventory plan that identifies relevant air toxics and sources of air toxics emissions; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement risk management plans to reduce the associated health risks. This program is implemented at the local level with state oversight.

Administering Agency: SCAQMD, with CARB oversight.

8.1.4.2.5 CEC and CARB Memorandum of Understanding

Authority: CA Pub. Res. Code § 25523(a); 20 CCR §1752, 1752.5, 2300-2309, and Div. 2, Chap. 5, Art. 1, Appendix B, Part (k)

Purpose: Establishes requirements in the CEC's decision-making process for an AFC that assures protection of environmental quality.

Administering Agency: California Energy Commission.

8.1.4.2.6 Public Nuisance
Authority: H&SC §41700

Purpose: Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or which endanger the comfort, repose, health, or safety of the public, or that damage business or property.

Administrating Agency: SCAQMD, with CARB oversight.

8.1.4.3 Local

When the state's air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California, including the SCAQMD. AQMDs have principal responsibility for developing plans for meeting the NAAQS and California ambient air quality standards; for developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards; for implementing permit programs established for the construction, modification, and operation of sources of air pollution; for enforcing air pollution statutes and regulations governing non-vehicular sources; and for developing employer-based trip reduction programs.

8.1.4.3.1 South Coast Air Quality Management District Air Quality Plans
Authority: H&SC §409144

Purpose: The SCAQMD plans define the proposed strategies, including stationary source control measures and new source review rules, whose implementation will attain the state AAQS. The air quality plans also demonstrate a five percent annual reduction in emissions of nonattainment pollutants in the SCAQMD. The relevant stationary source control measures and new source review requirements are discussed with SCAQMD Rules and Regulation.

Administering Agency: SCAQMD, with USEPA Region IX and CARB oversight.

8.1.4.3.2 SCAQMD Rule 201—Permit to Construct

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose: Rule 201 (Permit to Construct) establishes an orderly procedure for the review of new and modified sources of air pollution through the issuance of permits. Rule 201 specifies that any facility installing nonexempt equipment that causes or controls the emission of air pollutants must first obtain a Permit to Construct from the SCAQMD.

Administering Agency: SCAQMD, with USEPA Region IX and CARB oversight.

8.1.4.3.3 SCAQMD Preconstruction Review for Criteria Pollutants

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose: SCAQMD has three separate preconstruction review programs for new or modified sources of criteria pollutant emissions:

- Regulation XIII (New Source Review) combines the federal and state NSR requirements into a single rule. Regulation XIII establishes pre-construction requirements for new or modified facilities to ensure that operation of such facilities does not interfere with progress towards the attainment of AAQS without unnecessary restricting economic growth. For RECLAIM facilities, this rule applies only to those nonattainment pollutants, or their precursors, not regulated under the RECLAIM program. Since the VPP will be a NO_x RECLAIM facility, new source review provisions for NO_x are addressed under Rule 2005, and not under Regulation XIII.

- Regulation XVII (Prevention of Significant Deterioration) implements the PSD requirements of the federal Clean Air Act for attainment pollutants (i.e., NO_2 and SO_2). Regulation XVII establishes pre-construction review requirements for new or modified facilities to ensure that operation of such facilities does not significantly deteriorate air quality in attainment areas while maintaining a margin for future growth. The PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing major stationary source. SCAQMD classifies an unlisted source (which is not in the specified 28 source categories) that emits or has the potential to emit 250 tons per year (tpy) of any pollutant regulated by the Act as a major stationary source. For listed sources the threshold is 100 tons/per year. NO_x or SO_x emissions, from a modified major source, are subject to PSD if the cumulative emission increases for either pollutant exceeds 40 tpy. In addition a modification at a non-major source is subject to PSD if the modification itself would be considered a major source. SCAQMD has relinquished the PSD program and Regulation XVII no longer applies. The administering agency for the PSD program is USEPA.

- Rule 2005 (New Source Review for RECLAIM) integrates the new source review requirements of the federal and California Clean Air Acts with the SCAQMD's RECLAIM program. Rule 2005 establishes pre-construction requirements for new or modified RECLAIM facilities to ensure that operation of such facilities does not interfere with progress towards the attainment of AAQS without unnecessarily restricting economic growth. RECLAIM is a "Cap and Trade" market incentive program designed to allow facilities flexibility in achieving emission reduction requirements for NO_x and SO_x using methods that include add-on emission controls, equipment modifications, reformulated products, operational changes, shutdowns, and the purchase of excess emission reductions. Since the VPP will be a NO_x RECLAIM facility, it will be subject to the NO_x new source review requirements of Rule 2005. The proposed equipment will not be subject to the SO_x new source review requirements of Rule 2005 because the RECLAIM program does not include SO_x emissions from natural gas combustion equipment for applicability purposes.

A facility can be subject to more than one of these preconstruction review programs depending on the type of criteria pollutants, and criteria pollutant precursors, they will emit. The relevant criteria pollutants and precursors are summarized in Table 8.1-11. A new or modified facility can be subject to the elements of all three programs.

TABLE 8.1-11
Criteria Pollutant Precursors

Criteria Pollutants	Precursors
Ozone	VOC, NO_x
NO_2	NO_x
SO_2	SO_x
Sulfate	SO_x
PM_{10}	VOC, NO_x, SO_x

Preconstruction Air Quality Monitoring

The SCAQMD may, at their discretion, require preconstruction ambient air quality monitoring. Preconstruction monitoring data must be gathered over a 1-year period to characterize local ambient air quality. However, SCAQMD may approve a shorter monitoring period.

Best Available Control Technology (BACT)

BACT must be applied to any new or modified source resulting in an increase in criteria pollutant, ozone depleting compound, and ammonia emissions. The SCAQMD defines BACT as the following unless the limitations are demonstrated to be unachievable:

- Most stringent emission limitation achieved in practice by a control device or technique for that category or class of sources.
- Any control device or technique determined to be technologically feasible and cost-effective.
- Most stringent emission limitation on a comparable emission source contained in any approved SIP (i.e., cannot be less stringent than the emission control required by any applicable federal, state, or SCAQMD laws, rules, or regulations).

Emission Offsets

For a new or modified facility located in SCAQMD Zone 1 (“Coastal Zone”) (as is the VPP), except as exempted in Rule 1304, sufficient emission reduction credits (ERCs) must be provided to offset the increase in CO, PM_{10}, SO_x, and VOC emissions at a 1.2:1 offset ratio. However, if the offsets are being obtained from the SCAQMD’s Priority Reserve, the offset ratio is only 1:1 (Rule 1303). The proposed amendments to Rule 1309.1 increase the Priority Reserve ratio from 1:1 to 1.2:1.

For a new or modified facility located in SCAQMD Zone 1 (as is the VPP), sufficient RECLAIM Trading Credits (RTCs) must be provided to offset the actual anticipated NO_X emissions for the first year of operation at a 1:1 offset ratio (Rule 2005).

Air Quality Impact Analysis

An air quality dispersion analysis must be conducted, using a mass emissions-based analysis contained in the rule or an approved dispersion model, to evaluate impacts of increased criteria pollutant emissions from any new or modified facility on ambient air quality. The VPP project emissions must not cause a significant increase in ambient concentrations of nonattainment pollutants as shown in Subsection 8.1.5.2.4.

Protection of Class I Areas

A modeling analysis must be conducted to assess the impacts of project emissions on plume visibility in nearby Class I areas if the increase from the new or modified source in NO_X and PM_{10} emissions exceed 40 tpy and 15 tpy, respectively and the location of the source, relative to the closest boundary of a specified federal Class I area, is within the specified distance. The minimum distance between the VPP project site and the nearest Class I area (San Gabriel Wilderness Area) is 31 km, which is greater than the maximum distance requirement of 29 kilometers for triggering the visibility analysis. Thus, no visibility analysis is required for the VPP project site. However, the SCAQMD has relinquished its PSD delegated authority to the EPA. Therefore, the Applicant will be submitting a PSD permit directly to the USEPA, which will include a Class I and an Air Quality Related Values analysis (included in Subsection 8.1.5.4).

Administering Agency: SCAQMD, with USEPA Region IX and CARB oversight.

Rule 1316: In December 2002, the United States Environmental Protection Agency (USEPA) adopted amendments to the Clean Air Act modifying NSR requirements for modifications of major sources. Although opposed by the California Air Resources Board (CARB), as well as the AQMD and numerous other local and state agencies, the amendments were mostly upheld upon appeal. Following adoption of the amendment by USEPA, California Senate Bill 288—Protect California Air Act of 2003 (SB 288) sponsored by State Senator Byron Sher was signed into law by the Governor on September 22, 2003. The bill prohibits local districts, including the AQMD, from amending or revising their NSR rules or regulations to be less stringent that those rules and regulations that existed on December 30, 2002. Rule 1316 addresses these two differing state and federal requirements applicable to modifications of major federal sources. USEPA has imposed a deadline of January 1, 2006 for NSR rules to be amended to comply with their requirements. Rule 1316 also provides provisions for the operator of a major stationary source to apply to the SCAQMD Executive Officer for approval of a Plantwide Applicability Limit (PAL) if the operator demonstrates the PAL conforms with all applicable provisions. The SCAQMD Governing Board adopted the amendment to Rule 1316 on December 2, 2005. The main provisions of this rule affect modifications to sources.

Administering Agency: SCAQMD, with CARB oversight.

8.1.4.3.4 SCAQMD Rule 212—Standards for Approving Permits

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Rule 212 requires projects subjected to this rule to distribute the public notice to each address within a quarter-mile radius of the project. Additionally, if a K-12 school is located within the notice zone, then a copy of the notice must be distributed to the parents of each child attending that school. A project is required to notify the public if it will:

- Emit air contaminants within 1,000 feet from the outer boundary of a school; or
- Have onsite emission increases exceeding any of the daily maximums as specified in Rule 212 subdivision (g); or
- Increases in emissions of toxic air contaminants to which a person may be exposed to an individual cancer risk greater than, or equal to, 1 in 1 million as specified in Rule 1401.

Administering Agency: SCAQMD.

8.1.4.3.5 SCAQMD Rule 1401—New Source Review of Toxic Air Contaminants

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Rule 1401 (New Source Review of Toxic Air Contaminants) establishes allowable health risks for new or modified sources of TAC emissions. Rule 1401 specifies permit unit limits for maximum individual cancer risk (MICR), cancer burden, and noncarcinogenic acute and chronic hazard indices (HIs) for new or modified sources of TAC emissions. While Rule 1401 does not specifically require the application of best available control technology for toxics (T-BACT) to any new or modified source emitting carcinogenic TACs, the rule allows a higher MICR risk threshold when T-BACT is applied. The health risks resulting from project emissions, as demonstrated with a risk assessment, must not exceed the following risk thresholds:

- MICR and Cancer Burden
  - An increased MICR greater than 1 in 1 million at any receptor location if the permit unit is constructed without T-BACT
  - An increased MICR greater than 10 in 1 million at any receptor location if the permit unit is constructed with T-BACT
  - A Cancer Burden greater than 0.5
- Chronic Hazard Index (HI)
  - Cumulative HI increase for any target organ system will not exceed 1.0 at any receptor location.
- Acute Hazard Index (HI)
  - Acute HI for any target organ system will not exceed 1.0 at any receptor location.

Administering Agency: SCAQMD.

8.1.4.3.6 SCAQMD Rule 1401.1—Requirements for New and Relocated Facilities Near Schools

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Rule 1401.1 specifies limits for maximum individual cancer risk (MICR), cancer burden, and noncarcinogenic acute and chronic hazard indices (HIs) for new or modified sources of TAC emissions that are within 1,000 feet of a school. As there are no schools within 1,000 feet of the site, this rule is not applicable to the proposed project.

Administering Agency: SCAQMD.

8.1.4.3.7 SCAQMD Regulation XXX—Federal Operating Permit

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Regulation XXX (Title V Permits) provides for the issuance of federal operating permits that contain all federally enforceable requirements for stationary sources as mandated by Title V of the Clean Air Act. Regulation XXX requires major facilities and acid rain facilities undergoing modifications to obtain an operating permit containing the federally enforceable requirements mandated by Title V of the Clean Air Act. A facility shall not construct, modify, or operate equipment at a Title V facility without first

obtaining a permit revision that allows such construction, modification, or operation. An application must be submitted to the SCAQMD that presents all information necessary to evaluate the subject facility and determine the applicability of all regulatory requirements.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.3.8 SCAQMD Regulation XXXI—Acid Rain Permit

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Regulation XXXI (Acid Rain Permit Program) provides for the issuance of acid rain permits in accordance with Title IV of the Clean Air Act. Regulation XXXI requires a subject facility to hold emissions allowances for SO_x, and to monitor SO_x, NO_x, and CO_2 emissions and exhaust gas flow rates (monitoring of operating parameters such as fuel use and fuel consumption is an allowable alternative to exhaust continuous emission monitoring (CEM) systems). An acid rain facility, such as VPP, must also obtain an acid rain permit as mandated by Title IV of the Clean Air Act. A permit application must be submitted to the SCAQMD at least 24 months before operation of the new units commence. The application must present all relevant sources at the facility, a compliance plan for each unit, applicable standards, and estimated commencement date of operation. The necessary Title IV applications will be included with the Title V/RECLAIM/NSR permit application submitted to the SCAQMD.

Administering Agency: SCAQMD, with USEPA Region IX oversight.

8.1.4.3.9 SCAQMD Regulation IX—Standards of Performance for New Stationary Sources

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Regulation IX (Standards of Performance for New Stationary Sources) incorporates, by reference, the provisions of Part 60, Chapter 1, Title 40 of the Code of Federal Regulations. Regulation IX requires compliance with federal Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units and Stationary Gas Turbines.

Subpart Db (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) applies to steam generating units that have a maximum design heat input capacity of 100 million Btu per hour or greater. Although this regulation does not impose emission limitations or monitoring requirements to natural gas fired boilers (including heat recovery steam generators), this subpart does contain notification requirements for such facilities.

Subpart GG (Standards of Performance for Stationary Gas Turbines) applies to gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (Gj/hr), or 10 MMBtu/hr, at the lower heating value. The NSPS limits the sulfur content of fuel to 0.8 percent. For gas turbines larger than 107.2 (Gj/hr) or 100 MMBtu/hr, the NSPS also limits NO_x emissions as determined by the following equation:

$$STD = [0.0075 (14.4) + F]/Y$$

where:

STD = allowable NO_x emissions (percent by volume at 15 percent O_2 on a dry basis)

Y = manufacturer's rated heat rate at peak load (kilojoules per watt hour)

F = NO_x emission allowance for fuel-bound nitrogen (assumed to be zero for natural gas)

Administering Agency: SCAQMD, with CARB and USEPA Region IX oversight.

8.1.4.3.10 SCAQMD Prohibitory Rules

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Relevant prohibitory rules of the SCAQMD applicable to the project include the following:

- **Rule 401—Visible Emissions:** Establishes limits for visible emissions from stationary sources. Rule 401 prohibits visible emissions as dark as or darker than Ringlemann No. 1 for periods greater than 3 minutes in any hour.
- **Rule 402—Nuisance:** Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property.
- **Rule 403—Fugitive Dust:** Establishes requirements to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources. Rule 403 requires the implementation of best available control measures to minimize fugitive dust emissions and prohibits visible dust emissions beyond the property line, a 50 $\mu g/m^3$ incremental increase in PM_{10} concentrations across a facility as measured by upwind and downwind concentrations), and track-out of bulk material onto public, paved roadways.
- **Rule 404—Particulate Matter—Concentration:** Establishes limits for particulate matter emission concentrations. This rule does not apply to emissions resulting from the combustion of liquid or gaseous fuels in steam generators or gas turbines.
- **Rule 405—Particulate Matter—Weight:** Establishes limits for particulate matter mass emission rates. Emission rate limits are based upon the process weight (i.e. fuel burned) per hour.
- **Rule 407—Liquid and Gaseous Air Contaminants:** Establishes limits for CO and SO_x emissions from stationary sources. Rule 407 prohibits CO and SO_x emissions in excess of 2,000 ppm and 500 ppm, respectively, from any source. In addition, equipment that complies with the requirements of Rule 431.1 is exempt from the SO_x limit. Since the facility will comply with Rule 431.1, the SO_x provisions of Rule 407 will not be addressed further.
- **Rule 409—Combustion Contaminants:** Establishes limits for particulate emissions from fuel combustion sources. Rule 409 prohibits particulate emissions in excess of 0.1 grains per cubic foot of gas at 12 percent CO_2 at standard conditions.
- **Rule 431.1—Sulfur Content of Gaseous Fuels:** Establishes limits for the sulfur content of gaseous fuels to reduce SO_x emissions from stationary combustion sources. Rule 431.1 limits the sulfur content of natural gas calculated as H_2S to be less than 16 ppmv.
- **Rule 431.2—Sulfur Content of Liquid Fuels:** Establishes limits for the sulfur content of liquid fuels to reduce SO_x emissions from stationary combustion sources. Rule 431.2 limits the sulfur content of diesel fuel, purchased after June 1, 2004, to 15 ppm by weight.

- **Rule 474—Fuel Burning Equipment—Oxides of Nitrogen:** Establishes limits for emissions of NO_x from stationary combustion sources. However, NO_x RECLAIM facilities are exempt from the provisions of Rule 474. Since the VPP will be a NO_x RECLAIM facility, Rule 474 is not applicable and will not be addressed further.
- **Rule 475—Electric Power Generating Equipment:** Establishes limits for combustion contaminant (i.e. PM) emissions from subject equipment. Rule 475 prohibits PM emissions that exceed both 11 lbs/hr (per emission unit) and 0.01 grains per dry standard cubic foot (gr/dscf) at 3 percent O_2. These provisions do not apply to replacement equipment if such equipment reduces NO_x emissions by at least 50 percent provided that PM emissions do not exceed 0.05 gr/dscf.
- **Rule 476—Steam Generating Equipment:** Establishes limits for NO_x and PM emissions from steam generating equipment with a maximum heat input rating exceeding 50 MMBtu/hr. However, NO_x RECLAIM facilities are exempt from the NO_x requirements for this rule. Therefore, only the PM provisions of this rule will apply.
- **Rule 53A—Specific Contaminants:** Established limits for emissions of sulfur compounds (i.e., SO_x) and combustion contaminants (i.e., PM) from stationary sources. Rule 53A prohibits SO_2 and PM emissions of 500 ppm and 0.1 gr/dscf at 12 percent CO_2, respectively.

Administering Agency: SCAQMD, with CARB and USEPA Region IX oversight.

8.1.4.3.11 SCAQMD Source Specific Standards

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Relevant source-specific standards of the SCAQMD applicable to the project include the following:

- **Rule 1110.2—Emissions from Stationary Internal Combustion Engines:** Establishes limits for emission of NO_x, VOC, and CO from the stationary internal combustion reciprocating engines. Emergency standby engines that operate less than 200 hours per year are exempt from this regulation (Rule 1110.2(h)(2). Additionally, RECLAIM exempts IC engines from the NO_x provisions in this rule.
- **Rule 1134—Emissions of Oxides of Nitrogen from Stationary Gas Turbines:** Establishes limits for emissions of NO_x from the stationary gas turbines. However, NO_x RECLAIM facilities are exempt from the provisions of Rule 1134. Therefore, Rule 1134 is not applicable to the VPP and will not be addressed further.
- **Rule 1135—Emissions of Oxides of Nitrogen from Electric Power Generating Systems:** Establishes limits for emissions of NO_x from the electricity generating systems. However, NO_x RECLAIM facilities are exempt from the provisions of Rule 1135. Therefore, Rule 1135 is not applicable to the VPP and will not be addressed further.
- **Rule 1146—Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters:** Establishes limits for emissions of NO_x and CO from industrial, institutional, and commercial steam generating units. However, NO_x RECLAIM facilities are exempt from the NO_x requirements for this rule. Therefore, only the CO provisions of this rule would apply. However, this rule is not applicable to VPP as the auxiliary boiler, used during turbine start ups, will be electrically heated and the definition of boilers and steam generators in

the definition section of the rule (Rule 1146(a)(3) and the applicability in Rule 1146(b)(1) specifically exclude combustion equipment used exclusively to produce electricity from steam and waste heat boilers located downstream of gas turbines. This rule will not be addressed further.

Administering Agency: SCAQMD, with CARB and USEPA Region IX oversight.

8.1.4.3.12 SCAQMD Toxics and Other Non-Criteria Pollutant Standards

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Relevant toxics and other non-criteria pollutant standards of the SCAQMD applicable to the project include the following:

- **Rule 1404—Hexavalent Chromium Emissions from Cooling Towers:** Prohibits the addition of hexavalent chromium-containing water treatment chemicals to cooling tower circulating water.
- **Rule 1470—Requirements for Stationary Diesel Fueled Internal Combustion and Other Compression Ignition Engines:** Establishes fuel and emissions requirements of diesel engines. As of January 1, 2006, all engines need to use CARB Diesel Fuel or an alternative diesel fuel that meets the requirements of the Verification Procedure. The rule sets forth the PM emission limits of 0.15 gram per horsepower hour (g/hp-hr) for new standby engines, and limits the operation time of non-emergency use of the engine.

Administering Agency: SCAQMD, with CARB oversight.

8.1.4.3.13 Proposed SCAQMD Rules

Authority: H&SC §40000 et seq., H&SC §40400 et seq.

Purpose and Requirements: Proposed rules of the SCAQMD applicable to the project include the following:

- **Proposed Rule 1309.1—Priority Reserve:** If approved, the provisions that authorized electric generating facilities (EGFs) access to the Priority Reserve that expired on December 31, 2003 would be re-established with a revised sunset date of December 31, 2008. This amendment would allow, as previously done, EGFs access to the AQMD Priority Reserve account for the purpose of obtaining offsets, after having first established that the required offsets are not reasonably available in the open market, paying a mitigation fee and adhering to certain other requirements of the rule. This rule is being proposed due to the shortage of emission reduction credits (ERCs), specifically SO_X, CO, and PM_{10} in the open market. A public hearing is scheduled for July 2006 on the proposed amendments.

All applicable LORS are summarized in Table 8.1-12.

TABLE 8.1-12
Laws, Ordinances, Regulations, Standards (LORS), and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
Federal					
Clean Air Act §111, 42 USC §7411; 40 CFR Part 60, Subparts Db and GG, National Standards of Performance for New Stationary Sources	Establishes standards of performance to limit the emission of criteria pollutants (air pollutants for which USEPA has established national ambient air quality standards [NAAQS]) from new or modified facilities in specific source categories.	SCAQMD, with USEPA Region IX oversight	After project review, issues determination of compliance (DOC) with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.1, 8.1.4.1.3
Clean Air Act § 112, 42 USC §7412; 40 CFR Part 63 National Emission Standards for Hazardous Air Pollutants	Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by USEPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories.	SCAQMD, with USEPA Region IX oversight	Not applicable	Not applicable	8.1.4.1.1
Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42 USC §7470-7491), Title 40 Code of Federal Regulations (CFR) Parts 51 & 52 (Prevention of Significant Deterioration Program)	Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to pollutants for which the area is in attainment with the NAAQS.	EPA Region IX	Issues Prevention of Significant Deterioration Permit for New Source.	Permit application will be submitted by the end of February 2006. Permit to be obtained before start of construction.	8.1.4.1.1, 8.1.4.1.3
Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52, New Source Review	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than NAAQS.	SCAQMD, with USEPA Region IX oversight	After project review, issues DOC with conditions limiting emissions.	Permit application has been submitted. Agency approval to be obtained before start of construction.	8.1.4.1.1, 8.1.4.1.3

TABLE 8.1-12
Laws, Ordinances, Regulations, Standards (LORS), and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
CAA §401 (Title IV), 42 USC §7651 (Acid Rain Program), 40 CRF part 70	Requires reductions in NO_x and SO_2 emissions.	Permit application will be submitted 24 months prior to operation. SCAQMD, with USEPA Region IX oversight	Issues Acid Rain monitoring plan error report after review of application.	Meet compliance deadlines listed in regulations; no permit issued.	8.1.4.1.1
CAA §501 (Title V), 42 USC §7661,7414, 40 CFR Part 64 (CAM Rule)	Establishes on-site monitoring requirements for emission control systems.	SCAQMD, with USEPA Region IX oversight	Monitoring conditions included in RECLAIM/Title V permit.	Permit application has been submitted. Title V Permit to be obtained prior to commencement of construction	8.1.4.1.1, 8.1.4.1.3
EPCRA Section 313	Requires toxic chemical release inventory to be prepared annually.	SCAQMD, with USEPA Region IX oversight	Not applicable	Not applicable	8.1.4.1.1
State					
H&SC §44300-44384; California Code of Regulations (CCR) §93300-93347 (Toxic "Hot Spots" Act)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	SCAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	HRA submitted as part of AFC.	8.1.4.1.2, 8.6
California Public Resources Code §25523(a); 20 CCR §§1752.5, 2300-2309, and Division 2, Chapter 5, Article 1, Appendix B, Part (k) (CEC & CARB Memorandum of Understanding)	Requires that CEC's decision on AFC include requirements to assure protection of environmental quality; AFC required to address air quality protection, including mitigation.	CEC	After project review, issues Final DOC with conditions limiting emissions.	SCAQMD issues a DOC to the CEC prior to CEC licensing.	8.1.4.1.2
Local					
SCAQMD Air Quality Plan & H&SC §41914	Defines proposed strategies including stationary source control measures and new source review rules.	SCAQMD, with CARB oversight	Addressed in SCAQMD Rules and Regulations.	Not Applicable	Not applicable

TABLE 8.1-12
Laws, Ordinances, Regulations, Standards (LORS), and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
SCAQMD Rule 201, H&S §40000 et seq., H&S §40400 et seq. (Permit to Construct)	Establishes an orderly procedure for the review of new and modified sources of air pollution through the issuance of permits	SCAQMD, with CARB and USEPA Region IX oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Regulation XIII (Rule 1303), Rule 2005, H&SC §40000 et seq., §40400 et seq. (New Source Review)	Combines federal and state NSR requirements. Establishes pre-construction requirements for new or modified facilities. Rule 2005 applies to RECLAIM facilities.	SCAQMD, with CARB and USEPA Region IX oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Regulation XVII, H&SC §39500 et seq. (Prevention of Significant Deterioration Program)	Requires PSD review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to pollutants for which ambient concentrations are lower than NAAQS.	EPA Region IX	SCAQMD has relinquished the PSD program and Regulation XVII no longer applies. The administering agency for the PSD program is USEPA.	See Federal	8.1.4.1.1, 8.1.4.1.3
SCAQMD Rule 212, H&SC §40000 et seq., §40400 et seq. (Standards for Approving Permits)	Requires facility to distribute public notice if the source is within 1,000 ft from school, or emissions or risks exceeding applicable thresholds	SCAQMD, with CARB and USEPA Region IX oversight	Agency to prepare and publish notice prior to permit issuance.	Public notice to be published 30 days prior to permit issuance.	8.1.4.1.3
SCAQMD Rule 1401, H&SC §40000 et seq., §40400 et seq. (New Source Review of Toxic Contaminants)	Establishes allowable health risks for new or modified sources.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
Proposed SCAQMD Rule 1401.1, H&SC §40000 et seq., §40400 et seq. (Requirements for New and Relocated Sources Near Schools)	Establishes allowable health risks for new or modified sources near schools	SCAQMD, with CARB oversight	Not applicable	Not applicable	8.1.4.1.3
SCAQMD Regulation XXX, H&SC §40000 et seq., §40400 et seq. (Title V Permits)	Provides for the issuance of federal operating permits mandated by Title V of the Clean Air Act.	SCAQMD, with USEPA Region IX oversight	Agency to issue Title V Permit.	Agency approval to be obtained before start of construction.	8.1.4.1.1, 8.1.4.1.3
SCAQMD Rule 401, H&SC §40000 et seq., §40400 et seq. (Visible Emissions)	Establishes limits for visible emissions from stationary sources	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3

TABLE 8.1-12
Laws, Ordinances, Regulations, Standards (LORS), and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
SCAQMD Rule 402, H&SC §40000 et seq., §40400 et seq. (Nuisance)	Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 403, H&SC §40000 et seq., §40400 et seq. (Fugitive Dust)	Establishes requirements to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 404, H&SC §40000 et seq., §40400 et seq. (Particulate Matter—Concentration)	Establishes limits for particulate matter emission concentrations.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 405, H&SC §40000 et seq., §40400 et seq. (Particulate Matter—Weight)	Establishes limits for particulate matter mass emission rates.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 407, H&SC §40000 et seq., §40400 et seq. (Liquid and Gaseous Air Contaminants)	Limits CO and SO_x emissions from stationary sources.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 409, H&SC §40000 et seq., §40400 et seq. (Combustion contaminants)	Establishes limits for particulate emissions from fuel combustion sources	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 431.1, H&SC §40000 et seq., §40400 et seq. (Sulfur Content of Gaseous Fuels)	Establishes limits for the sulfur content of gaseous fuels to reduce SO_x emissions from stationary combustion sources.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 431.2, H&SC §40000 et seq., §40400 et seq. (Sulfur Content of Liquid Fuels)	Limits the sulfur content of diesel fuel to reduce SO_x emissions from stationary combustion sources.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 474, H&SC §40000 et seq., §40400 et seq. (Fuel Burning Equipment—Oxides of Nitrogen)	Limits NO_x emissions from stationary sources.	SCAQMD, with CARB oversight	Not applicable because the facility is subject to RECLAIM.	Not applicable	8.1.4.1.3

TABLE 8.1-12
Laws, Ordinances, Regulations, Standards (LORS), and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Sections)
SCAQMD Rule 475, H&SC §40000 et seq., §40400 et seq. (Electric Power Generating Equipment)	Establishes limits for combustion contaminant (i.e. PM) emissions from subject equipment.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 476, H&SC §40000 et seq., §40400 et seq. (Steam Generating Equipment)	Limits NO_x and combustion contaminants from stationary combustion sources.	SCAQMD, with CARB	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 1110.2, H&SC §40000 et seq., §40400 et seq. (Emissions form Stationary Internal Combustion Engines)	Limits emissions of NO_x, VOC, and CO form stationary internal combustion engines. Engines are exempt from this rule if each is operated less than 200 hour per year.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 1134, H&SC §40000 et seq., §40400 et seq. (Emissions of Oxides of Nitrogen from Stationary Gas Turbines)	Limits NO_x from stationary gas turbines.	SCAQMD, with CARB oversight	Not applicable because the facility is subject to RECLAIM.	Not applicable	8.1.4.1.3
SCAQMD Rule 1135, H&SC §40000 et seq., §40400 et seq. (Emissions of Oxides of Nitrogen from Electric Power Generating Systems)	Limits NO_x from electric power generating systems.	SCAQMD, with CARB oversight	Not applicable because the facility is subject to RECLAIM.	Not applicable	8.1.4.1.3
SCAQMD Rule 1146, H&SC §40000 et seq., §40400 et seq. (Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)	Limits NO_x and CO from industrial, institutional, and commercial steam generating units. Project exempted from NO_x requirements of this rule through participation in the NO_x RECLAIM program.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 1404, H&SC §40000 et seq., §40400 et seq. (Hexavalent Chromium Emissions from Cooling Towers)	Prohibits the use of hexavalent chromium containing water treatment chemicals	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3
SCAQMD Rule 1470, H&SC §40000 et seq., §40400 et seq. (Requirements for Stationary Diesel Fueled Internal Combustion and Other Compression Ignition engine)	Establishes fuel and emissions requirements of diesel engines. Limits non-emergency operating hours for standby engines.	SCAQMD, with CARB oversight	After project review, issues Final DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	8.1.4.1.3

8.1.5 Environmental Consequences

8.1.5.1 Overview of the Analytical Approach to Estimating Facility Impacts

Emissions sources at VPP include two gas turbines with heat recovery steam generators (HRSG) and supplemental burners (duct burners), and a 10-cell cooling tower, plus minor auxiliary equipment, including an emergency fire pump engine, and an oil/water separator to process stormwater runoff. The normal operating range of the turbines will be between 60 percent and 100 percent of their maximum rated output. Supplemental firing will be provided by the duct burners as needed to maintain required electricity production rates. Evaporative inlet air cooling will be used to increase power output under certain ambient conditions as well. An electric auxiliary boiler will be used to provide steam to shorten the duration required to start up the plant. Emission control systems will be fully operational during all operations except startups and shutdowns. Maximum annual emissions are based on operation of the project at maximum firing rates and include the expected maximum number of startup periods that may occur in a year. During turbine startup, emission rates will be higher until steady-state operation for the gas turbine and emission control systems is achieved.

Ambient air quality impact analyses for the VPP have been conducted to satisfy the USEPA, SCAQMD, and CEC requirements during the operational phase for criteria pollutants (NO_2, CO, PM_{10}, $PM_{2.5}$, and SO_2), noncriteria pollutants, and construction phase impacts on a pollutant-specific basis. The following subsections describe the emission sources that have been evaluated, the ambient impact analyses results, and the evaluation of facility compliance with the applicable air quality regulations, including SCAQMD Rule 2005 (NO_x RECLAIM New Source Review), Rule XIII (New Source Review), and the PSD requirements per USEPA Region IX.

8.1.5.1.1 Facility Emissions

As discussed in Section 2, the VPP project will consist of two Siemens SGT6-5000F (formally Siemens-Westinghouse 501FD) combustion turbines, rated at 198 MW (nominal at site design conditions); two heat recovery steam generators (HRSGs) equipped with duct burners rated at 170 MMBtu/hr (HHV, each); a 245-MW (nominal) condensing steam turbine; one electric auxiliary boiler; a 10-cell cooling tower with a 120,773 gallon per minute recirculation rate. Incidental equipment will include a 210 horsepower (hp) emergency diesel fire pump, an oil/water separator, and an aqueous ammonia storage tank. Performance specifications are provided in Appendix 8.1A for the turbines. Natural gas will be the only fuel consumed during plant operation. There will be no distillate fuel oil firing at VPP except in the emergency fire pump engine. Typical specifications for the natural gas fuel are shown in Table 8.1-13.

Natural gas combustion results in the formation of NO_x, SO_2, unburned hydrocarbons (VOC), PM_{10}, and CO. Because natural gas is a clean burning fuel, there will be minimal formation of combustion PM_{10} and SO_2. The combustion turbines will be equipped with ultra low NOx combustors that minimize the formation of NO_x and CO. To further reduce NO_x emissions, selective catalytic reduction (SCR) and oxidation catalyst control systems will be used.

TABLE 8.1-13
Typical Natural Gas Specifications

Component Analysis		Chemical Analysis	
Component	**Average Concentration, Volume**	**Constituent**	**Percent by Weight**
CH_4	96.19 %	C	72.71%
C_2H_6	1.57%	H	23.77%
C_3H_8	0.23%	N	0.78%
C_4H_{10}	0.07%	O	2.74%
C_5H_{12}	0.01%	S	0.25 gr/100 scf
C6H14	0.02%		
N_2	0.47 %		
CO_2	1.44 %	Higher Heating Value	1,014 Btu/scf 223,726 Btu/lb
S	< 0.001%		

Reference: Malburg Generating Station Application for Certification.

Various other pollutants will also be emitted by the facility, including ammonia, which will be used as a reactant by the SCR systems to control NO_x. Emissions of all of the criteria and noncriteria pollutants have been characterized and quantified in this application.

Criteria Pollutant Emissions

Commissioning Phase

Initial operation will occur when VPP undergoes the commissioning period. During this period, the turbines will be operated at various loads with and without the emission control systems fully operational. In order to reduce emissions during commissioning, CO catalyst will be installed prior to the first firing of the turbines. This will reduce CO and VOC emissions during commissioning of the turbines. In addition, the combustors will be tuned early in the commissioning schedule. Emissions during the commissioning period were estimated based on the commissioning schedule and turbine performance provided by the vendor. Hourly emissions were estimated for each commissioning event, based on turbine operation and a ramping rate of 3 megawatts per minute to the commissioning event load. Emissions during the ramping period were estimated using the emissions at an intermediate load.

Table 8.1-14 presents the maximum hourly per turbine emission rates for NO_x, CO, PM_{10}, SO_2, and VOC. An annual evaluation is not done since the commissioning period is expected to occur for only 89 days. During the commissioning phase, VPP will ensure that air pollutant emissions are reduced to the extent feasible. Appendix 8.1A presents the commissioning schedule, turbine performance, and VPP's estimate of emissions during each commissioning event.

TABLE 8.1-14
Facility Commissioning Emission Rates

	NO_x	CO	PM_{10}	SO_2	VOC
Maximum Hourly per Turbine, lb/hour	142	274	11	1.2	122

* Estimated based on vendor data. See Appendix 8.1A, Table 8.1A.1-4.

Operational Phase

The gas turbine and duct burner operational emission rates have been estimated from vendor data, project design criteria, and established emission calculation procedures. Emission estimates and vendor data are provided in Appendix 8.1A.The emission rates for the combustion turbines alone, and the combustion turbines with duct burners alone are shown in Tables 8.1-15.

TABLE 8.1-15
Maximum Pollutant Emission Rates, Each Gas Turbine[a]

Pollutant	ppmvd @ 15% O_2	Each Gas Turbine without Duct Firing (lb/hr)[e]	Each Gas Turbine with Duct Firing (lb/hr)[f]
NO_x	2.0[b,e]	15.4	16.2
CO	2.0[b]	9.4	9.9
VOC	2.0[b]	3.7[g]	5.7
PM_{10}[c]	-	10	12
SO_2[d]	<1.0	1.22	1.3
NH_3[h]	5	14.0	14.4

[a] Maximum values exclude startups and shutdowns.
[b] Project design criteria.
[c] 100 percent of particulate matter emissions assumed to be emitted as PM_{10} and $PM_{2.5}$; $PM_{10}/PM_{2.5}$ emissions include both front and back half as those terms are used in USEPA Method 5.
[d] Assessed using the emission factor of 0.6 lb SO_2/ MMCF natural gas from the SCAQMD's AER program.
[e] Baseload operating case at ambient temperature of 35°F without duct burners operating.
[f] Baseload operating case at ambient temperature of 65°F with duct burners operating.
[g] 60 percent operating case at ambient temperature of 35°F without duct burners operating.
[h] Based on baseload at ambient temperature of 35°F without duct burners operating and baseload at ambient temperature of 65°F with duct burners operating.

The maximum firing rates, daily and annual fuel consumption rates, and operating restrictions define the allowable operations that determine the maximum potential hourly, daily, and annual emissions for each pollutant. These allowable operations are typically referred to as "the operating envelope" for a facility. The maximum heat input rates (fuel consumption rates) for the gas turbines and duct burners during the normal operation are shown in Table 8.1-16.

TABLE 8.1-16
Maximum Facility Fuel Use (MMBtu)

Period	Gas Turbines and Duct Burners (each[a])	Total Fuel Use (all units)
Per Hour	2,119	4,238
Per Day	50,856	101,712
Per Year	18,562,440	37,124,880

[a] Each CTG/HRSG.
[b] Based on 24 hours per day, 7 days per week for the gas turbines and 8,760 hours per year of duct firing, per turbine. Derived from Siemens data for Baseload operation and duct burners at 65°F (annual average temperature at the project site).

Start Up and Shut Down Emissions

The VPP plant systems have been designed using the Siemens SGT6-5000F Gas Turbine, which incorporates a new Fast Start design. This design includes instrumentation and controls that provide a high-level of automation, resulting in a plant that is safe and is easy to operate with a high degree of flexibility throughout its operating range. The Fast Start design incorporates the following features:

- Properly integrated system design and controls to achieve fast plant starts on a consistent basis
- A once-through HRSG (Benson Boiler) design with a 100 percent steam bypass system
- Systems configuration and equipment to facilitate achieving operating chemistry during each start sequence
- An electric auxiliary boiler

The major benefit of the Fast Start design is to reduce plant startup times in comparison to conventional combined cycle plants. The shorter startup times result in reduced air emissions and fuel savings for every start. An electric auxiliary boiler provides steam to the steam turbine and air removal systems enabling the condenser vacuum to be achieved more quickly. This is accomplished using Siemen's highly automated master load controller that operates the plant in a sliding pressure mode in combination with the Benson Boiler and a steam bypass system. This sliding pressure mode allows 100 percent of the steam produced by the HRSGs to bypass the steam turbine and be directed to the condenser. This control mode allows for the gradual heating of the steam turbine by modulating the steam bypass system valves, which directs steam to the steam turbine for heating of the steam turbine consistent with the manufacturer's recommendations. This Fast Start design allows the steam turbine to reach operating temperatures independent of combustion turbine's operating load. This reduces the time the combustion turbines are operated at loads where the emission control system performance is not optimized.

The Fast Start design of the VPP will allow the facility to achieve a plant start up within a 1-hour period. There will be two startup scenarios: (1) hot/warm start and (2) cold start. A hot/warm start up is expected to take approximately 33 minutes from fuel initiation until a base load operating rate is achieved. A cold start up is expected to take approximately 28 minutes from fuel initiation until a 70 percent load rate is achieved. The difference

between these starting scenarios for VPP is that a cold start ramps from zero load to a 70 percent load (combustion turbine generator load) and then stays at this load for an extended duration in order to heat the steam turbine. Whereas the hot/warm start ramps from zero load to base load, and includes some operation at load rates where the emission control systems are operational, but not achieving the proposed BACT levels for NO_X, CO, and VOC emissions. A shutdown is expected to take approximately 31 minutes for the CTG to ramp from base load to zero load. Like with the hot/warm starts, the emission control systems are operational, but not achieving the proposed BACT levels for NO_X, CO, and VOC emissions.

The startup and shutdown emission rates are shown in Table 8.1-17. PM_{10}/$PM_{2.5}$ and SO_2 emissions have not been included in this table because emissions of these pollutants will be lower during a startup or shutdown period than during baseload facility operation. The methodology used to estimate the startup and shutdown emissions are provided in Appendix 8.1A, Table 8.1A.3.

TABLE 8.1-17
Facility Startup/Shutdown Emission Rates per Turbine*

	NO_x	CO	VOC
Cold Startup, lb/start	21.6	185.2	20.5
Hot-Warm Startup, lb/start	28.0	265	32.0
Shutdown, lb/shutdown	22.0	87.0	10.0

* Estimated based on vendor data. See Appendix 8.1A, Table 8.1A.3.

Facility Emissions

Emissions from the cooling tower were calculated from the maximum design cooling water total dissolved solids (TDS) level at 5 cycles of concentration and 8,760 operating hours per year. Emissions from the fire pump are based on 1 half-hour of testing per week and a total of 50 hours of testing per year. In addition, it was assumed that a start up and shut down would occur 365 days per year.

The maximum facility emissions was based on the turbine/HRSG emission rates shown in Table 8.1-15; the startup emission rates shown in Table 8.1-17, and the ambient conditions that result in the highest emission rates. The maximum annual, daily, and hourly emissions for the project during normal operation are shown in Table 8.1-18. Detailed turbine emission calculations are provided in Appendix 8.1A.

TABLE 8.1-18
VPP Facility Emissions

	NO_x	SO_2	VOC	CO	PM_{10}
Maximum Hourly Emissions, lb/hr					
Turbine and Duct Burner[a]	28.0	1.3	32.0	265	12
Fire Pump Engine	0.97	0.001	0.02	0.1	0.02
Cooling Tower	-	-	-	-	1.07

TABLE 8.1-18
VPP Facility Emissions

	NO_x	SO_2	VOC	CO	PM_{10}
Oil Water Separator	-	-	0.001	-	-
Total Project, pounds per hour	**28.97**	**1.3**	**32.0**	**265.1**	**13.1**
Maximum Daily Emissions, lb/day					
Two Turbines and Duct Burners[b]	878	61.8	358	1,179	596
Fire Pump Engine	0.97	0.001	0.02	0.1	0.02
Cooling Tower	-	-	-	-	25.6
Oil Water Separator	-	-	0.024	-	-
Total Project, pounds per day	**879**	**61.8**	**358**	**1157**	**622**
Maximum Annual Emissions, lbs/year					
Two Turbines and Duct Burners[c]	320,324	22,541	130,524	430,408	217,467
Fire Pump Engine	48.3	0.1	1.0	5.2	0.9
Cooling Tower	-	-	-	-	8,550
Oil Water Separator	-	-	9.5	-	-
Total Project, pounds per year	**320,372**	**22,541**	**130,535**	**430,413**	**226,018**
Total Project, ton per year	**160**	**11.3**	**65.3**	**215**	**113**

a Worst case hourly emissions for NOx are from the startup, for CO and VOC are from the shutdown, and for PM10 and SO2 are from the steady state operation. See Appendix 8.1A.

b NOx, VOC, and CO worst case values include one startup and one shutdown and 22 hours of steady state operation. SO2 and PM10 values are from steady state operation. See Appendix 8.1A.

c Annual emissions are based on 365 startups and shutdowns per year and a 8,760 hours of operation per year. See Appendix 8.1A.

Noncriteria Pollutant Emissions

Noncriteria pollutants are compounds that have been identified as pollutants that pose a significant health hazard. Nine of these pollutants are regulated under the federal New Source Review program: lead, asbestos, beryllium, mercury, fluorides, sulfuric acid mist, hydrogen sulfide, total reduced sulfur, and reduced sulfur compounds.[1] In addition to these 9 compounds, the federal Clean Air Act lists 187 substances as potential hazardous air pollutants (Clean Air Act Sec. 112(b)(1)). The SCAQMD has also published a list of compounds it defines as potential toxic air contaminants (Rule 1401). Any pollutant that may be emitted from the project and is on the federal New Source Review list, the federal Clean Air Act list, and/or the SCAQMD Rule 1401 list has been evaluated as part of the AFC. Emission factors were determined by reviewing the available technical data, determining the products of combustion, and/or using material balance calculations.

Noncriteria pollutant emission factors for the analysis of emissions from the gas turbines were obtained from AP-42 (Table 3.1-3, 4/00, and Table 3.4-1 of the Background Document

[1] These pollutants are regulated under federal and state air quality programs; however, they are evaluated as noncriteria pollutants by the California Energy Commission.

for Section 3.1). Although the turbines/HRSGs will be equipped with oxidation catalyst systems, only the acrolein, benzene, and formaldehyde emission factors reflect any control. The MGS noncriteria pollutant emissions are also included in Table 8.1-19 combined and individual HAP emissions in order to demonstrate conformance with the MACT requirements. The MGS HAP emissions were taken from the MGS AFC (Table 8.6-2), with the exception of the formaldehyde emissions. The formaldehyde emissions were calculated using the AP-42 emission factors identified above, assuming the MGS turbines operated at the maximum heat input (520.62 MMBtu/hour) for 8,760 hours per year. As shown in Table 8.1-19, the emissions of each individual HAP are below 10 tons per year and total HAP emissions are below 25 tons per year, the turbines are not subject to the MACT requirements of 40 CFR 63.

The fire pump noncriteria pollutant emission factors were taken from data compiled by the Ventura County APCD in conformance with the SCAQMD's guidance. The maximum hourly and annual cooling tower noncriteria pollutant emissions were calculated from an analysis of cooling tower water supplies. Maximum hourly cooling tower emissions were based on the maximum cooling water design concentrations, and the annual emissions were based on the annual average cooling water design concentrations.

The noncriteria pollutants that may be emitted from the project are shown in Table 8.1-19. Appendix 8.1A provides the detailed emission calculations for noncriteria pollutants with the exception of ammonia, which is calculated from an ammonia slip level of 5 ppm.

TABLE 8.1-19
Noncriteria Pollutant Emissions for the Project

Pollutant	Emission Factor (lb/MMscf)[a]	Emissions	
		lb/hr (each turbine)	ton/yr (total, 2 turbines)
Ammonia[b]	5 ppmvd	14.4	126
HAPs			
Acetaldehyde	4.08E-02	0.085	0.7
Acrolein	3.69E-03	0.00767	0.07
Benzene	3.33E-03	0.0069	0.06
1,3-Butadiene	4.39E-04	0.00091	0.01
Ethylbenzene	3.26E-02	0.0678	0.6
Formaldehyde	3.67E-01	0.763	6.7
Naphthalene	1.33E-03	0.0028	0.02
PAHs	1.40E-05	0.00003	0.0003
Propylene oxide	2.96E-02	0.0615	0.54
Toluene	1.33E-01	0.275	2.4
Xylene	6.53E-02	0.136	1.2
Fire Pump	**Emission Factor[c] (lb/1,000 gallons)**	**lb/hr**	**ton/yr**
Benzene	1.86E-01	0.001	9.50E-05

TABLE 8.1-19
Noncriteria Pollutant Emissions for the Project

Formaldehyde	1.73	0.009	8.80E-04
PAHs—naphthalene	5.59E-02	0.0003	2.85E-05
Naphthalene	1.97E-02	0.0001	1.00E-05
Acetaldehyde	7.83E-01	0.004	3.99E-04
Acrolein	3.39E-02	0.0002	1.73E-05
1,3 Butadiene	2.17E-01	0.001	1.11E-04
Chlorobenzene	2.00E-04	0.000001	1.02E-07
Dioxins	ND	ND	ND
Furans	ND	ND	ND
Propylene	4.67E-01	0.002	2.38E-04
Hexane	2.69E-02	0.0001	1.37E-05
Toluene	1.05E-01	0.001	5.38E-05
Xylenes	4.24E-02	0.0002	2.16E-05
Ethyl benzene	1.09E-02	0.0001	5.56E-06
Hydrogen chloride	1.86E-01	0.001	9.50E-05
Arsenic	1.60E-03	0.00001	8.16E-07
Beryllium	ND	ND	ND
Cadmium	1.50E-03	0.00001	7.65E-07
Total chromium	6.00E-04	0.000003	3.06E-07
Hexavalent chromium	1.00E-04	0.000001	5.10E-08
Copper	4.10E-03	0.00002	2.09E-06
Lead	8.30E-03	0.00004	4.23E-06
Manganese	3.10E-03	0.00002	1.58E-06
Mercury	2.00E-03	0.00001	1.02E-06
Nickel	3.90E-03	0.00002	1.99E-06
Selenium	2.20E-03	0.00001	1.12E-06
Zinc	2.24E-02	0.0001	1.14E-05

	Emissions	
Cooling Tower	**lb/hr**	**ton/yr**
Chlorine	1.51E-03	6.62E-03
Manganese (Mn)	1.06E-04	1.99E-04
Cyanide (total)	1.51E-05	3.97E-05
Arsenic	3.17E-06	7.28E-06

TABLE 8.1-19
Noncriteria Pollutant Emissions for the Project

Cadmium	6.04E-04	1.32E-03
Chromium (as Cr+6)	7.40E-06	2.25E-05
Copper	8.61E-05	3.77E-04
Lead	7.55E-06	9.93E-06
Nickel	1.22E-04	5.36E-04
Mercury	6.04E-05	2.65E-04
Silver	6.19E-04	1.02E-03
Zinc	1.37E-04	3.71E-04
Barium	7.40E-05	2.78E-04
Selenium	1.81E-06	3.97E-06
Antimony	3.17E-06	5.29E-06
Beryllium	7.55E-07	1.99E-06
Maximum VPP Individual HAP (Formaldehyde from the CTGs and Fire Pump)		6.7
Maximum MGS Individual HAP (Formaldehyde from the CTGs)[d]		1.6
Total Project Individual HAP (Formaldehyde from the CTGs and Fire Pump)		8.3
Total VPP HAPs		12.3
Total MGS HAPs[e]		3.6
Total Project HAPs		15.9

Source: Appendix 8.1, Tables 8.1A.7A through D.

[a] Obtained from AP-42 Table 3.1-3 revised April 2000 for natural gas-fired combustion turbines. Formaldehyde, benzene, and acrolein emission factors are from the Background Document for AP-42 Section 3.1, Table 3.4-1 for a natural gas-fired combustion turbine with an oxidation catalyst.

[b] Based on an exhaust ammonia limit of 5 ppmv @ 15% O_2 and an F-factor of 8710.

[c] Emergency fire pump emission factors are from Ventura County APCD AB-2588 Combustion Emission Factors, dated May 17, 2001.

[d] Based on MGS turbine heat input of 520.6 MMBtu/hr per turbine, using the formaldehyde emission factor of 3.67E-01 lb/MMscf for combustion turbines, and 8760 hours per year of operation.

[e] MGS AFC, Table 8.6-2, with the formaldehyde emissions calculated as identified above.

ND = non-detect
ppmvd = dry corrected at 15% O_2

Construction Emissions

To evaluate the emissions expected to occur during the proposed 24 month construction period, the emission sources were divided into two categories: sources within the boundary of the proposed power plant site (i.e., onsite) and activities related to the project which occur outside the boundary (i.e., offsite). Onsite emission sources include the exhaust emissions from off-road construction equipment and motorized vehicles, and fugitive dust emissions from motorized vehicles traveling on unpaved surfaces. Offsite emission sources include the exhaust emissions from construction equipment and motorized vehicles used to install the project related linears (i.e., the natural gas, sewer, recycled water, and transmission lines), as

well as, the exhaust emissions from motor vehicles traveling to and from the proposed VPP work site. Table 8.1-20 presents the total project emissions and the maximum daily emission rate for each pollutant during construction. The methodology used to estimate the construction emissions are provided in Appendix 8.1C.

TABLE 8.1-20
Total Project Construction Emissions

	NO_x	CO	VOC	SO_2	PM_{10}
Total Tons for Project					
Onsite Power Plant Construction (tons)	17.3	20.0	2.7	0.08	4.6
Offsite Motor Vehicles (tons)[a]	2.9	2.0	0.3	0.005	5.1
Offsite Linear Construction (tons)[b]	16.5	21.0	2.7	0.07	2.9
Total (Power Plant plus Offsite Motor Vehicles plus Offsite Linear)	36.7	43.0	5.7	0.15	12.6
Maximum Pounds per Day					
Onsite Power Plant Construction (lbs/day)	114.7	122.5	17.0	0.46	22.4
Offsite Motor Vehicles (lbs/day)	15.3	12.4	1.6	0.03	27.3
Offsite Linear Construction (lbs/day)	196.8	252.6	32.3	0.87	33.7
Maximum Combined (lb/day)[c]	253.1	313.4	40.5	1.09	81.7

[a] Offsite motor vehicles includes vehicle emissions from worker commute trips and truck trips to the laydown areas during power plant construction.
[b] Offsite linear construction represents emissions from the construction of the natural gas, sewer, recycled water, and transmission lines.
[c] The combined emissions represents the month where overlap of power plant construction, offsite motor vehicle trips, and offsite linear construction results in the maximum pounds per day. The maximum emissions occur in month 16, except for PM_{10}, where the maximum occurs in month 15.

8.1.5.2 Air Quality Impact Analysis

8.1.5.2.1 Air Quality Modeling Methodology

An assessment of impacts from the project on ambient air quality has been conducted using USEPA-approved air quality dispersion models. These models are based on various mathematical descriptions of atmospheric diffusion and dispersion processes in which a pollutant source impact can be calculated over a given area.

The impact analysis was used to determine the worst-case ground-level impacts of the proposed project. The results were compared with established state and federal ambient air quality standards and PSD significance levels. If the standards are not exceeded under these worst-case conditions, then it is demonstrated that no exceedances are expected under any conditions. In accordance with the air quality impact analysis guidelines developed by USEPA (40 CFR Part 51, Appendix W: *Guideline on Air Quality Models*), the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain, and
- Aerodynamic effects (downwash) due to nearby building(s) and structures

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. Building downwash can occur when wind speeds are high and a building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee side (downwind) of the building or structure.

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution about the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2(y/\sigma_y)^2}\right) * \left[\left\{e^{-1/2(z-H/\sigma_z)^2}\right\} + \left\{e^{-1/2(z+H/\sigma_z)^2}\right\}\right]$$

where:

C	=	the concentration in the air of the substance or pollutant in question
Q	=	the pollutant emission rate
$\sigma_y\sigma_z$	=	the horizontal and vertical dispersion coefficients, respectively, at downwind distance x
u	=	the wind speed at the height of the plume center
x,y,z	=	the variables that define the 3-dimensional Cartesian coordinate system used; the downwind, crosswind, and vertical distances from the base of the stack
H	=	the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and/or buoyancy of the plume)

Gaussian dispersion models are approved by USEPA for regulatory use and are based on conservative assumptions (i.e., the models tend to over predict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.). The USEPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. The following subsections describe:

- Screening modeling procedures
- Refined air quality impact analysis
- Existing ambient pollutant concentrations and preconstruction monitoring
- Results of the ambient air quality modeling analyses
- PSD increment consumption

The screening and refined air quality impact analyses were performed using the Industrial Source Complex, Short-Term Model ISCST3 (Version 02035). ISCST3 is a Gaussian dispersion model capable of assessing impacts from a variety of source types in areas of simple, intermediate, and complex terrain. The model can account for settling and dry

deposition of particulates; area, line, and volume source types; downwash effects; and gradual plume rise as a function of downwind distance. The model is capable of estimating concentrations for a wide range of averaging times (from 1 hour to 1 year).

Inputs required by the ISCST3 model include the following:

- Model options
- Meteorological data
- Source data
- Receptor data

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Examples of model options include use of site-specific vertical profiles of wind speed and temperature; consideration of stack and building wake effects; and time-dependent exponential decay of pollutants. The model supplies recommended default options for the user. Except where explicitly stated (such as for building downwash, as described in more detail below) default values were used. A number of these default values are required for USEPA and local District approval of model results and are listed below.

- Urban dispersion coefficients
- Final plume rise
- Stack tip downwash
- Buoyancy induced dispersion
- No calm processing (SCAQMD requirement)
- No missing data processing
- Default wind profile exponents
- Default vertical potential temperature gradients
- 10-meter anemometer height

ISCST3 uses hourly meteorological data to characterize plume dispersion. The representativeness of the data is dependent on the proximity of the meteorological monitoring site to the area under consideration; the complexity of the terrain, the exposure of the meteorological monitoring site, and the period of time during which the data are collected. The SCAQMD has established a standard set of meteorological data files for use in air quality modeling in the Basin. For the vicinity of the VPP site, the SCAQMD requires the use of its Vernon 1981 meteorological data file. In the Vernon data set, the surface wind speeds and directions were collected at the SCAQMD's Vernon monitoring station (Station ID 52132), while the upper air sounding data used to estimate hourly mixing heights were gathered at the Los Angeles International Airport (LAX) monitoring station.

The VPP project area is a well developed urban area. An area surrounding a project site can either be characterized as urban or rural for ISCST3 dispersion modeling purposes. However, according to SCAQMD guidance, the urban dispersion mode should be used for all sites within the SCAQMD. Therefore, the urban dispersion mode was used for this air quality impact analysis.

Fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may be drawn to the ground with little diffusion, causing high ground-level pollutant concentrations.

Although fumigation conditions rarely last as long as 1 hour, relatively high ground-level concentrations may be reached during that time.

The SCREEN3 model is typically used to evaluate maximum ground-level concentrations for short-term averaging periods (less than 24-hours). However, SCREEN3 is suitable for fumigation modeling analysis only in rural areas. Since the VPP project site is located in an urban area, SCREEN3 fumigation modeling was not performed.

The required emission source data inputs to ISCST3 include source locations, source elevations, stack heights, stack diameters, stack exit temperatures and velocities, and emission rates. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used is the Universal Transverse Mercator Projection (UTM). In addition, the USEPA's Building Profile Input Program (BPIP) (Dated 04112) requires onsite and offsite building dimension data to calculate the impacts of building downwash and the federal Good Engineering Practice (GEP) stack height. The required ISCST3 input data and detailed building parameters are located in Appendix 8.1B.

Following USEPA modeling guidance, the modeled stack height beyond what is determined GEP is not allowed. However, this requirement does not place a limit on the actual constructed height of a stack. GEP as used in modeling analyses is the maximum height allowed to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP modeling restriction assures that any required regulatory control measure is not compromised by the effect of that portion of the stack that exceeds the GEP.

The USEPA guidance ("Guideline for Determination of Good Engineering Practice Stack Height," Revised 6/85) for determining GEP stack height is as follows:

$$Hg = H + 1.5L$$

where:

Hg	=	GEP stack height, measured from the ground-level elevation at the base of the stack
H	=	height of nearby structure(s) measured from the ground-level elevation at the base of the stack
L	=	lesser dimension, height or projected width, of nearby structure(s)

In using this equation, the guidance document indicates that both the height and width of the structure are determined from the frontal area of the structure, projected onto a plane perpendicular to the direction of the wind.

Based on the onsite and offsite building dimensions as input into BPIP, the calculated GEP height for the facility is 68.6 meters. The proposed turbine stack height of 54.9 meters does not exceed GEP stack height.

Cartesian coordinate receptor grids were used to: assess the ground-level pollution concentrations surrounding the project area, identify the extent of significant impacts, and

identify the maximum impact locations. A fine receptor grid (i.e., 30-meter resolution) was used around the fence line and extended out to 10 kilometers (km). The fine receptor grid was used for both the screening and detailed modeling analysis. Concentrations within the facility fence line were not calculated.

Receptor and source base elevations were determined using the 7.5-minute USGS Digital Elevation Model (DEM) data (i.e., 30-meter spacing between grid nodes). All coordinates were referenced to the UTM North American Datum 1927 (NAD27), zone 11.

8.1.5.2.2 Operational Ambient Air Quality Impact Analysis

The emissions used for modeling the worst-case impacts were based on maximum short-term emissions that assumed the highest pollutant emission rates based on either load, temperature, or whether the turbine was in a start-up or shutdown cycle. For the daily emissions, it was assumed that the turbine would be operating approximately 23 hours under normal operating conditions with an additional 1 hour in startup/shutdown, with the exception of $PM_{10}/PM_{2.5}$ where the daily emissions were higher during duct burner firing for 24 hours. For the annual worst-case impacts, 8,760 hours of normal operating conditions plus 365 startup and shutdown events were assumed. The fire pump was assumed to operate 1 half-hour per day and 50 hours per year for maintenance testing. The cooling tower was assumed to operate 8,760 hours per year at the maximum water recirculation rate.

In evaluating the impacts of the proposed project on ambient air quality, modeling of the worst case ambient impacts for the project were added to highest representative background concentrations, and the results compared to the state and federal ambient air quality standards. For pollutants with ambient background concentrations that exceed the most stringent ambient air quality standards (i.e., 24-hour PM_{10} and $PM_{2.5}$, and annual PM_{10} and $PM_{2.5}$), the modeling results were compared to the significant change thresholds established by SCAQMD in Rule 1303. To ensure the operational impacts were based on maximum emission levels and worst-case dispersion conditions, screening and detailed modeling analyses were conducted.

The screening analysis was used to predict the maximum impact for each of the normal turbine operating conditions and the startup and shutdown cycles. The screening analysis was conducted using a unit emission factor, ISCST3, and the 1981 SCAQMD Vernon meteorological data set. The analysis includes the range of turbine operating conditions including maximum through minimum loads, with and without duct burner, and with and without an evaporative cooler, at three different operating temperatures (93°F, 65°F and 35°F). The VPP facility is expected to operate between 60 and 100 percent load. However, modeling was conducted for load rates between 50 and 100 percent, reflecting a more conservative impact assessment. A summary of the operating conditions examined in this screening analysis, along with their exhaust and emission characteristics are shown in Appendix 8.1B, Table 8.1B.1. Because the fire pump and cooling tower emissions were independent of the turbine conditions and the point of maximum turbine impacts are expected to occur several kilometers from the VPP site, the fire pump and cooling tower were not included as part of the screening analysis. The screening analysis showed that the highest pollutant impacts resulted from two operational modes (100 percent load with duct burner and evaporative cooler at 65ºF, and 50 percent load with no evaporative cooler at 93ºF) and the startup/shutdown cycles (Table 8.1-21).

The detailed modeling analysis was used to predict the final impact from each of the scenarios identified in the screening analysis using the actual turbine emission rates combined with the fire pump and cooling tower emissions. The maximum impacts for NO_2, CO, and SO_2 from the MGS facility were added to the maximum VPP impacts in the ambient air quality analysis. To determine the maximum PM_{10} impacts from both MGS and VPP, the maximum expected VPP PM_{10} emissions and the maximum measured MGS PM_{10} emissions were modeled. The VPP stack parameters and emission rates for these operating conditions are presented in Tables 8.1-21 and 8.1-22. The MGS stack parameters used in the PM_{10} modeling analysis were taken from Appendix H, Table H.3-2 of the MGS AFC. The results of the detailed modeling analysis are presented in Subsection 8.1.5.2.4 and Appendix 8.1B.

TABLE 8.1-21
Detailed Model Input for Normal Turbine Operation

Averaging Period	Scenario	Exit Velocity (m/s)	Exhaust Temp (K)	Emission Rates							
				NO_x		CO		SO_2		PM_{10}	
				lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
Annual (PM_{10}, SO_2, NO_x)	100% load with duct burner at 65°F, evaporative cooler	18.17	264.8	18.9	2.38	-	-	1.33	0.17	12.80	1.61
24-hour (PM_{10}, SO_2)	100% load with duct burner at 65°F, evaporative cooler	18.19	364.8	-	-	-	-	1.26	0.16	12.00	1.51
8-hour (CO)	50% load at 93°F, no evaporative cooler	10.95	362.0	-	-	50.7	6.39	-	-	-	-
3-hour (SO_2)	100% load with duct burner at 65°F, evaporative cooler	18.17	364.8	-	-	-	-	1.26	0.16	-	-
1-hour (NO_2 and CO)	Startup	11.65	364.3	34.9	4.40	269.2	33.9	-	-	-	-
1-hour (SO_2)	100% load with duct burner at 65°F, evaporative cooler	18.17	364.8	-	-	-	-	1.26	0.16	-	-

See Appendix A, Table 8.1A-4G.

TABLE 8.1-22
Fire Pump and Cooling Tower Emissions

	NO_x		CO		SO_2		PM_{10}	
	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)
Fire Pump[a]								
1-hour	9.65E-01	1.22E-01	1.04E-01	1.31E-02	1.08E-03	1.36E-04	1.74E-02	2.19E-03
3-hour	-	-	-	-	3.60E-04	4.53E-05	-	-
8-hour	-	-	1.30E-02	1.64E-03	-	-	-	-

TABLE 8.1-22
Fire Pump and Cooling Tower Emissions

	NO_x		CO		SO_2		PM_{10}	
	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)
24-hour	4.02E-02	5.07E-03	-	-	4.49E-05	5.66E-06	7.23E-04	9.11E-05
Annual	5.51E-03	6.94E-04	-	-	6.16E-06	7.76E-07	9.91E-05	1.25E-05
Cooling Tower[b]								
24-hour	-	-	-	-	-	-	1.07E-01	1.34E-02
Annual	-	-	-	-	-	-	9.76E-02	1.23E-02

[a] Fire Pump will be operated 50 hours per year for maintenance testing at a maximum of half an hour per operation.
[b] Emission rate per cooling tower cell for a total of 10 cells.

Startup/Shutdown Turbine Cycles

The short-term facility impacts from the turbine startup and shutdown cycles were modeled as part of the normal operations analysis. A summary of the stack parameters used in the startup and shutdown modeling analysis are shown in Appendix 8.1B.

Pre-construction Monitoring

To ensure that the project impacts will not cause or contribute to a violation of an ambient air quality standard or an exceedance of a PSD increment, an analysis of the existing air quality in the project area is necessary. Federal regulations require pre-construction ambient air quality monitoring data for the purposes of establishing background pollutant concentrations in the impact area. However, a facility may be exempted from this requirement if the predicted air quality impacts of the facility do not exceed the *de minimis* levels listed in Table 8.1-23.

TABLE 8.1-23
PSD Preconstruction Monitoring Exemption Levels

Pollutant	Averaging Period	De minimis Level
CO	8-hour average	575 $\mu g/m^3$
PM_{10}	24-hour average	10 $\mu g/m^3$
NO_2	annual average	14 $\mu g/m^3$
SO_2	24-hour average	13 $\mu g/m^3$

With USEPA approval, a facility may rely on air quality monitoring data collected at nearby monitoring stations to satisfy the requirement for pre-construction monitoring. In such a case, in accordance with Section 2.4 of the USEPA PSD guideline, the last 3 years of ambient monitoring data may be used if they are representative of the area's air quality where the maximum impacts occur due to the proposed source.

The background data need not be collected onsite, as long as the data are representative of the air quality in the subject area (40 CFR 51, Appendix W, Section 9.2). Three criteria are applied in determining whether the background data are representative: (1) location, (2) data quality, and (3) data currentness. These criteria are defined as follows:

- **Location:** The measured data must be representative of the areas where the maximum concentration occurs for the proposed stationary source, existing sources, and a combination of the proposed and existing sources.
- **Data quality:** Data must be collected and equipment must be operated in accordance with the requirements of 40 CFR Part 58, Appendices A and B, and PSD monitoring guidance.
- **Data Currentness:** The data are current if they have been collected within the preceding 3 years and they are representative of existing conditions.

All of the data used in this analysis meet the requirements of Appendices A and B of 40 CFR Part 58, and thus all meet the criterion for data quality. All of the data have been collected within the preceding 3 years, and thus all meet the criterion for currentness. The locations of the data sets used to represent background concentrations of each pollutant are discussed individually below.

Ambient NO_2, CO, and O_3 data have been collected at the Lynwood monitoring station, which is located approximately 5.6 miles south of the project site. The nearest ambient SO_2 and PM_{10} monitor is located at the North Main street location, which is 6.3 miles north of the project site. Since both monitoring sites are located close to the VPP project, they represent area-wide ambient conditions.

8.1.5.2.3 Turbine Commissioning Ambient Air Quality Impact Analysis

During the commissioning period, the CTGs are operated without the emission control systems fully operational. To control CO emissions during this period, VPP will install the oxidation catalyst system prior to first fire. Based on vendor estimates, this provides a CO control efficiency of 89 percent. The ultra low NO_x combustors will be tuned in the initial stages of the commissioning period and the SCR systems will be installed and tuned near the middle of the commissioning period. After the SCR systems are tuned, NO_x emissions will be at BACT during operations above 50 percent CTG loads (the VPP combustion turbines are expected to operate between 60 and 100 percent load). However, during the commissioning period, emissions of NO_x and CO will be significantly higher than during other operating conditions. Therefore, the Applicant analyzed the ambient air quality impacts during commissioning.

In evaluating the impacts of the proposed project on ambient air quality, modeling of the worst case ambient impacts for the project were added to representative background concentrations, and the results compared to the state and federal ambient air quality standards. For pollutants with ambient background concentrations that exceed the most stringent ambient air quality standards (i.e., 8-hour CO, 24-hour PM_{10} and $PM_{2.5}$, and annual PM_{10} and $PM_{2.5}$), the modeling results were also compared to the significant change thresholds established by SCAQMD in Rule 1303.

The screening analysis was used to predict the maximum impact for each of the commissioning scenarios. The screening analysis was conducted using a unit emission factor, ISCST3, and the 1981 SCAQMD Vernon meteorological data set. A summary of the commissioning scenarios examined in this screening analysis, along with their exhaust and emission characteristics, are shown in Appendix 8.1B. The fire pump and cooling tower emissions were not included as part of the turbine commissioning analysis. The screening

analysis was evaluated to determine the maximum impact from each individual unit and the maximum impact for multiple turbines operating simultaneously.

The results of the screening analysis were used to determine the worst-case operating scenario by pollutant and averaging period for the detailed modeling analysis. The stack parameters and emission rates used to determine the maximum impacts for the individual turbine units are presented in Tables 8.1-24. The results of the detailed individual turbine modeling analysis are presented in Subsection 8.1.5.2.4 and Appendix 8.1B.

TABLE 8.1-24
Detailed Model Input—Commissioning Scenario, Individual Turbine Units

Averaging Period	Scenario	Exit Velocity (m/s)	Exhaust Temp (K)	Emission Rates			
				NO_x	CO	SO_2	PM_{10}
24-hour PM_{10} and SO_2 (lb/hr)	Commissioning duct burners, performance testing with duct burners	18.16	364.8	-	-	1.21	10.8
(g/s)				-	-	0.153	1.36
8-hour CO	CTG testing (full speed no load [FSNL])	9.43	359.3	-	287.8	-	-
(g/s)				-	36.3	-	-
3-hour SO_2	Commissioning duct burners, RATA, pre-performance testing, source testing, drift testing, Cal ISO certification with duct burner, and performance testing with duct burners	9.58	359.3	-	-	1.25	-
(g/s)				-	-	0.157	-
1-hour SO_2	Commissioning duct burners, RATA, pre-performance testing, source testing, drift testing and Cal ISO certification with duct burner, performance testing with duct burner	9.58	359.3			1.25	-
(g/s)				-	-	0.157	-
1-hour NO_2	Extended bypass blowdown to condenser/HRSG tuning	9.49	359.3	142	-	-	-
(g/s)				17.9	-	-	-
1-hour CO	CTG testing (FSNL)	9.43	359.3	-	386	-	-
(g/s)				-	48.6	-	-

The details of the emission rate estimates are presented in Appendix 8.1B

The stack parameters and emission rates used to determine the maximum impacts for the combined turbine units are presented in Tables 8.1-25.

TABLE 8.1-25
Detailed Model Input—Commissioning Scenario, Facility-wide Impacts

Averaging Period	Scenario	Exit Velocity (m/s)	Exhaust Temp (K)	Emission Rates			
				NO_x	CO	SO_2	PM_{10}
24-hour $PM_{10}$and SO_2 (lb/hr)	Commissioning duct burners, performance testing with duct burners	18.16	364.8	-	-	1.21	10.8
(g/s)				-	-	0.153	1.36
8-hour CO	CTG testing (FSNL)	9.43	359.3	-	287.8	-	-
(g/s)				-	36.3	-	-
3-hour SO_2	Commissioning duct burners, RATA, pre-performance testing, source testing, drift testing, Cal ISO certification with duct burner, and performance testing with duct burners	9.58	359.3	-	-	1.25	-
(g/s)				-	-	0.157	-
1-hour NO_x, CO, SO_2	Commissioning duct burners, RATA, pre-performance testing, source testing, drift testing and Cal ISO certification with duct burner, performance testing with duct burner	9.58	359.3	103.7	330.6	1.25	-
(g/s)				13.1	41.7	0.157	-

The details of the emission rate estimates are presented in Appendix 8.1B

8.1.5.2.4 Results of the Ambient Air Quality Modeling Analyses

To determine a project's air quality impacts, the modeled concentrations are added to the maximum background ambient air concentrations and then compared to the applicable ambient air quality standards.

Table 8.1-26 presents the maximum concentrations of NO_x, SO_2, CO, PM_{10}, and $PM_{2.5}$, recorded for the most recent years (2003 through 2005) from the Lynwood and North Main Street stations.

TABLE 8.1-26
Maximum Background Concentrations 2003-2005 (µg/m³)

Pollutant	Averaging Time	2003	2004	2005	Maximum
NO_2	1-hour	245	188	167	245
	annual	58.3	56.4	56.44	58.3
SO_2	1-hour	130.9	209.4	89.00	209.4
	3-hour	28.8	47.1	41.88	47.1
	24-hour	15.7	39.3	26.18	39.3
	annual	5.2	5.2	5.24	5.24
CO	1-hour	13,742	11,452	8245	13742
	8-hour	8,360	7,673	6,722	8,360
PM_{10}	24-hour	81	72	68.0	81
	annual	34.6	32.7	27	34.6

TABLE 8.1-26
Maximum Background Concentrations 2003-2005 (µg/m³)

Pollutant	Averaging Time	2003	2004	2005	Maximum
$PM_{2.5}$	24-hour	54.8	55.8	53.7	55.8
	annual	20.2	18.5	16.0	20.2

[a] Source of data was based on availability. SCAQMD, CARB, and then EPA AIRS website were used to obtain background data.
[b] Annual Arithmetic Mean
www.aqmd.gov/smog/historicaldata.html, www.arb.ca.gov/adam/welcome.html, www.epa.gov/air/data/data/monvals.html

Operational Impacts

The highest modeled concentration for each emission unit will be used for comparison to the ambient air quality standards.

The highest modeled concentration was used in demonstrating compliance with AAQS. Table 8.1-27 presents a comparison of the maximum VPP operational impacts to the most stringent ambient air quality standards, from the National and California Ambient Air Quality Standards. The maximum MGS combustion turbines ambient air quality impacts for NO_2, CO, and SO_2, taken from AIR QUALITY Table 16 of MGS FSA, were included in this analysis. The PM_{10} emissions for the VPP and MGS were modeled to demonstrate compliance with the AAQS. The MGS PM_{10} impacts were modeled based on the exhaust parameters presented in the MGS AFC, and the highest measured PM_{10} emission rate determined from source testing. The maximum NO_2 impacts from the combined VPP and MGS modeling represent the maximum VPP NO_2 impact from the fire pump and the maximum MGS turbine NO_2 impacts. Testing of both fire pumps during the same hour would result in 1-hour NO_2 impacts above the ambient air quality standard. Therefore, the MGS and VPP fire pumps will not be tested within the same 60 minute period.

TABLE 8.1-27
Normal Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Most Stringent Ambient Air Quality Standards, Facility-wide Emissions

	VPP Impact	MGS impact	Background	Total Ground-level Concentration	Most Stringent AAQS
1-hour NO_2	187.8	21.8	244.6	454.2	470
Annual NO_2	0.41	0.39	58.32	59.1	100
1-hour CO	212.9	40.5	13,742	13,996	23,000
8-hour CO	12.43	1.21	8,360	8,374	10,000
1-hour SO_2	0.83	0.33	209	211	655
3-hour SO_2	0.59	NA	47.1	47.7	1,300
24-hour SO_2	0.13	0.06	39.3	39.5	105
Annual SO_2	0.039	0.02	5.2	5.3	80
24-hour PM_{10}	1.41	-	81.0	82.4	50
Annual PM_{10}	0.41	-	34.6	35.0	20
24-hour $PM_{2.5}$	1.41	-	55.8	57.2	65

TABLE 8.1-27
Normal Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Most Stringent Ambient Air Quality Standards, Facility-wide Emissions

	VPP Impact	MGS impact	Background	Total Ground-level Concentration	Most Stringent AAQS
Annual $PM_{2.5}$	0.41	-	20.2	20.6	12

Notes:

- 1st highest modeled concentrations were used.
- Annual NO_2 concentration was obtained by using a factor of 75% to convert NO_x to NO_2, according to the Guideline on Air Quality Models (40 CFR, Part 51, Appendix W, April 15, 2003)
- All exceedance are due to the high background concentrations which already exceeded the ambient air quality standard.
- Background concentrations were the highest concentrations monitored during 2003 - 2005.
- Maximum impacts from MGS operation were from Table AIR QUALITY Table 16 of MGS FSA.
- The annual and 24 hour PM_{10} and $PM_{2.5}$ impacts are presented for VPP only as these pollutants were actually modeled for both VPP and MGS particulate emissions. It is assumed that the PM2.5 impacts are the same as the PM_{10} impacts

For those pollutants and averaging periods where the background concentrations do not exceed the AAQS, the project will not cause or contribute to the violation of a standard. For those pollutants where the background data is in excess of the standards, the project's impact plus background is above the standard, and would contribute to a violation of the standard absence mitigation that will be provided in the form of emission reduction credits.

The results of the commissioning period modeling analysis are presented in Table 8.1-28, which shows that the project will not cause a violation of any AAQS for which the area is in attainment.

TABLE 8.1-28
Commissioning Impacts Analysis—Maximum Modeled Impacts Compared to the Most Stringent Ambient Air Quality Standards, Facility-Wide Emissions

	VPP Impact	MGS impact	Background	Total Ground-level Concentration	Most Stringent AAQS
1-hour NO_2	90.6	21.8	244.6	357	470
1-hour CO	288.6	40.5	13,742	14,071	23,000
8-hour CO	39.3	1.2	8,360	8,400	10,000
1-hour SO_2	1.1	0.33	209	211	655
3-hour SO_2	0.8	NA	47.1	47.9	1,300
24-hour SO_2	0.12	0.06	39.3	39.5	105
24-hour PM_{10}	1.1	1.9	81.0	84.1	50
24-hour $PM_{2.5}$	1.1	1.9	55.8	58.9	65

Note:

- 1st highest modeled concentrations were used.
- All exceedance are due to the high background concentrations which already exceeded the ambient air quality standard.
- Background concentrations were the highest concentrations monitored during 2003 - 2005.
- Maximum impacts from MGS operation were from Table AIR QUALITY Table 16 of MGS FSA.

Modeling Results Demonstrating Compliance with the SCAQMD New Source Review Requirements

The SCAQMD has two new source review rules that require a demonstration of a project's compliance with ambient air quality standards or significant change in air quality concentration criteria. The first is Rule 1303 (the requirement section of Regulation XIII-New Source Review) and the second is Rule 2005 (the requirement section of Regulation XX-New Source Review). This section demonstrates the Project's compliance with the modeling aspects of these two rules.

Rule 1303 Compliance

To demonstrate compliance with SCAQMD modeling requirements of Rule 1303, Table 8.1-29 presents the maximum ambient air quality impacts for the VPP and MGS turbines compared to the SCAQMD's significance thresholds for nonattainment pollutant. Table 8.1-29 shows the maximum VPP and MGS modeled impacts for PM_{10} will not exceed the SCAQMD significance thresholds. Therefore, the project's PM_{10} impacts are not considered significant impacts as defined by the SCAQMD.

TABLE 8.1-29
Normal Operation Impacts Analysis for VPP and MGS—SCAQMD Rule 1303 (Maximum Modeled Impacts)
Individual CTG Analysis

Pollutant	Averaging Time	Maximum VPP and MGS CTG Impact (µg/m^3)	SCAQMD Rule 1303 Significance Threshold (µg/m^3)	Significant?
PM_{10}	24-hour	1.41	2.5	No
	annual*	0.41	1.0	No

* Annual Arithmetic Mean

Rule 2005 Compliance

To determine compliance with the SCAQMD's Rule 2005 (New Source Review for RECLAIM) ambient air quality impacts, the project impacts are compared to the NO_2 AAQS of 470 µg/m^3 on a 1-hour basis and 100 µg/m^3 on an annual basis. As shown in Table 8.1-30, the total NO_2 impacts do not exceed the SCAQMD's Rule 2005 significance threshold.

TABLE 8.1-30
Normal Operation Impacts Analysis for VPP and MGS—SCAQMD Rule 2005 (Maximum Modeled Impacts)
Individual CTG Analysis

Pollutant	Averaging Time	Maximum VPP and MGS CTG Impact (µg/m^3)	SCAQMD Rule 1303 Significance Threshold (µg/m^3)	Significant?
NO_2	1-hour	454	470	No
	annual	59.1	100	No

8.1.5.2.5 PSD Increment Consumption

The Prevention of Significant Deterioration (PSD) program was established to allow emission increases (increments of consumption) that do not result in significant deterioration of ambient air quality in areas where criteria pollutants have not exceeded the National Ambient Air Quality Standards (NAAQS). For the purposes of determining applicability of the PSD program requirements, the following regulatory procedure is used.

Project emissions are evaluated to determine whether the potential increase in emissions will be significant. Because this facility is a new major facility, the level of emissions that requires an analysis of ambient impacts is determined on a pollutant-specific basis. The emissions increases are those that will result from the proposed new equipment. For new facilities that include large gas turbines with fired HRSGs, USEPA considers a potential increase of 100 tons per year of any of the criteria pollutants to be significant. VPP is considered a new major source for NO_X and CO. Therefore, if the PSD significance levels are exceeded, an analysis is required to demonstrate that the allowable increments will not be exceeded, on a pollutant-specific basis. Increments are the maximum increases in concentration that are allowed to occur above the baseline concentration. Table 8.1-31 compares the maximum modeling impacts to PSD significant impact levels. The project's SO_2 emissions were below the PSD significant emission rate level, but the SO_2 impacts are also shown in Table 8.1-31 for informational purposes. These comparisons show that these impacts are below all significance thresholds and no further analysis is required.

TABLE 8.1-31
PSD Levels of Significance*

Pollutant	Averaging Time	Significant Impact Levels ($\mu g/m^3$)	Maximum VPP Project Impact ($\mu g/m^3$)
NO_2	annual	1	0.41
SO_2	3-hour	25	0.59
	24-hour	5	0.13
	annual	1	0.04
CO	1-hour	2,000	213
	8-hour	500	12.4

* Sulfur dioxide is not subject to PSD review, but is included for informational purposes.

8.1.5.3 Health Risk Assessment

For the purposes of determining the potential maximum ambient concentrations of chemical substances that may be emitted, VPP chemical substance emissions were modeled with the combustion turbines operated at base load at ambient temperature of 65°F. Duct burner fuel usage was incorporated into the chemical substance emission estimates assuming 8,760 hours of turbine and duct burner operations per year. The emission estimates also assumed the cooling tower was operated at the maximum recirculation rate of 120,773 gallons per minute for 8,760 hours per year and that the emergency fire pump was operated at the maximum allowable hours per year of 50 for maintenance testing. These operating conditions represent the maximum emissions profile (being permitted) for the VPP.

Potential impacts associated with emissions of chemical substances of potential concern into the air from the proposed facility were addressed in a health risk assessment, presented in Appendix 8.6B. The health risk assessment was prepared using guidelines developed under the SCAQMD's July 2005 *Risk Assessments Procedures for Rules 1401 and 212 Version 7* and the procedures included in the *SCAQMD's July 2005 Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588)*. Those guidelines supplement the *Air Toxics Hotspots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2003) and the CARB Recommended Interim Risk Management Policy for Inhalation-based Residential Cancer Risk (CARB 2003). The chemical substances of concern that were addressed in the assessment are listed in Table 8.1-19.

Emissions of substances of potential concern that may be associated with the proposed facility (gas-fired turbines and emergency diesel firewater pump) were estimated using emission factors approved by the SCAQMD. Cooling tower emissions of substances of potential concern were estimated based on a mass balance technique using the water supply quality, cooling tower maximum cycles of concentration, water recirculation rate, and mist eliminator drift rate. Emissions from the oil/water separator are not included in this analysis as they are estimated to be negligible and are not expected to contain toxic air contaminants.

Concentrations of these substances in ambient air associated with the potential emissions were estimated using the SCAQMD-approved HARP software package. HARP includes the USEPA's ISCST3 dispersion model, which estimates both short-term and long-term average ambient concentrations, at receptor locations, for use in a risk assessment. ISCST3 accounts for site-specific terrain, meteorological conditions, and emissions parameters (such as stack exit velocities and temperatures) to estimate ambient concentrations. Health risks potentially associated with the estimated concentrations of chemical substances in ambient air were characterized in terms of excess lifetime cancer risks (for substances listed by OEHHA as cancer causing), or comparison with reference exposure levels for non-cancer health effects (for substances listed by OEHHA with non-cancer causing effects).

The term Maximum Exposed Individual (MEI)[2] is taken from OEHHA risk assessment guidelines (OEHHA, 2003) and refers to an individual resident (MEIR) or worker (MEIW) that is located at the point where the highest ambient concentrations of modeled chemical substances associated with facility emissions are predicted. Cancer risk and non-cancer health hazard were estimated for both the MEIR and the MEIW based on the modeled ambient concentrations of substances of potential concern.

Receptor locations were evaluated to be residential or industrial, based on aerial photographs of the vicinity surrounding the facility. OEHHA risk assessment guidelines (OEHHA 2003) also require that, cancer risk and non-cancer health hazard values at each sensitive receptor (such as schools, hospitals, daycare centers) located within the zone of impact be estimated, where the zone of impact included the region surrounding the facility modeled to show a potential maximum added lifetime cancer risk (all pathways 70-year exposure) of 1 in 1 million or greater. For non-carcinogens, the zone of impact is defined as bounding the area surrounding the facility modeled to show a potential hazard index of greater than or equal to 0.5. The analysis shows that there is no area with a cancer risk of greater than 1 in 1 million, nor is there a hazard index of greater than 1; therefore, there is no zone of impact.

The evaluation of potential non-cancer health effects from exposure to short-term and long-term concentrations in air was performed by comparing modeled concentrations at the MEIR and MEIW with reference exposure levels (RELs). An REL is a concentration in ambient air at or below which no adverse health effects are anticipated. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in air and the REL. This ratio is the hazard quotient. The inhalation cancer potency and oral slope factor values and RELs used to characterize health risks associated with modeled concentrations in

[2] The terms MEI, MEIR, and MEIW refer to a receptor location of maximum ambient exposure and do not incorporate a reference to cancer risk or to non-cancer acute or chronic exposures. In the SCAQMD, Rules 1401 and 1402 refer to Maximum Individual Cancer Risk (MICR) which, by OEHHA terminology would be termed the MEI for Cancer effects.

air are included in the HARP model and represent the *Consolidated Table of Office of Environmental Health and Hazard Assessment (OEHHA)/Air Resources Board (ARB) Approved Risk Assessment Health Values*.

This health risk assessment included potential health impacts from inhalation, skin contact, and oral pathways as required by OEHHA guidelines. Additionally, this assessment included highly-conservative assumptions such as a 70-year exposure duration for residential receptors and a 40-year exposure duration for commercial/industrial receptors. Additional conservative assumptions included extremely high exposure rates such as the 95th percentile breathing rate of 393 liters of air/kg-day were included.

Modeling showed that the maximum exposed individual resident(MEIR) excess lifetime cancer risk was 0.0867 in 1 million, and the maximum exposed individual worker (MEIW) excess lifetime cancer risk was 0.341 in 1 million. Excess lifetime cancer risks less than (10 in 1 million) are unlikely to represent public health impacts that require additional controls of facility emissions.

For residential receptors, PAH emissions from the diesel fire pump have the highest potential to contribute to the cancer impact; however, the contribution is less than 0.1 in 1 million. The dominant exposure pathway for PAHs is inhalation. All other substances from other sources contribute less than 0.01 in 1 million at the MEIR.

The hazard index for acute noncarcinogenic substances was 0.401. The hazard indices for chronic non-carcinogenic substances were 0.0154 for both the MEIR and MEIW.

To assess the potential combined public health impacts from the VPP and the Malburg Generating Station (MGS), the MEIR, MEIW, and hazard index from both projects were added together[3]. Assessing the combined operation of the MGS and VPP projects using the highest impacts from both facilities results in a conservative assessment as it is unlikely that the MEIRs and MEIWs occur at the same locations. The resulting assessment indicated a maximum combined acute MEIR of 0.46, a chronic MEIR and MEIW of 0.047, a combined acute MEIW of 0.49, and a total excess lifetime cancer risk of 1.3 in 1 million. The total excess lifetime cancer risk is below the significance threshold of 10 in a million; therefore, the combined operation of VPP and MGS is not expected to have significant public health impacts.

Section 8.6 of this AFC contains a detailed public health analysis, including the HARP results.

8.1.5.4 Class I Area Impact Analysis

The Class I area impact modeling analysis was conducted in accordance with the air dispersion modeling protocol developed for the VPP project, which was provided to the Federal Land Manager for the San Gabriel and Cucamonga Class I areas, Mike McCorison, U.S. Forest Service Southern California. PSD requires evaluation of impacts to Class I areas. Two types of impacts are required for all Class I areas within 100 km of the proposed project site: Class I PSD increments and impacts to air quality related values (AQRVs), including visibility, acidic deposition, and regional haze. The analyses were conducted based on guidance from the following documents:

[3] Public health data for Malburg Generating Station were taken from the MGS Final Staff Assessment, Public Health Table 2, page 4.7-13. MGS Final Staff Assessment, September 2002 (01-AFC-25).

- *Interagency Workgroup on Air Quality Modeling Phase 2 Summary Report and Recommendations for Modeling Long range Transport Impacts* (EPA-545/R-98-019) (IWAQM2)
- *Federal Land Managers Air Quality Related Values Work Group Phase I Report* (USFS,NPS, USFWS, 2000) (FLAG)

The Class I areas that are within 100 km of the proposed project site are listed in Table 8.1-32.

TABLE 8.1-32
Nearby Class I Areas

Class I Area	Distance (km)
San Gabriel	31
Cucamonga	58

8.1.5.4.1 Source Inputs

Emissions for each modeled source are presented in Table 8.1-33. Source characteristics are summarized in Table 8.1-34. The VPP project is only subject to PSD review for NO_x and CO, due to the emission levels of these pollutants. However, comments received from the Federal Land Manager on the air dispersion modeling protocol requested that SO_2 and PM_{10} emissions be included in the Class I impact analysis.

TABLE 8.1-33
Emission Rates used in CALPUFF

Source	Emission Rates for SO_2 (lb/hr)	Emission Rates for NO_x (lb/hr)	Emission Rates for PM_{10} (lb/hr)
24-hour Emission Rates[a]			
Stack 1	1.26	17.53	12
Stack 2	1.26	17.53	12
Fire-Pump	1.080E-03	9.653E-01	1.736E-02
Cooling Tower (each cell)	-	-	1.07E-01
Annual Emission Rates[b]			
Stack 1	1.33	18.88	13
Stack 2	1.33	18.88	13
Fire-Pump	6.164E-06	5.510E-03	9.909E-05
Cooling Tower (each cell)	-	-	1.07E-01

[a] 24-hour turbine emissions based on operating at 65°F with duct burners firing. Fire pump emissions based on 1 half-hour per day of testing. Cooling tower emissions are based 1.07 lb of PM_{10}/hour divided by 10 cooling tower cells.

[b] Annual turbine emissions based on operating at 65°F with duct burners firing. Fire pump emissions based on 50 hours per year of testing divided by 8,760 hours. Cooling tower emissions are based annual PM_{10} emissions of 4.3 tons per year divided by 10 cooling tower cells.

TABLE 8.1-34
Source Characteristics

Stack Name	Stack ID	Stack Height (m)	Diameter (m)	Velocity (m/s)	Temperature (K)
Combustion Turbine #1	CTG1	54.86	6.09	18.17	365
Combustion Turbine # 2	CTG2	54.86	6.09	18.17	365
Fire-Pump	FP	10.7	0.076	108.77	765
Cooling Tower	CT	17.68	9.14	6.482	307.21

8.1.5.4.2 CALPUFF Model

The Class I area air quality modeling was performed using the CALPUFF modeling system. A full, refined CALPUFF modeling analysis was performed. The modeling utilized detailed terrain and land use data and three years of the meteorological data: mesoscale (i.e MM5) data, surface station data from two sites, and precipitation data from 32 sites. Details of the CALPUFF modeling are contained in the Vernon Power Plant Modeling Protocol (Appendix 8.1B) and 5 compact diskettes with the electronic modeling files are being submitted under a separate cover. The protocol incorporates comments received from the Federal Land Manager, Mike McCorison.

Results from Refined CALPUFF

Visibility—As recommended in the Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report (December 2000), regional haze analyses were performed for the San Gabriel and Cucamonga Class I areas, which are located within 100 km from the proposed project site. A full, refined CALPUFF modeling analysis was performed to evaluate potential visibility impacts (haze) of the proposed project on the nearest Class I areas, as discussed above.

Emissions—Emissions used in the modeling analysis of visibility impacts are the same as those used for the criteria pollutant modeling analysis. The parameters modeled for the visibility impacts assume that the particulate nitrate (NO_3-) is in the form of ammonium nitrate (NH_4NO_3) and that particulate sulfate (SO_4-) is in the form of ammonium sulfate ($(NH_4)2SO_4$). The visibility calculation is based on the ambient concentrations of NH_4NO_3, $(NH_4)2SO_4$, and PM_{10}, along with a representative relative humidity adjustment factor. The PM_{10} was speciated, as recommended by the USDA FS, as indicated in Table 8.1-35.

TABLE 8.1-35
PM Speciation for Natural-Gas Fired Combustion Turbine
Provided by USDA FS (October, 2005)

Filterable vs. Condensable		Recommended PM Profile				
Filterable	Condensable (CPM)	SO_4*	EC	SOA	PMF	PMC
0.25	0.75	Site-specific data, or $0.33SO_2$*	0.25	CPM-SO_4	0.0	0.0

* SO_4 should be adjusted to account for the molecular weight difference between SO_2 and SO_4 (96/64). SO_4 assumed to be 100% of inorganic CPM unless site-specific data indicates otherwise.

Impacts

The maximum 24-hour visibility impact was generated by taking the maximum 24-hour average modeled emission scenario, regardless of the season in which it occurred, and assigning it to represent the visibility impact at the Class I areas. Class I visibility impacts are given in Table 8.1-36. Preliminary results showed only one day in the San Gabriel Wilderness Area with maximum percent change in extinction greater than 5 percent. The Cucamonga Wilderness Area visibility impacts are less than the 5 percent extinction criteria for all days over the 3-year modeling period. When the evaluation method was refined to include the effect of natural visibility decrease due to precipitation during this 24-hour period, the maximum change in extinction for December 6, 2003 becomes 0.56 percent.

TABLE 8.1-36
Class I Visibility Results for San Gabriel and Cucamonga Class I Areas

Year	Number of Days with Change in Extinction greater than 5 Percent	Maximum % Change in Extinction	Day of Maximum Extinction
Final CALPUFF Modeling Results for the San Gabriel Wilderness Area			
2001	0	3.82	January 24th (24)
2002	0	4.19	April 15th (105)
2003	1*	5.27 *	December 6th (341)
Final CALPUFF Modeling Results for the Cucamonga Wilderness Area			
2001	0	2.86	January 24th (24)
2002	0	2.77	December 14th (348)
2003	0	2.60	June 7th (158)

* This is prior to accounting for natural decreases in visibility. When this effect is included in the analysis, the percent change in extinction for this day due to impacts from the proposed project is 0.56 percent.

The results of the Class I prevention of significant deterioration (PSD) increment analysis are presented in Tables 8.1-37 and 8.1-38. All maximum modeled concentrations are well below the EPA proposed Class I significance levels and Class I Increments. As noted above, the VPP project is not subject to PSD review for SO_2 and PM_{10}, and these pollutants are included in this analysis at the request of the Federal Land Manager.

TABLE 8.1-37
Class I PSD Increment Results, San Gabriel
Final CALPUFF Modeling Results, Vernon Power Plant Facility

Year	SO_2 Annual ($\mu g/m^3$)	SO_2 24-hour ($\mu g/m^3$)	SO_2 3-hour ($\mu g/m^3$)	PM_{10} Annual ($\mu g/m^3$)	PM_{10} 24-hour ($\mu g/m^3$)	NO_x Annual ($\mu g/m^3$)
2001	0.000838	0.00575	0.0177	0.0133	0.0961	0.00511
2002	0.000707	0.00463	0.0154	0.0120	0.0747	0.00357
2003	0.000668	0.00494	0.0144	0.0109	0.0785	0.00356

TABLE 8.1-37
Class I PSD Increment Results, San Gabriel
Final CALPUFF Modeling Results, Vernon Power Plant Facility

Year	SO_2 Annual ($\mu g/m^3$)	SO_2 24-hour ($\mu g/m^3$)	SO_2 3-hour ($\mu g/m^3$)	PM_{10} Annual ($\mu g/m^3$)	PM_{10} 24-hour ($\mu g/m^3$)	NO_x Annual ($\mu g/m^3$)
EPA Proposed Class I Significance Level	0.1	0.2	1.	0.2	0.3	0.1
Class I Increment	2	5	25	4	8	2.5

Note: PM_{10} includes the sum of elemental carbon (EC), fine particulates (FPM), coarse particulates (CPM), sulfate (SO_4), nitrate (NO_4), and secondary organic aerosols (SOA).

TABLE 8.1-38
Class I PSD Increment Results, Cucamonga
Final CALPUFF Modeling Results, Vernon Power Plant Facility

Year	SO_2 Annual ($\mu g/m^3$)	SO_2 24-hour ($\mu g/m^3$)	SO_2 3-hour ($\mu g/m^3$)	PM_{10} Annual ($\mu g/m^3$)	PM_{10} 24-hour ($\mu g/m^3$)	NO_x Annual ($\mu g/m^3$)
2001	0.000499	0.00269	0.00814	0.00929	0.0545	0.00274
2002	0.000506	0.00311	0.00954	0.00996	0.0632	0.00212
2003	0.000414	0.00278	0.00812	0.00770	0.0564	0.00233
EPA Proposed Class I Significance Level	0.1	0.2	1.	0.2	0.3	0.1
Class I Increment	2	5	25	4	8	2.5

Note: PM_{10} includes the sum of elemental carbon (EC), fine particulates (FPM), coarse particulates (CPM), sulfate (SO_4), nitrate (NO_4), and secondary organic aerosols (SOA).

The maximum Nitrogen and Sulfur deposition calculated at the two Class I areas are given in Tables 8.1-39 and 8.1-40. Nitrogen and Sulfur deposition are evaluated on a case-by-case basis by the Federal Land Manager.

TABLE 8.1-39
Nitrogen and Sulfur Deposition Results, San Gabriel
Final CALPUFF Modeling Results, Vernon Power Plant Facility

Year	Nitrogen Deposition (kg/ha-yr)	Sulfur Deposition (kg/ha-yr)
2001	6.14E-04	4.54E-04
2002	4.68E-04	3.29E-04
2003	5.70E-04	3.96E-04

TABLE 8.1-40
Nitrogen and Sulfur Deposition Results, Cucamonga
Final CALPUFF Modeling Results, Vernon Power Plant Facility

Year	Nitrogen Deposition (kg/ha-yr)	Sulfur Deposition (kg/ha-yr)
2001	3.99E-04	2.68E-04
2002	3.88E-04	2.44E-04
2003	3.04E-04	2.14E-04

8.1.5.5 Construction Impacts Analysis

The emissions from the construction phase of the project were estimated, including an assessment of emissions from vehicle and equipment exhaust and the fugitive dust generated from material handling. The criteria pollutant concentrations related to construction activities were predicted using the emission rate estimates and the ISCST3 dispersion model. Background concentrations were added to the each of the maximum ISCST3 concentrations and the total predicted concentrations were compared to the air quality standards in Table 8.1-41. A detailed summary of the assumptions and emission factors used to estimate the construction phase emissions and the details of the dispersion modeling approach are presented in Appendix 8.1C.

The results of the analysis (Table 8.1-41) indicate that the maximum construction impacts will be below the ambient air quality standards for each of the criteria pollutants and averaging periods with the exception of the 24-hour $PM_{2.5}$ and the annual PM_{10} and $PM_{2.5}$ averaging periods. For annual $PM_{2.5}$, the background concentration also exceeds the ambient air quality standards. Based on the results of the analysis, approximately 85 percent of the particulate concentrations will be due to fugitive dust emissions. The assumptions used to estimate the project's fugitive emissions are conservative in nature and the fugitive dust control efficiencies expected to be achieved during construction are higher than those used in the emissions estimate.

TABLE 8.1-41
Maximum Modeled Impacts from Construction and the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum ISCST3 Concentration[a] ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2	1-hour	177[a]	245	422	470	-
	annual	40.5[b]	58.3	99	-	100
PM_{10}	24-hour	53	81	134	50 [c]	150
	annual	17	34.6	52	20	50
$PM_{2.5}$[d]	24-hour	16	55.8	72	-	65
	annual	6	20.2	26	12	15
CO	1-hour	1704	13,742	15,446	23,000 (20 ppm)	40,000
	8-hour	506	8,360	8,866	10,000 (9 ppm)	10,000

TABLE 8.1-41
Maximum Modeled Impacts from Construction and the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum ISCST3 Concentration[a] ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
SO_2	1-hour	6.5	209	216	655	-
	24-hour	0.8	39.3	40	105	365
	annual	0.2	5.2	5	-	80

[a] Reported the 1st High Concentration from ISCST3 output with the exception of the 1-Hour NO_2 concentration. The maximum 1-hour NO_2 concentration was derived from the modeled 1-hour NO_x concentrations at each receptor and the NO_2 to NO_x ratios as a function of downwind distance, as discussed in the SCAQMD "Localized Significance Threshold Methodology (LST)", June 2003.

[b] Annual NO_2 concentration was obtained by using a factor of 75 percent to convert NO_x to NO_2, according to the Guideline on Air Quality Models (40 CFR, Part 51, Appendix W, April 15, 2003)

[c] Because the entire SCAQMD is non-attainment for the state PM_{10} standard, background concentrations are not used to determine significance relative to the state standard. The incremental 24-hour PM_{10} impacts from construction are derived based on the change in concentration threshold of 10.4 ($\mu g/m^3$). (Based on the control requirement of 50 $\mu g/m^3$ and the simultaneous sampling requirement of 5 hours in SCAQMD Rule 403, SCAQMD LST, June 2003)

[d] Reported $PM_{2.5}$ concentration from exhaust and fugitive sources assumes all PM from exhaust emissions are less than 2.5 micron and for fugitive emissions, 21% of the fugitive PM emissions are less than 2.5 micron (SCAQMD LST, June 2003).

8.1.6 Consistency with Laws, Ordinances, Regulations, and Standards

8.1.6.1 Consistency with Federal Requirements

The SCAQMD has been delegated authority by the USEPA to implement and enforce most federal requirements that are applicable to the project, including the New Source Performance Standards. However, the SCAQMD relinquished its delegated authority for PSD review. Compliance with the SCAQMD regulations ensures compliance and consistency with the corresponding federal requirements. However, a separate PSD application will also be submitted to the USEPA.

The project will also be required to comply with the Federal Acid Rain requirements (Title IV). Since the SCAQMD has received delegation for implementing Title IV through its Title V permit program, VPP will secure a SCAQMD Title V permit that incorporates the necessary requirements for compliance with the Title IV Acid Rain provisions.

As discussed in AFC Subsection 8.1.5, Laws, Ordinances, Regulations and Standards, the federal PSD program requirements apply on a pollutant-specific basis to the following:

- A new major facility that will emit 100 tpy or more, if it is one of the 28 PSD source categories in the federal Clean Air Act, or a new facility that will emit 250 tpy or more; or
- A major modification to an existing major facility that will result in net emissions increases in excess of significant emissions levels.

The proposed project is a new major facility and is subject to PSD review for NO_x and CO (based on the SCAQMD's redesignation request), because emissions of those pollutants exceed the 100 tpy significance thresholds.

Because the project is subject to PSD review for NO_x and CO, the facility is required to use BACT to control these pollutants. The discussion of BACT for NO_x and CO is provided below in Subsection 8.1.6.3.

40 CFR § 52.21 (k) requires that the modeling be conducted with appropriate meteorological and topographic data necessary to estimate impacts. The modeling analyses used USGS Digital Elevation Model (DEM) data (i.e., 30-meter spacing between grid nodes) for the surrounding area and SCAQMD 1981 meteorological data from the City of Vernon Meteorological Monitoring Station.

40 CFR § 52.21 (k) also requires a demonstration that emission increases subject to the PSD program will not interfere with the attainment or maintenance of any NAAQS for each applicable pollutant. As shown in Tables 8.1-27 and 8.1-31, the proposed project will not cause an exceedance of any federal ambient air quality standard for which the SCAQMD is in attainment of the standards nor result in a significant ambient air quality impact.

For an application that triggers PSD modeling requirements, 40 CFR §52.21 (m) requires that ambient monitoring data be gathered for 1 year preceding the submittal of a complete application, or an USEPA-approved representative time period. However, if the air quality impacts of the facility do not exceed the specified *de minimis* levels, on a pollutant-specific basis, the facility is exempted from the preconstruction monitoring requirement. The air quality impacts of the project's NO_x and CO emissions are below the applicable *de minimis* levels, as shown in Table 8.1-29, and therefore, the preconstruction monitoring requirements are not applicable.

40 CFR § 52.21(o) requires the Applicant to provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the proposed project. The visibility impact assessment is presented in Subsection 8.1.5.3, and as project vicinity is completely urbanized, impacts to soils and vegetation of commercial value are not expected. However, an analysis of the impacts to biological, soils and agriculture resources are presented in Subsections 8.2 and 8.9 of the AFC, respectively.

40 CFR § 52.21(p) requires applications to demonstrate that emissions from a new or modified facility will not cause or contribute to the exceedances of any NAAQS or any applicable Class I PSD increment. Impacts on visibility must also be evaluated for Class I areas within 100 km of the facility. The nearest Class I area is 31 km from the proposed facility. Therefore, additional impacts analyses are required.

New Source Performance Standards: 40 CFR 60 Subparts Da and GG of this rule require monitoring of fuel; impose limits on the emissions of NO_x, PM, and SO_2; and require source testing of stack emissions, process monitoring, and data collection and recordkeeping. All of the BACT limits will be more stringent than the requirements of the NSPS emission limits. Monitoring and recordkeeping requirements for BACT (Rules 1303, 2005), Title V (Regulation XXX) and the RECLAIM program (Regulation XX) will be more stringent than the requirements in this rule; therefore, the facility will comply with the NSPS regulations.

Acid Rain, 40 CFR 75, SCAQMD Regulation XXXI: Applications for Title IV will be made concurrent with the Title V and the NSR applications submitted to the SCAQMD. Monitoring and CEMS requirements imposed to ensure compliance with BACT, Title V and RECLAIM requirements will incorporate the CEMS and monitoring requirements of Title IV. Once the facility begins operation, it will acquire Title IV SO2 Credits, as required by this program.

8.1.6.2 Consistency with State Requirements

State law sets up local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. As discussed above, the project is under the local jurisdiction of the District, and compliance with SCAQMD regulations will ensure compliance with state air quality requirements.

8.1.6.3 Consistency with Local Requirements: South Coast Air Quality Management District

The SCAQMD has been delegated responsibility for implementing local, state, and federal air quality regulations in the portions of four counties[4] within the SCAQMD. The project is subject to SCAQMD regulations that apply to new sources of emissions, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from toxic air pollutants. The following subsections include the evaluation of facility compliance with the applicable SCAQMD requirements.

Under the CEC's AFC program, VPP is required to secure a preconstruction Determination of Compliance (DOC) from the SCAQMD. Because of the Title V and NSR permitting requirements, the SCAQMD will be requested to provide the CEC with a DOC in addition to processing its own permit applications related to the VPP project. The preconstruction DOC review includes demonstrating that the project will use best available control technology (BACT) and will provide any necessary emission offsets.

Applicable BACT levels are shown in Table 8.1-42, along with anticipated potential facility emissions. SCAQMD Rule 1303 requires the project to apply BACT for emission increases of NO_x, VOC, SO_x, CO, and PM_{10} (criteria pollutants), as well as ammonia. Through long-standing administrative policy, the increase threshold per permit unit for applicability of the BACT requirement is 1 lb/day. As shown in the table, BACT is required for NO_x, VOC, SO_2, CO, PM_{10}, and ammonia. The calculation of facility emissions was discussed in AFC Subsection 8.1.5.1.1.

TABLE 8.1-42
Best Available Control Technology Requirements

Pollutant	Applicability Level	Permit Units Exceeding this Level	BACT Required?
Criteria Pollutants: SCAQMD Rules 1303 and 2005			
VOC	1 lb/day/Permit Unit	CTGs, Emergency Fire Pump Engine	Yes
NO_x	1 lb/day/Permit Unit	CTGs, Emergency Fire Pump Engine	Yes
SO_2	1 lb/day/Permit Unit	CTGs, Emergency Fire Pump Engine	Yes
PM_{10}	1 lb/day/Permit Unit	CTGs, Emergency Fire Pump Engine	Yes
CO	1 lb/day/ Permit Unit	CTGs, Emergency Fire Pump Engine	Yes
Ammonia	1 lb/day/ Permit Unit	CTGs	Yes

BACT for the applicable pollutants was determined by reviewing the SCAQMD BACT Guidelines Manual, the Compilation of California BACT Determinations, CAPCOA (2nd Ed., November 1993), and USEPA's RACT/BACT/LAER Clearinghouse (RBLC).

[4] Including the portion of Kern County that is within SCAQMD boundaries.

A summary of the review is provided in Appendix 8.1D. For the gas turbines and duct burners, the SCAQMD considers BACT to be the most stringent level of demonstrated emission control that is feasible. The project will use the BACT measures discussed below.

As a BACT measure, the Applicant will limit the fuels burned at the project to natural gas, a clean burning fuel. Liquid fuels will not be fired at VPP except only in the emergency fire pump. Burning of liquid fuels in the gas turbine combustors and duct burners would result in greater criteria pollutant emissions than if the units burned only gaseous fuels. This measure acts to minimize the formation of all criteria air pollutants.

BACT for NO_x emissions from the gas turbine will be the use of low NO_x emitting equipment and add-on controls. The Applicant has selected a gas turbine equipped with state-of-the-art ultra low NO_x combustors. The gas turbine ultra low NO_x combustors will generate approximately 9 ppmvd NO_x, engine out, corrected to 15 percent O_2. In addition, the turbines will be equipped with a selective catalytic reduction (SCR) system to further reduce NO_x emissions to 2 ppmvd NO_x, corrected to 15 percent O_2 on a 1-hour average basis (excluding startups and shutdowns). The current SCAQMD BACT/LAER requirement for cogeneration and combined cycle gas turbines is 2 ppmvd over a 1-hour averaging period. Therefore, the project will meet the BACT requirements for NO_x. Note that the ANP Blackstone Project, used by the SCAQMD in making its determination, was not equipped with duct burners. Nevertheless, the exhaust from the duct burners in this project will also be controlled by the SCR systems and the entire combined exhaust is being designed to comply with the 2 ppmvd BACT level. The SCAQMD BACT Guideline determination for NO_x from gas turbines is shown in Appendix 8.1D.

BACT for CO emissions will be achieved by use of gas turbines equipped with ultra low NO_x combustors and an oxidation catalyst. Ultra low NO_x combustors emit low levels of combustion CO while still maintaining low NO_x formation. In addition, the project will use an oxidation catalyst system to further reduce CO emissions to 2 ppmvd, corrected to 15 percent O_2. The Applicant has specified a CO limit of 2 ppmvd, corrected to 15 percent O_2, for base load and part load operation above 60 percent. Based on the ANP Blackstone Project, the SCAQMD adopted a BACT requirement for cogeneration and combined cycle gas turbines of 3 ppmvd over a 1-hour averaging period. While the ANP Blackstone Project did not include duct burners, the combined gas turbine and duct burner exhaust from this project will be controlled by the oxidation catalyst to 2 ppmvd at 15 percent O_2, which complies with the SCAQMD BACT level. For all operating levels at and above 60 percent load, the CO emission rate from the gas turbines and duct burners at the outlet of the exhaust stacks will not exceed 2 ppmvd, corrected to 15 percent O_2, except under startup and shutdown conditions. A review of recent BACT determinations for CO from gas turbines is provided in Appendix 8.1D.

BACT for VOC emissions will be achieved by use of the gas turbine ultra low NO_x combustors and an oxidation catalyst. As in the case of CO emission formation, ultra low NO_x combustors use air to fuel ratios that result in low combustion VOC while still maintaining low NO_x levels. The oxidation catalyst will further reduce the VOC emissions in the exhaust gases. BACT for VOC emissions from combustion devices has historically been the use of best combustion practices. With the use of the ultra low NO_x combustors and with the duct burner emission level, VOC emissions leaving the stacks will not exceed

2.0 ppmvd, corrected to 15 percent oxygen, for base load and part load operation above 60 percent. This level of emissions is consistent with the SCAQMD's BACT guidelines for large gas turbines. Note that the 2 ppmvd BACT level was based on testing methodology other than that traditionally used by the SCAQMD (Method 25.3). The SCAQMD has modified its testing requirements for gas turbines to be more consistent with the tests done in other jurisdictions in meeting the 2 ppmvd VOC BACT emissions level.

For the turbines and duct burners, BACT for PM_{10} is best combustion practices and the use of gaseous fuels. As mentioned, use of clean burning natural gas fuel will result in minimal particulate emissions.

SO_2 emissions will be kept at a minimum by firing clean burning natural gas fuel.

The SCAQMD imposes an ammonia slip limit of 5 ppmvd as a BACT limit for that pollutant. While offsets are not required for ammonia emissions, the SCAQMD's NSR Rule (Regulation XIII) that regulates emissions of ammonia and BACT, is required. The project will be designed and operated to meet the stringent 5 ppmvd ammonia slip requirement. Also, as required by the SCAQMD for aqueous ammonia storage tanks used in SCR service, the storage tank will be equipped with a pressure relief valve and the storage tank will be vented back to the tank on the delivery truck when the storage tank is being filled.

The SCAQMD's BACT Guidelines for emergency internal combustion compression ignition engines specifies that engines in the horsepower size of the VPP project (210 bhp) meet USEPA Off Road Tier 2 emission standards. The Cummins engine used in this analysis is a Tier 2 engine and meets these requirements. As required by the NSR program, BACT cannot be less stringent than other source specific or prohibitory rules. Rules 431.2 and 1470 will require that fuel supplied to this engine comply with a fuel sulfur limit of 15 ppmvd. Such fuel is readily available in the South Coast Air Basin and this requirement will be met. Rule 1470 also requires that the PM_{10} emissions from the engine be limited to 0.15 gr/bhp-hr. The Tier 2 PM_{10} level is 0.15 gr/bhp-hr and complies with this limit. BACT requirements will be satisfied through use of a Tier 2 engine.

SCAQMD Rule 219 exempts the cooling towers from SCAQMD permitting requirements. Nevertheless, the cooling towers will be designed with a drift eliminator efficiency of 0.0005 percent, which should comply with all BACT requirements. This control efficiency has been proposed by similar projects that have recently been approved.

The oil/water separator, while required to obtain an SCAQMD Permit to Construct, will have daily emissions of less than 1 pound per day. In accord with long standing SCAQMD administrative policy, increases of criteria pollutant emissions from a new or modified permit unit of less than 1 pound per day are exempted from BACT requirements.

In addition to the BACT requirements, SCAQMD Rule 1303 requires the Applicant to provide full emission offsets when emissions exceed specified levels on a pollutant-specific basis. SCAQMD Rule 2005 requires the Applicant to provide RECLAIM Trading Credits (RTC) for the project's NO_x emissions. As shown in Table 8.1-43, the project will be required to provide emission offsets for CO, SO_2, PM_{10}, and VOC emissions and RTCs for NO_x emissions.

TABLE 8.1-43
SCAQMD Offset Requirements and Project Emissions[a] (ref: Rule 1304(d)(1)(B), Rule 1303(b)(2), Rule 1304, Table A, Regulation 2005)

Pollutant	Offset Threshold	Offsets Required
VOC	4 ton/yr	443 lb/day ERCs
CO	29 ton/yr	1,462 lb/day ERCs
NO_x	4 ton/yr[b]	51,622 lb NO_x RTCs (Commissioning Phase) 320,324 lb NO_x RTCs (Normal Operation)[c]
PM_{10}	4 ton/yr	739 lb/day Priority Reserve Credits
SO_2	4 ton/yr	76.6 lb/day Priority Reserve Credits

[a] Excluding the emergency fire pump (VOC, CO, PM_{10}, and SO_2) emissions, which are exempt from SCAQMD offset requirements by Rule 1304(a)(4), Rule 2005, however, does not exempt the applicant from the requirement to provide RTCs to offset NOx emissions from the engine. As the cooling towers will be exempted from SCAQMD permitting requirements by Rule 219(e)(3) and Rule 219(s)(2), emission offsets are not required as indicated in Rule 1304(d)(3). In accordance with Rule 1303 ERCs are required at an offset ratio of 1.2:1, including Priority Reserve Credits.

[b] Proposed VPP will be in the SCAQMD NO_x RECLAIM program (Regulation XX). NO_x emissions will be offset through purchase of RTCs at a ratio of 1:1 to actual emissions per year.

[c] Normal Operation RTCs include the annual contribution from the emergency diesel fire pump engine.

The emergency fire pump engine is considered an emergency engine in accordance with Rule 1304(a)(4) and will be limited to operation not exceeding 200 hours per year. As such, the SCAQMD exempts the engine from dispersion modeling and offset requirements for CO, VOC, SO_2, and PM_{10}. The engine is considered a NO_x Process Unit under Regulation XX, RECLAIM, and NO_x emissions would still need to be offset through purchase of RECLAIM Trading Credits (RTCs).

As a Rule 219-permit exempt permit unit, the cooling towers are exempted from SCAQMD offset requirements by Rule 1304(d)(3).

Rule 1303(b)(2) requires Emission Reduction Credits (ERCs) to be provided at an offset ratio of 1.2 to 1 for credits purchased from open market and at a ratio of 1:1 for credits purchased from Priority Reserve. However, proposed Rule 1309.1 authorizes electric generating facilities (EGFs) access to the Priority Reserve for SO_x, CO, and PM_{10} but it also includes a modification that requires the Priority Reserve Credits be provided on a 1.2 to 1 ratio. Interpollutant offsets can be allowed, at the discretion of the APCO, primarily in cases where there is a precursor relationship.

To ensure that there was an adequate supply of emission offsets for essential public service projects (landfills, waste treatment plants, schools, hospitals, etc.) the SCAQMD created a Priority Reserve pool of credits with the June 1990 amendments to its New Source Review Regulation, Regulation XIII. As specified in Rule 1309, the SCAQMD maintains and funds this pool of credits that can be accessed at no cost by essential public services at an offset ratio of 1:1. Primarily, because of the severe shortage in PM_{10} ERCs to offset the large emissions increases from new power plants, the SCAQMD provided power projects access to purchase necessary offset credits from this pool of Priority Reserves. That initial access expired and the SCAQMD has prepared to modify Rule 1309.1, again, by providing access to the CO, PM_{10}, and SO_2 credits in the Priority Reserve. The proposed mitigation fees are

$12,000 per pound for CO, $15,083 per pound for SO_X, and $50,417 per pound for PM_{10}. The rule is currently scheduled to be heard at a public meeting in July 2006. Due to the limited supply of SO_2, CO, and PM_{10} ERCs that prompted the SCAQMD to propose reopening access to the Priority Reserve, VPP plans to purchase its required SO_2, CO, and PM_{10} emission offsets from the Priority Reserve.

Rule 1303 also requires project denial if air quality modeling results indicate emissions will cause a violation or make significantly worse an existing violation of the applicable ambient air quality standards. For nonattainment pollutants the significant change in air quality concentrations is presented in Rule 1303, Appendix A, Table A-2. The modeling analyses in Subsection 8.1.5.1 (Table 8.1-28) show that the facility emissions will not interfere with the attainment or maintenance of the applicable air quality standards. Because the SCAQMD is currently a nonattainment area for PM_{10}, an increase in PM_{10} emissions has the potential to exacerbate existing violations. However, the Applicant will be providing PM_{10} offsets to mitigate the impact of the emissions increase; as a result, the required finding can be made for PM_{10} as well. Furthermore, comparing the project's impacts with the SCAQMD's PM_{10} significance thresholds shows that the project will not result in a significant PM_{10} ambient air quality impact.

As VPP will be located in Trading Zone 1, better known as the Coastal Zone, Rule 1303 restricts the purchase of ERCs for this project to emission reductions that were generated in the Coastal Zone. The SCAQMD ERC listing in Appendix 8.1E provides the required information for offset identification and amount issued with each certificate. This list contains the current SCAQMD ERCs that may be purchased and used as offset mitigations for project CO and VOC emission increases. The information includes:

- Ownership of emission offset credits; and
- Emission reduction credits granted by the SCAQMD that have been determined to meet the SCAQMD's requirements for bankable offsets. Note that unlike some other California air districts, the SCAQMD goes through a stringent surplus evaluation to discount emission reductions before ERCs are granted. No further reduction, other than the offset ratio, is applied when ERCs are purchased and used as mitigation for project emissions increases.

While a single listing of all NO_x RTCs by year is not presently available from the SCAQMD, a figure obtained from a SCAQMD February 2, 2005 presentation, which lists the NO_x RTCs issued by year on a ton per day basis, is included in Appendix 8.1E. This figure incorporates the NO_x RTC "shave" that will occur as a result of changes in the RECLAIM program adopted by the SCAQMD in January 2005.

VPP plans to purchase VOC ERCs and NO_x RTCs from the market, through the established broker network that has evolved to serve this market to satisfy the NO_x RTC, and VOC ERC offset requirements. The SCAQMD has requested redesignation for the CO status from non-attainment to attainment. If the basin is redesignated as attainment of the CO standard, then this pollutant will be subject to the PSD regulations. In anticipation of this redesignation, CO will be included in the project's PSD permit application. When the SCAQMD is redesigned as attainment of the CO standard, CO ERCs will not be required for the VPP. There has been a recognized shortage of CO, PM_{10}, and SO_2 ERCs. As a result, the

SCAQMD has developed proposed modifications to Rule 1309.1, which are presently scheduled for a public workshop on the proposed Rule in July 2006. The proposed rule modification will enable power projects, such as VPP, to access and acquire at cost the necessary PM_{10}, SO_2, and CO (if required) credits to satisfy offset requirements. VPP plans to satisfy its PM_{10}, SO_2, and CO (if required) offset requirements from the Priority Reserve pool of credits upon adoption of the Rule 1309.1 modifications.

Acid Rain Offsets: The Phase II acid rain requirements of Regulation XXXI are also applicable to the facility. As a Phase II Acid Rain facility, VPP will be required to provide sufficient allowances for every ton of SO_2 emitted during a calendar year. The Applicant will obtain any necessary allowances on the current open trade market upon operation of the plant.

Rule 1401: As demonstrated in Subsection 8.6 of this AFC, the permit units required to be analyzed for compliance with the requirements of this rule will not cause the Acute or Chronic Health Index to exceed 1.0 for any organ group at any offsite receptor location. While controls and operations that would qualify as T-BACT will be employed in the design and operation of this project, excess cancer risk will not exceed a threshold of 1 in 1 million. Cancer burden, as required, does not exceed 0.5. Rule 1401 exempts the emergency fire pump engine from the risk assessment requirements, as the engine would be covered under the Rule 1304(a)(4) exemptions from modeling and offsets. A risk assessment of emissions from the cooling tower was conducted to ensure that acute, chronic and cancer risks did not exceed the Rule 1401 thresholds. This demonstration preserved the Rule 219 permit exemption status for the cooling towers, as required by Rule 219(s)(2).

The general prohibitory and source-specific rules of the SCAQMD applicable to the project and the determination of compliance follow.

Rule 218: Each gas turbine will be equipped with a CEMS. These units will comply with all applicable requirements of Rule 218, Rule 2012 (NO_x RECLAIM) and Title IV (Acid Rain—40CFR75).

Rule 219: The cooling tower will be exempted from permitting through Rule 219(e)(3) and Rule 219(s)(2). A risk evaluation determined that risk level associated with the cooling towers do not exceed the acute, chronic or cancer risk thresholds of Rule 1401. Therefore, the permit exemption is confirmed.

Rule 401—Visible Emissions: Because natural gas will be used as a fuel, the VPP turbines will not generate visible emissions as dark as or darker than Ringlemann No. 1 for periods greater than 3 minutes in any hour. As a Tier 2 engine using ultra clean 15 ppmw sulfur fuel, the emergency diesel fire pump engine will not generate visible emissions in excess of the limits of this rule.

Rule 402—Nuisance: Under normal operation, the facility will not emit significant quantities of odorous or visible substances; therefore, the facility will comply with this regulation.

Rule 403—Fugitive Dust: Establishes requirements to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources. The site

will implement best available control measures to minimize fugitive dust emissions so that they do not result in visible dust emissions beyond the property line.

Rule 404—Particulate Matter—Concentration: This rule does not apply to emissions resulting from the combustion of liquid or gaseous fuels in steam generators or gas turbines.

Rule 405—Particulate Matter—Weight: Because natural gas will be used as a fuel, the equipment is expected to comply with the applicable limits in this rule.

Rule 407—Liquid and Gaseous Air Contaminants: Emissions from the VPP will be well under 500 ppmv CO. In addition, the site is exempt from the SO_x provisions of this rule because natural gas is used as a fuel.

Rule 409—Combustion Contaminants: The facility will comply with the standards in Rule 409 through the use of natural gas as a fuel.

Rule 431.1—Sulfur Content of Gaseous Fuels: The site will use natural gas that complies with Rule 431.1.

Rule 431.2—Sulfur Content of Liquid Fuels: The site will use diesel fuel that complies with the 15 ppmvd fuel sulfur limit of this rule. Fuel meeting the 15 ppmvd limit is commonly available in the South Coast Air Basin.

Rule 475—Electric Power Generating Equipment: Establishes limits for combustion contaminant (i.e., PM) emissions from subject equipment. Rule 475 prohibits PM emissions that exceed both 11 lbs/hr (per emission unit) and 0.01 gr/dscf at 3 percent O_2. During operation of the turbines, PM_{10} emissions will exceed the 11 lb/hr limit, but will not exceed the 0.01 gr/dscf at 3 percent O_2 limit.

Rule 476—Steam Generating Equipment: Because the site will be a NO_x RECLAIM facility, the NO_x requirements for this rule do not apply. Therefore, only the PM provisions of this rule will apply. The turbines PM_{10} emissions will exceed the 11 lb/hr limit. Additionally, the highest concentration of particulate matter expected is 0.0017 grains per standard dry cubic foot of exhaust gas[5], which is below the particulate matter limit of 0.1 grains per standard cubic foot of exhaust gas.

Rule 53A—Specific Contaminants: The equipment used onsite will burn natural gas and, therefore, will comply with the SO_2 and PM limits from Rule 53A.

Rule 1110.2—Emissions from Stationary Internal Combustion Engines: Establishes limits for emission of NO_x, VOC, and CO from the stationary internal combustion reciprocating engines. Emergency standby engines that operate less than 200 hours per year are exempt from this regulation Rule 1110.2(h)(2). Additionally, RECLAIM exempts IC engines from the NO_x provisions in this rule.

Rule 1146—Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters: Because the site will be a NO_x RECLAIM facility, the NO_x requirements for this rule do not apply. The auxiliary boiler will be electrically heated. Additionally, boilers used exclusively for generating electricity and

[5] Based on 12 lb/hr PM_{10} emissions, 1,123,466 acfm exhaust flow, 197°F temperature, and 9.28 percent exhaust gas moisture content.

waste heat boilers located downstream of gas turbines are specifically not included in the rule applicability (Rule 1146(a)(3) and (b)(1)). This rule does not apply.

Rule 1404—Hexavalent Chromium Emissions from Cooling Towers: No hexavalent chromium will be used in cooling towers.

Rule 1470—Requirements for Stationary Diesel Fueled Internal Combustion and Other Compression Ignition Engines: Establishes fuel and emissions requirements of diesel engines. As of January 1, 2006, all engines need to use CARB Diesel Fuel or an alternative diesel fuel that meets the requirements of the Verification Procedure. The rule sets forth the PM emission limits of 0.15 gram per horsepower hour (g/hp-hr) for new standby engines, and limits the operation time of non-emergency use of the engine. The project will use diesel fuel with a fuel sulfur content of 15 ppmvd in accordance with Rule 431.2 and Rule 1470. Additionally, a Tier 2 engine that meets the 0.15 gr/bhp-hr limit of Rule 1470 will be used.

8.1.7 Cumulative Air Quality Impacts Analysis

An analysis of potential cumulative air quality impacts that may result from the project and other reasonably foreseeable projects is generally required only when project impacts are significant.

The Applicant received a listing of potential cumulative impact sources from the SCAQMD that have submitted permit applications to the SCAQMD or those that have received permits but are not yet in operation. The Applicant transmitted this listing to the CEC for review. The CEC identified those sources it believed were appropriate to include in the cumulative impact analysis. The Applicant reviewed these sources with the SCAQMD permit engineer identified and provided additional information to the CEC staff. The resulting list of potential cumulative impact sources is presented in Appendix 8.1F, which includes a description of the permitting actions. Furthermore, the California Energy Commission staff reviewed the CEQA projects identified by the SCAQMD staff and discounted these projects because of the distance from the VPP project and the emission sources are not appropriate for modeling (volatile organic compound sources). Additionally, a review of the City of Vernon, Los Angeles, and the County of Los Angeles planning departments did not identify any Notices of Preparation for projects that would be expected to emit significant operational emissions (refineries, power plants, engine generators, etc.).

The Applicant has acquired the necessary information on the sources identified by the CEC as appropriate for including the cumulative air quality impact analysis and will be submitting the results of the analysis to the CEC by the end of March.

8.1.8 Mitigation

Mitigation will be provided for all emission increases from the project in the form of offsets and the installation of BACT, as required under SCAQMD regulations. Through the use of BACT/LAER to control air pollutant emissions, the acquisition of ERCs/RTCs, combined with the results of the air quality impact analysis, the project is not expected to result in significant air quality impacts, and the Applicant believes that no additional operational mitigation is necessary beyond the offsets that will be provided in accordance with SCAQMD requirements. Appendix 8.1F presents the proposed mitigation for the project.

The Applicant proposes to implement the standard construction mitigation measures developed by the CEC over the past few years to mitigation construction air quality impacts expected during construction.

8.1.9 References

California Air Resources Board (CARB). http://www.arb.ca.gov/adam

CARB Recommended Interim Risk Management Policy for Inhalation-based Residential Cancer Risk (CARB 2003).

CARB. 1989. Reference Document for California Statewide Modeling Guideline. April.

Bennett, M., M. Yansura, I. Hornyik, J. Nall, D. Caniparoli, and C. Ashmore. 2002. Evaluation of the CALPUFF Long-range Transport Screening Technique by Comparison to Refined CALPUFF Results for Several Power Plants in Both the Eastern and Western United States. Proceedings of the Air & Waste Management Association's 95th Annual Conference, June 23-27. Baltimore, MD. Paper #43454.

Keith, Ralph W., 1980. A Climatological Air Quality Profile California South Coast Air Basin, delivered at the American Meteorological Society 60th Annual Meeting, Los Angeles, CA. January.

Officials of the National Oceanic and Atmospheric Administration U.S. Department of Commerce (NOAA), 1974. Climates of the States in Two Volumes, Vol. II including Alaska and Hawaii, A Practical Reference Containing Basic Climatological Data of the United States. Water Information Center, Inc., 1974.

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Ventura County Air Pollution Control District. 2001. AB 2588 Combustion Emission Factors. May 17.

U.S. Environmental Protection Agency (USEPA). Compilation of Emission Factors. AP-42.

USEPA. 1999. Guideline on Air Quality Models, 40 CFR, Part 51, Appendix W. July 1.

USEPA. 1995. On-Site Meteorological Program Guidance for Regulatory Model Applications, USEPA-450/4-87-013. August.

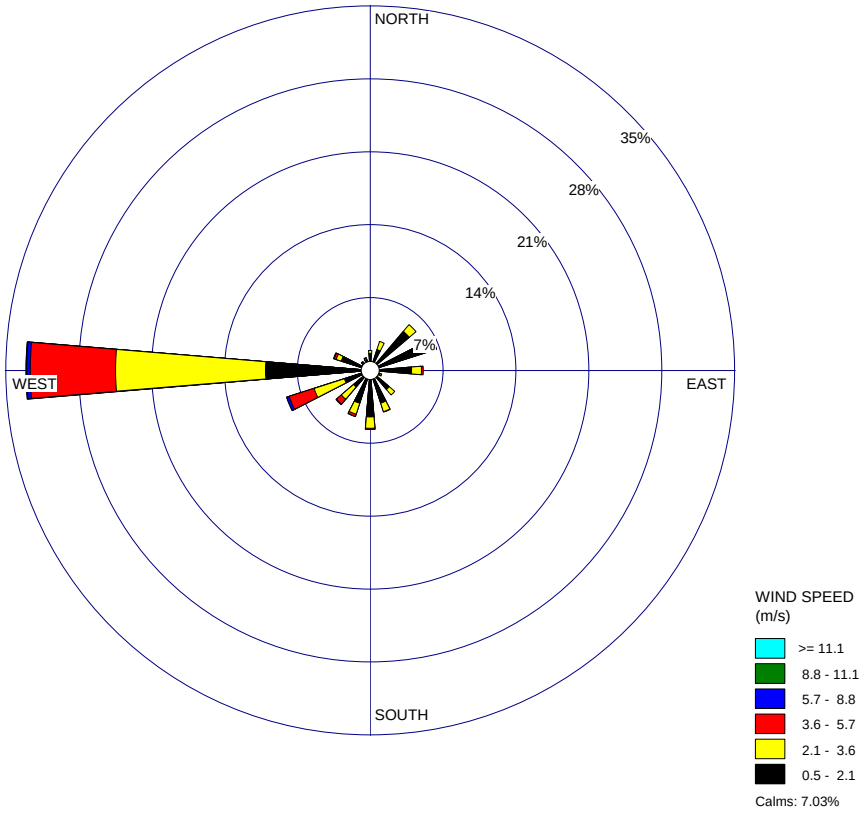
USEPA. 1992. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised, USEPA-454/R-92-019. October.

USEPA. 1987. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), USEPA-450/4-87-007. May.

USEPA. 1985. Guideline for Determination of Good Engineering Practice Stack Height. June.

USEPA. http://www.epa.gov/airs

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - Annual Windrose Jan.1 - Dec. 31 - 00:00 - 23:00	Wind Speed Direction (blowing from)



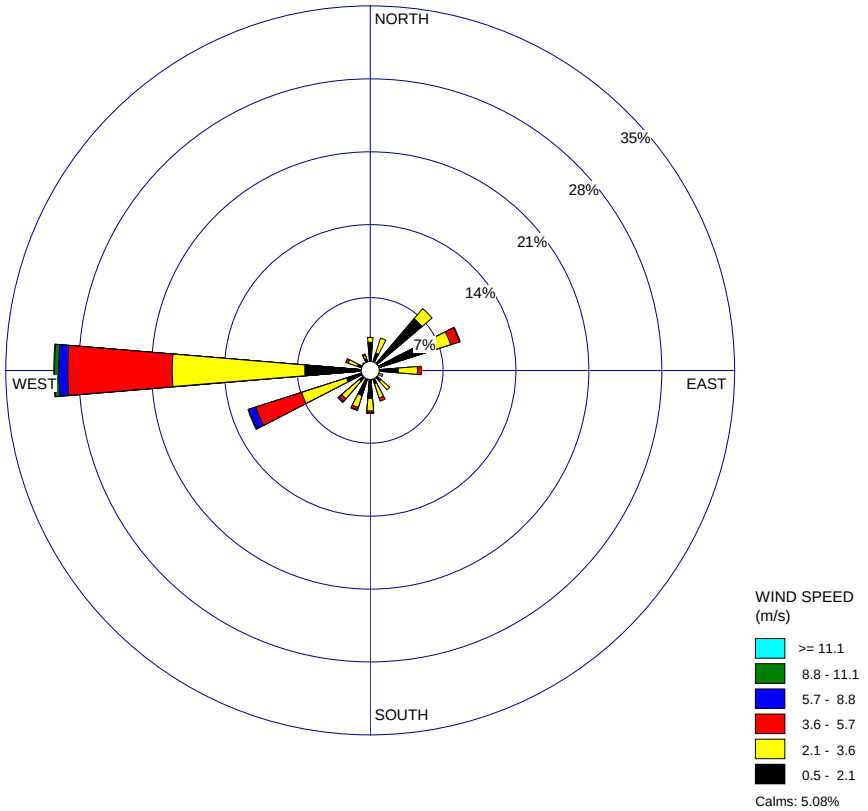
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Jan 1 - Dec 31 00:00 - 23:00	CH2M HILL	
		MODELER:	
	CALM WINDS: 7.03%	TOTAL COUNT: 8760 hrs.	
	AVG. WIND SPEED: 2.10 m/s	DATE: 11/3/2005	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1a
ANNUAL WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_22 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - A.M. Winter Windrose Jan.1 - Mar. 31 - 7:00 - 20:00	Wind Speed Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Jan 1 - Mar 31 07:00 - 20:00	CH2M HILL	
		MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	5.08%	1260 hrs.	
	AVG. WIND SPEED:	DATE:	PROJECT NO.:
	2.50 m/s	11/3/2005	

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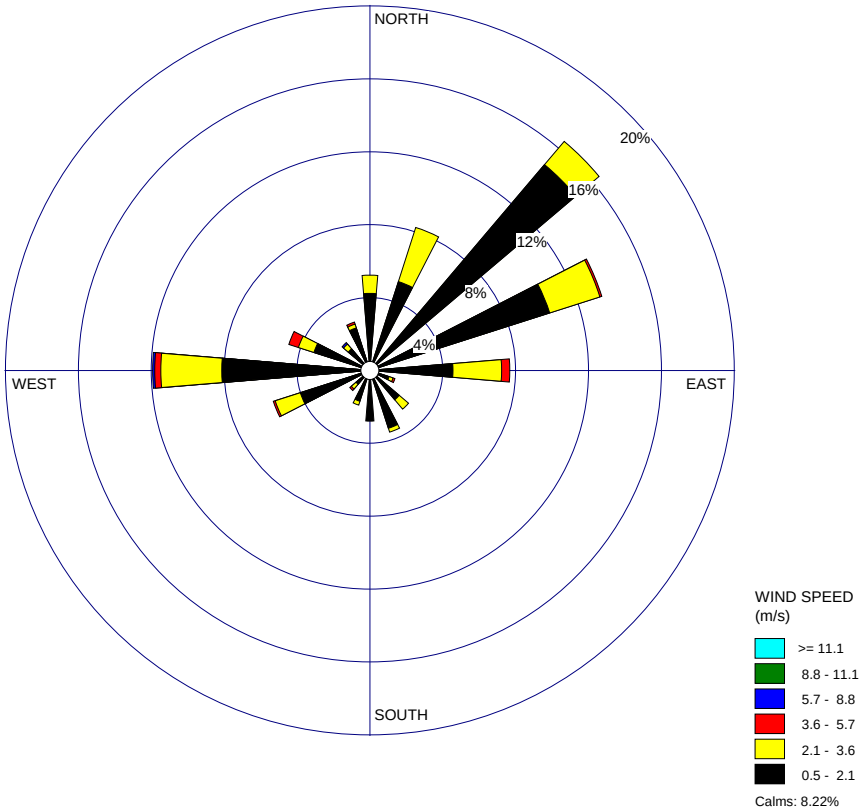
FIGURE 8.1-1b
WINTER WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_23 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - P.M. Winter Windrose Jan.1 - Mar. 31 - 21:00 - 6:00	Wind Speed Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Jan 1 - Mar 31 00:00 - 23:00	CH2M HILL	
		MODELER:	
	CALM WINDS: 8.22%	TOTAL COUNT: 900 hrs.	
	AVG. WIND SPEED: 1.53 m/s	DATE: 11/3/2005	PROJECT NO.:

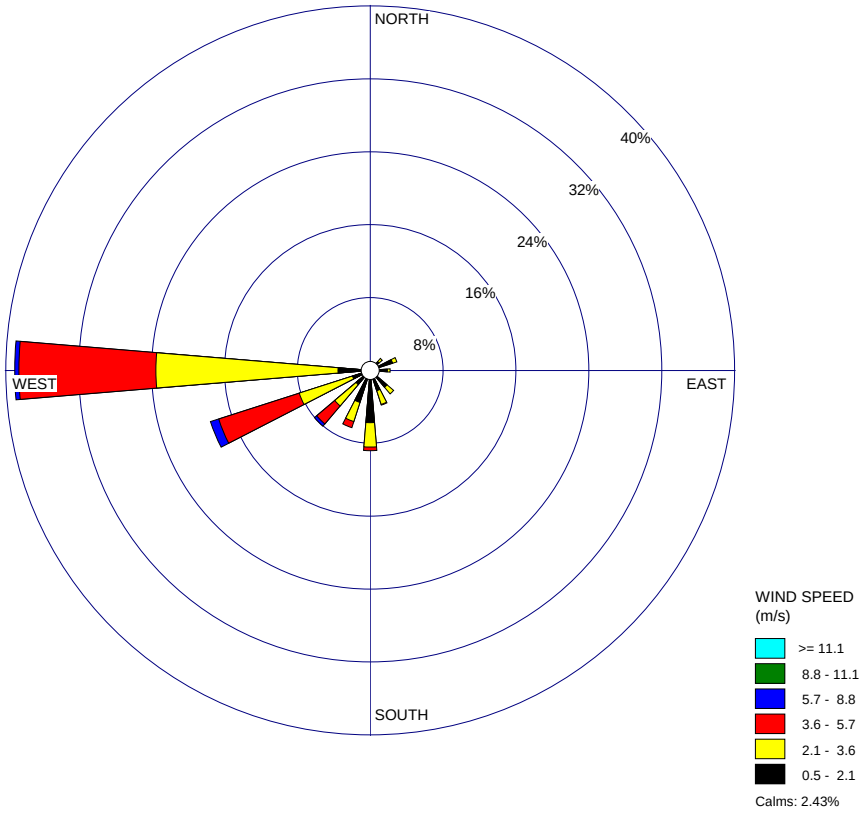
WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1c
WINTER NIGHTTIME WINDROSE
CITY OF VERNON
METEOROLOGICAL STATION
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA

CH2MHILL

D102005001RDD_24 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - A.M. Spring Windrose Apr.1 - Jun. 30 - 7:00 - 20:00	Wind Speed Direction (blowing from)



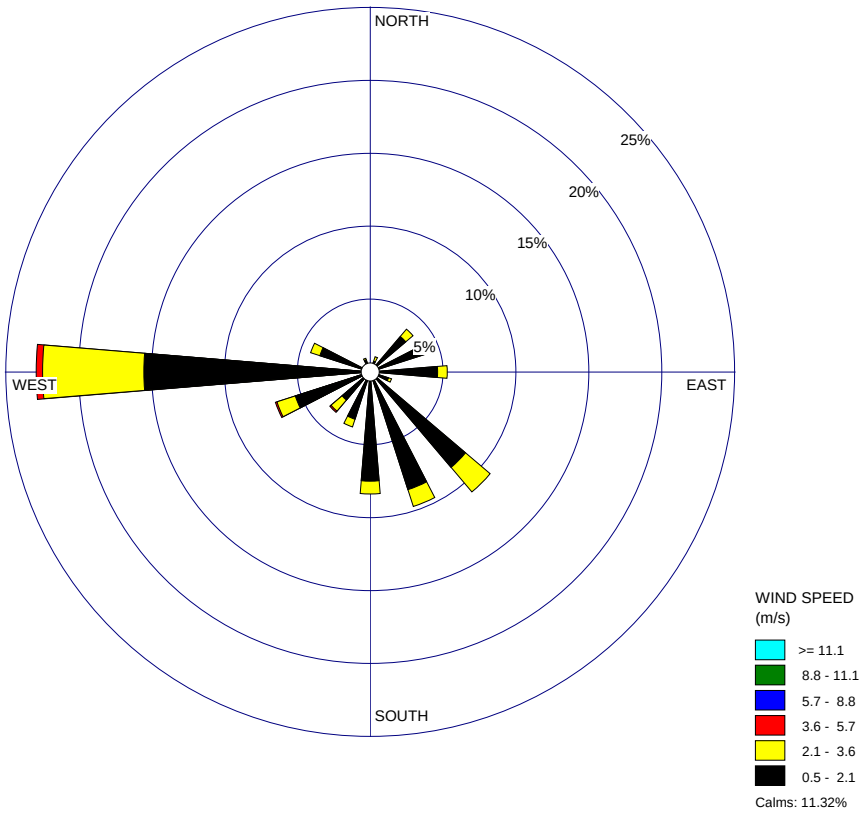
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Apr 1 - Jun 30 07:00 - 20:00	CH2M HILL	
		MODELER:	
	CALM WINDS: 2.43%	TOTAL COUNT: 1274 hrs.	
	AVG. WIND SPEED: 2.92 m/s	DATE: 11/3/2005	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1d
SPRING WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_25 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - P.M. Spring Windrose Apr.1 - Jun. 31 - 21:00 - 6:00	Wind Speed Direction (blowing from)



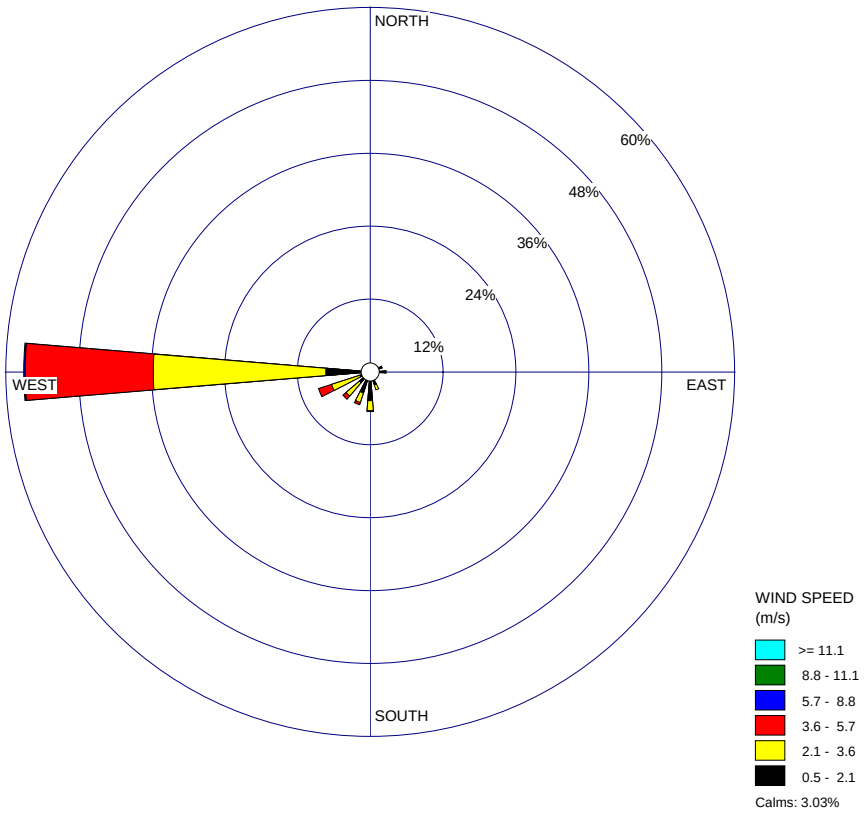
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Apr 1 - Jun 30 00:00 - 23:00	CH2M HILL	
		MODELER:	
	CALM WINDS: 11.32%	TOTAL COUNT: 910 hrs.	
	AVG. WIND SPEED: 1.39 m/s	DATE: 11/3/2005	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1e
SPRING WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_26 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - A.M. Summer Windrose Jul.1 - Sep. 30 - 7:00 - 20:00	Wind Speed Direction (blowing from)



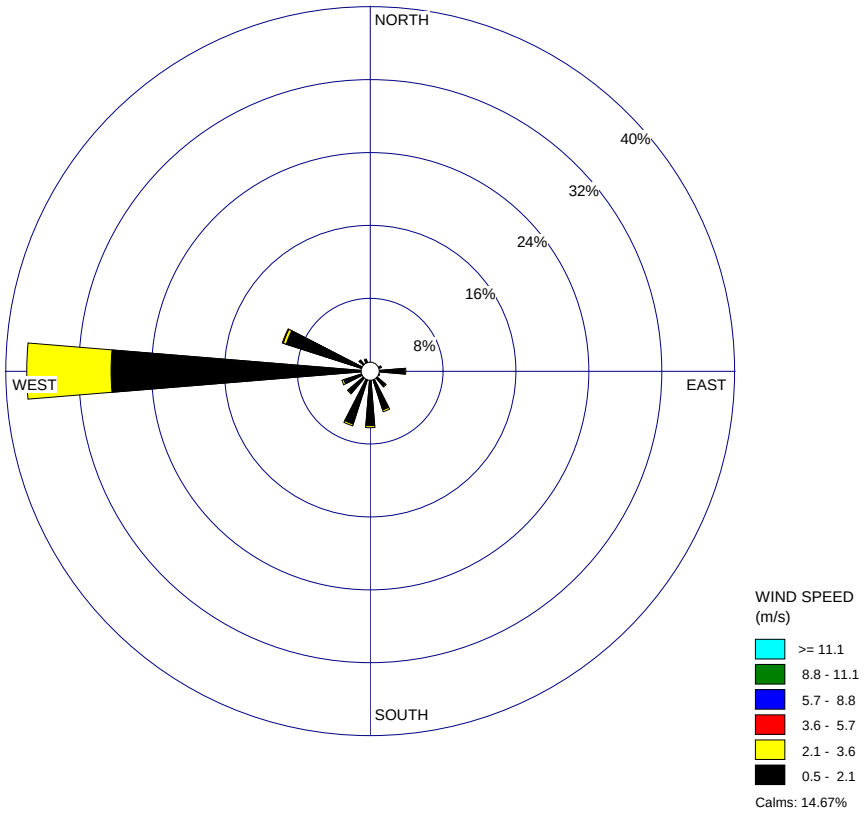
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Jul 1 - Sep 30 07:00 - 20:00	CH2M HILL	
		MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	3.03%	1288 hrs.	
	AVG. WIND SPEED:	DATE:	PROJECT NO.:
	2.75 m/s	11/3/2005	

WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1f
SUMMER WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_27 ((2/15/06))

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - P.M. Summer Windrose Jul.1 - Sep. 30 - 21:00 - 6:00	Wind Speed Direction (blowing from)



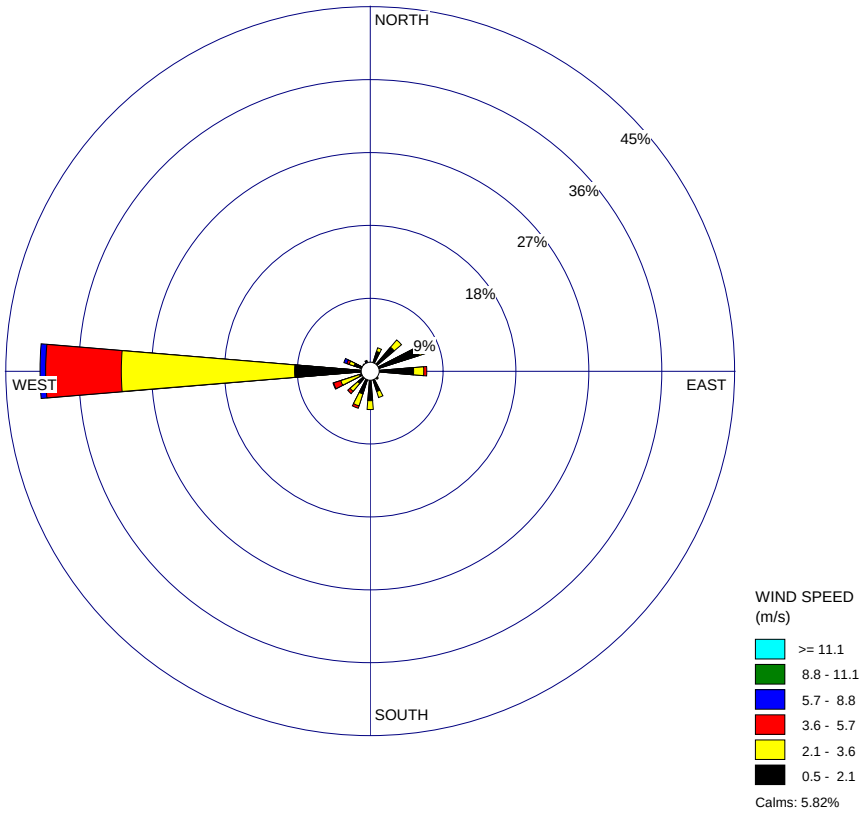
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Jul 1 - Sep 30 00:00 - 23:00	CH2M HILL	
		MODELER:	
	CALM WINDS: 14.67%	TOTAL COUNT: 920 hrs.	
	AVG. WIND SPEED: 1.23 m/s	DATE: 11/3/2005	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1g
SUMMER WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_28 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - A.M. Autumn Windrose Oct.1 - Dec. 31 - 7:00 - 20:00	Wind Speed Direction (blowing from)



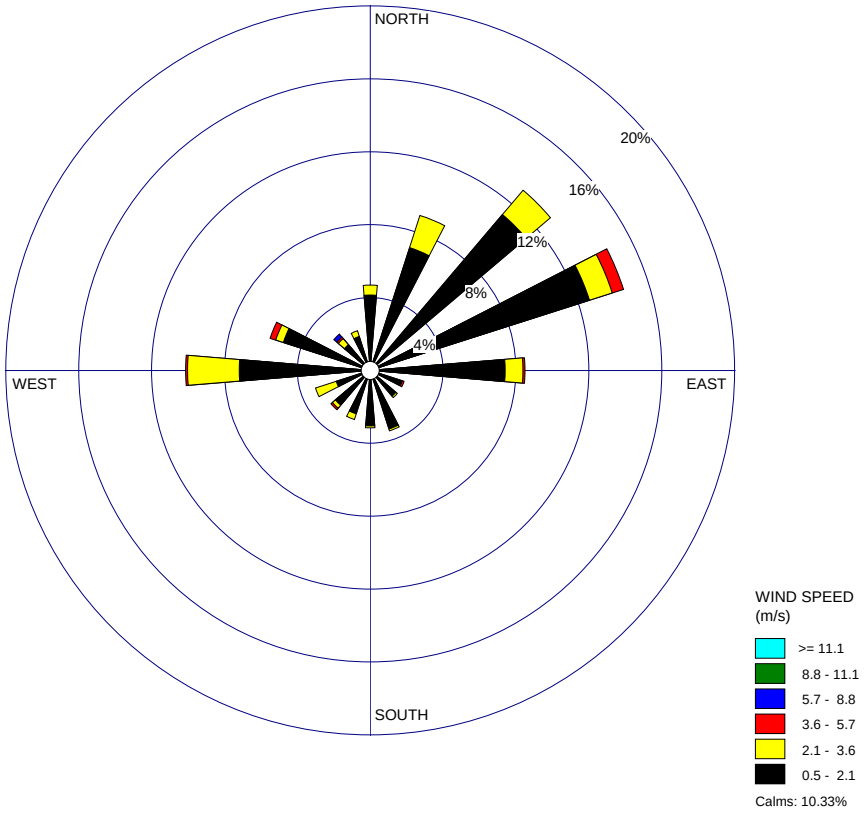
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Oct 1 - Dec 31 07:00 - 20:00	CH2M HILL	
		MODELER:	
	CALM WINDS: 5.82%	TOTAL COUNT: 1288 hrs.	
	AVG. WIND SPEED: 2.27 m/s	DATE: 11/3/2005	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

FIGURE 8.1-1h
AUTUMN WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_29 (2/15/06)

WIND ROSE PLOT:	DISPLAY:
Vernon Power Plan 1981 - P.M. Autumn Windrose Oct.1 - Dec. 31 - 21:00 - 6:00	Wind Speed Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1981 Oct 1 - Dec 31 00:00 - 23:00	CH2M HILL	
		MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	10.33%	920 hrs.	
	AVG. WIND SPEED:	DATE:	PROJECT NO.:
	1.38 m/s	11/3/2005	

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FIGURE 8.1-1i
AUTUMN WINDROSE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA
CH2MHILL

D102005001RDD_30 (2/15/06)

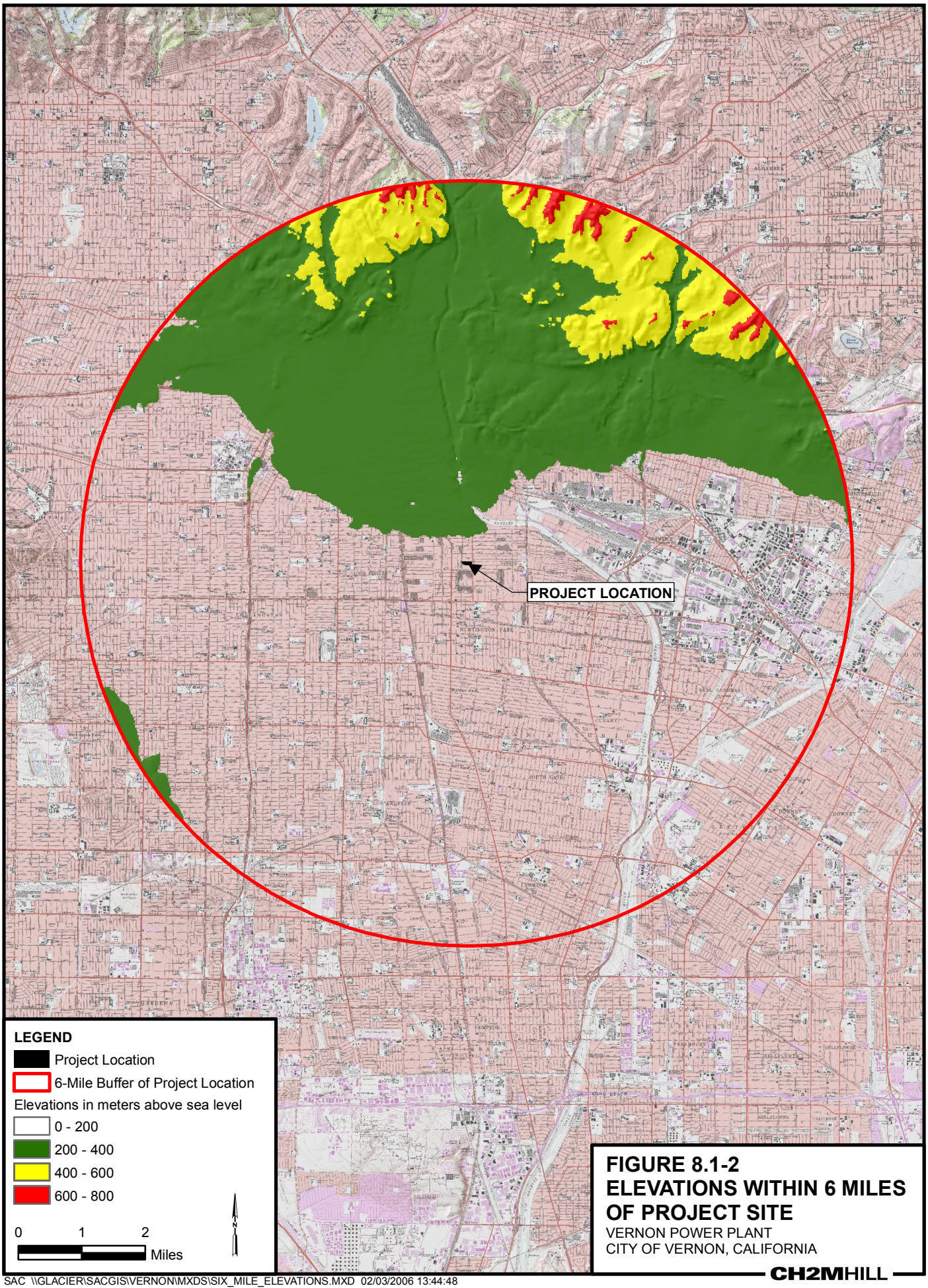

FIGURE 8.1-2
ELEVATIONS WITHIN 6 MILES OF PROJECT SITE
VERNON POWER PLANT
CITY OF VERNON, CALIFORNIA

CH2MHILL

SAC \\GLACIER\SACGIS\VERNON\MXDS\SIX_MILE_ELEVATIONS.MXD 02/03/2006 13:44:48