State Of California The Resources Agency of California

Memorandum

Date: August 17, 2001
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To: Arthur Rosenfeld, Presiding Member
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From: **California Energy Commission**
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Jack W. Caswell, Project Manager

Subject: **VALERO COGENERATION PROJECT AMENDMENTS TO THE STAFF ASSESSMENT**

Attached are amendments to 11 technical sections of the Staff Assessment (SA). These 11 amended technical sections are a result of additional information gathered at the SA workshop and information provided by city, county, state agencies, intervenors, and members of the public. Commission staff has docketed this information and is prepared to discuss the Staff Assessment and these amendments at the Commissions Evidentiary Hearing scheduled on August 20, 2001, in Benicia, California.

Attachments

cc: Proof of Service List
San Francisco RWQCB
Bay Area Air Quality Management District
Cal/Trans

VALERO COGENERATION PROJECT
Amendments to the Staff Assessment

(01-AFC-5)

Table of Contents

SUMMARY OF AMENDED SECTIONS

This table indicates the page and technical section in the staff assessment where language corrections and technical changes have occurred:

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ALL	Air Quality	4.6-1, 3, 7, 8, 12, 13	Noise
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Note: The following amended Staff Assessment sections may have significant technical changes and conclusions when compared to the original SA. The selected text in this document is intended to replace the corresponding information in the Staff Assessment filed on August 2, 2001, except where noted otherwise.

EXECUTIVE SUMMARY

ENVIRONMENTAL AND ENGINEERING CHECK LIST

Page 1-3, Check list

The Traffic & Transportation check list box should be marked as less than significant with mitigation.

SPECIAL FINDINGS REGARDING FOUR-MONTH REVIEW

Page 1-4

Public Resources Code section 25552 establishes a four-month review process for qualifying power projects. That process was applied to the Valero Cogeneration Project. Section 25552 sets forth several requirements for approval of a Certification, which we address by proposing the following findings for adoption by the Energy Commission. Each proposed finding is followed by evidence or references to evidence supporting the finding.

Special Finding 1: The proposed powerplant, by itself, is not a major stationary source but is a modification to a major stationary source—the refinery as a whole. It will be equipped with best available control technology (BACT) for all pollutants. Public Resources Code Section 25552(d)(1) requires that, in order to qualify for approval under the Commission's 4-month review process, a powerplant be neither a major stationary source nor a modification to a major stationary source and that BACT be used for all pollutants. Although the proposed powerplant does not fully satisfy those requirements, the Energy Commission finds it necessary and appropriate to suspend the requirement of that subsection that the proposed powerplant not be a modification of a major stationary source in order to approve it under the 4-month process. The project will benefit the residents of California by providing additional electrical power in a time of great need for additional generating capacity. Suspension of the subsection's restriction is authorized by Governor's Executive Order D-26-01.
Required by: Section 25552(d)(1)
Supporting Evidence: The Air Quality section of this Staff Analysis indicates that the project is not a major stationary source in itself but is a minor modification of a major stationary source—the refinery as a whole. Under the Governor's Emergency Order D-26-01 the Energy Commission is authorized to suspend restrictions in Section 25552 "to the extent that they would prevent, hinder, or delay the prompt mitigation of the effects of [California's energy] emergency." The additional electricity generating capacity provided by the proposed project will clearly help mitigate the emergency and it is appropriate to relax the requirement of Section 25552(d)(1) that the powerplant cannot be a modification of a major stationary source.

AIR QUALITY

NOTE:
This Air Quality Amended section replaces the SA Air Quality section in its entirety.

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed LM6000 combustion turbine units at the Valero Cogeneration Project (VCP). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), precursor organic compounds (POC) and particulate matter less than 10 microns in diameter (PM10).

In carrying out this analysis, the California Energy Commission staff evaluated the following major points:

whether the combustion turbine generators (CTGs) at the VCP are likely to conform with applicable Federal, State and Bay Area Air Quality Management District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);

whether the CTGs at the VCP are likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and

whether the mitigation proposed for the CTGs at the VCP are adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR and PSD analyses have been delegated by the United States Environmental Protection Agency (EPA) to the Bay Area Air Quality Management District (District). The PSD requirements do not apply to this project, as the project's net emissions

increases are below the thresholds,[1] and the project is not a new major source, or a major modification to an existing major source. Instead, it is a minor modification to an existing major source.

STATE

The California State Health and Safety Code, section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

The proposed project is subject to the Bay Area Air Quality Management District (District) rules and regulations. The rules and regulations are discussed in the Preliminary Determination of Compliance (PDOC) issued July 27, 2001 (District 2001). Rules that apply to the Project are summarized below. The rules and the project's compliance with them are described more fully in the PDOC. The project must also comply with the City of Benicia General Plan and specific air quality policies embodied therein.

Regulation 2

Rule 1 - General Requirements. This rule contains general requirements, definitions, and a requirement that an applicant submit an application for an authority to construct and permit to operate.

Rule 2 - New Source Review. This rule applies to all new and modified sources. The following sections of Rule 2 are the regulations that are applicable to this project.

- Section 2-2-301 - Best Available Control Technology (BACT) Requirement: This rule requires that BACT be applied for each pollutant which is emitted in excess of 10.0 pounds per day.
- Section 2-2-302 - Offset Requirement, Precursor Organic Compounds and Nitrogen Oxides. This section applies to projects with an emissions increase of 50 tons per year or more of organic compounds and/or NO_x. Offsets shall be provided at a ratio of 1.15 tons of emission reduction credits for each 1.0 ton of proposed project permitted emissions.
- Section 2-2-303 - Offset Requirements, Particulate Matter (TSP), PM10 and Sulfur Dioxide: If a Major Facility (a project that emits any pollutant greater than 100 tons per year) has a cumulative increase of 1.0 ton per year of PM10 or SO_2, emission offsets must be provided for the entire cumulative increase at a ratio of 1.0:1.0.

[1] Major sources are those that exceed 100 tons per year for any pollutant. Major modifications of major sources are those that result in net increases 40 tons per year (tpy) of NOx, SO2 and POC, 100 tpy of CO, or 15 tpy of PM10.

Emission reductions of nitrogen oxides and/or sulfur dioxide may be used to offset increased emissions of PM10 at offset ratios deemed appropriate by the Air Pollution Control Officer.

A facility that emits less than 100 tons of any pollutant may voluntarily provide emission offsets for all, or any portion, of their PM10 or sulfur dioxide emissions increase at the offset ratio required above (1.0:1.0).

- Section 2-2-606 - Emission Calculation Procedures, Offsets. This section requires that emission offsets must be provided from the District's Emissions Bank, and/or from contemporaneous actual emission reductions.

Rule 7-Acid Rain. This rule applies the requirements of Title IV of the federal Clean Air Act, which are spelled out in Title 40, Code of Federal Regulations, section 72. The provisions of Section 72 will apply when EPA approves the District's Title IV program, which has not been approved at this time. The Title IV requirements will include the installation of continuous emission monitors to monitor acid deposition precursor pollutants.

Regulation 6

Regulation 6 - Particulate Matter and Visible Emission. The purpose of this regulation is to limit the quantity of particulate matter in the atmosphere. The following two sections of Regulation 6 are directly applicable to this project:

- Section 301 - Ringelmann No. 1 Limitation: This rule limits visible emissions to no darker than Ringelmann No. 1 for periods greater than three minutes in any hour.
- Section 310 - Particulate Weight Limitation: This rule limits source particulate matter emissions to no greater than 0.15 grains per standard dry cubic foot.

Regulation 9

Rule 1 - Limitations

- Section 301: Limitations on Ground Level Sulfur Dioxide Concentration. This section requires that emissions of sulfur dioxide shall not impact at ground level in excess of 0.5 ppm for 3 consecutive minutes, or 0.25 ppm averaged over 60 minutes, or 0.05 ppm averaged over 24 hours.
- Section 302: General Emission Limitation. This rule limits the sulfur dioxide concentration from an exhaust stack to no greater than 300 ppm dry.

Rule 9 - Nitrogen Oxides from Stationary Gas Turbines. This rule limits gaseous fired, SCR equipped, combustion turbines rated greater than 10 MW to 9 ppm@15%O2.

Regulation 10

Rule 26 - Gas Turbines - Standards of Performance for New Stationary Sources. This rule adopts the national maximum emission limits (40 C.F.R. §60) which are 75 ppm NO_x and 150 ppm SO_2 at 15 percent O_2. Whenever any source is subject to more than one emission limitation rule, regulation, provision or requirement relating to the control of any air contaminant, the most stringent limitation applies.

City of Benicia General Plan

The City of Benicia General Plan supports improved regional air quality (Goal 4.10) through the implementation of the Bay Area Clean Air Plan (Policy 4.10.1) and by requiring projects to include all feasible mitigation needed to reduce significant air quality impacts to a level of insignificance (Program 4.10.B). Additionally, one of the performance standards of Zoning Ordinance Section 17.70.240 requires that all uses shall comply with rules, regulations, and standards of the air District.

SETTING

CLIMATOLOGY

The VCP, if approved, would be located at the Valero refinery near Benicia, California. The project area is characterized by prevailing strong winds from the west, particularly during the summer, fall and winter. Sometimes during spring, a weak westerly flow (flow from the east) develops causing elevated pollutant levels in the Bay Area. During these periods the Bay Area, in general, is affected by low wind speeds and shallow mixing depths, thereby allowing the build up of pollution levels.

Along with the winds, another climatic factor is atmospheric stability and mixing height. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually fewer direct[2] air quality impacts from a single air pollution source like the VCP. During the winter months between storms, very stable atmospheric conditions can occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts can result from stationary and mobile source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing

Pacific Gas and Electric (PG&E) collects meteorological data in Pittsburg, California. The data collected or subsequently estimated by PG&E includes wind direction, wind speed, temperature, and atmospheric stability class. The measured wind data are graphically represented as quarterly and annual wind roses in Appendix A. The data collection monitor is located approximately ten miles east (downwind) from the proposed project. The District has deemed the data collected by this monitor as representative of the area's meteorology, and that it is appropriate to use for air dispersion modeling analyses for this project.

[2] Direct impacts refer to those impacts from air pollutants in the plume. Ozone is not directly emitted from a power plant.

AMBIENT AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the federal Environmental Protection Agency (USEPA). The state and federal air quality standards are listed in Air Quality Table 1. As indicated in Air Quality Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 and $\mu g/m^3$).

AIR QUALITY: Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	1 Hour	0.12 ppm (235 $\mu g/m^3$)	0.09 ppm (180 $\mu g/m^3$)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	—
	1 Hour	—	0.25 ppm (470 $\mu g/m^3$)
Sulfur Dioxide (SO_2)	Annual Average	80 $\mu g/m^3$ (0.03 ppm)	—
	24 Hour	365 $\mu g/m^3$ (0.14 ppm)	0.04 ppm (105 $\mu g/m^3$)
	3 Hour	1300 $\mu g/m^3$ (0.5 ppm)	—
	1 Hour	—	0.25 ppm (655 g/m^3)
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	—	30 $\mu g/m^3$
	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Annual Arithmetic Mean	50 $\mu g/m^3$	—
Sulfates (SO_4)	24 Hour	—	25 $\mu g/m^3$
Lead	30 Day Average	—	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 $\mu g/m^3$)
Vinyl Chloride (chloroethene)	24 Hour	—	0.010 ppm (26 $\mu g/m^3$)
Visibility Reducing Particulates	1 Observation	—	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.

In general, an area is designated as attainment for a specific pollutant if the measured concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be

attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

The VCP is located near the Carquinez Strait, which is the link between the San Francisco Bay and the Sacramento Delta. The area is under the jurisdiction of the Bay Area Air Quality Management District. The District collects ambient air quality data at monitoring sites throughout the air basin. The data is used to determine attainment status and define air quality trends. The area designations are shown in Air Quality Table 2. The area is designated attainment for the state's CO, NO2, SO2, SO4 and lead standards, and attainment for the federal SO2 standard, and unclassified/attainment for the federal PM10 and CO standards. The area is non-attainment of the state and federal 1-hour ozone standards and the state 24-hour PM10 standard (ARB 2001).

AIR QUALITY: Table 2
Federal and State Attainment Status for Bay Area Air District

Pollutant	Attainment Status*	
	Federal	**State**
Ozone	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Attainment	Nonattainment
Lead	Attainment	Unclassified

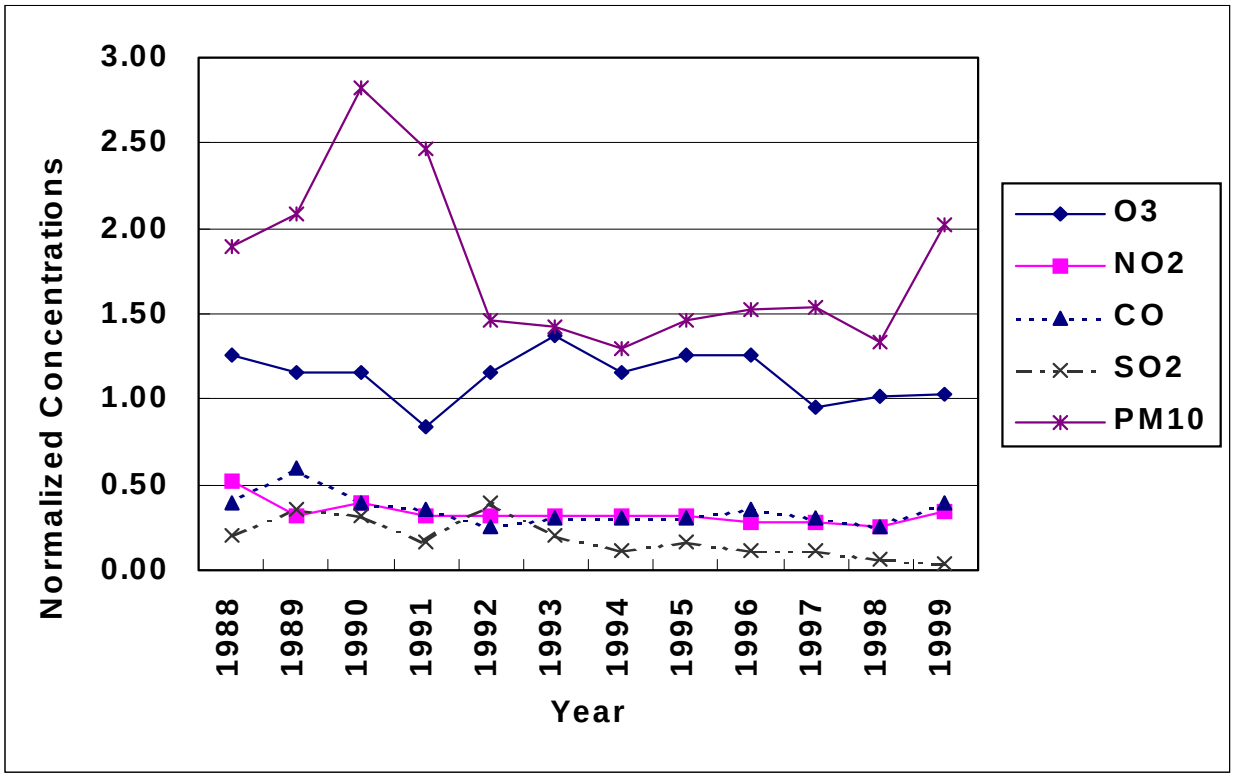
Source: BAAQMD Website (www.baaqmd.gov)

AIR QUALITY Figure 1 summarizes the historical air quality data for the project location for particulate matter less than 10 microns (PM10), CO, SO_2, O_3, and NO_2. In AIR QUALITY Figure 1, the normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most stringent ambient air quality standard. Because PM10 concentration data in the Antioch area are available for only 12 months, from August 1999 to September 2000, staff has used the PM10 concentrations collected at the nearest monitoring stations, which are located at Bethel Island and Vallejo.

Ozone

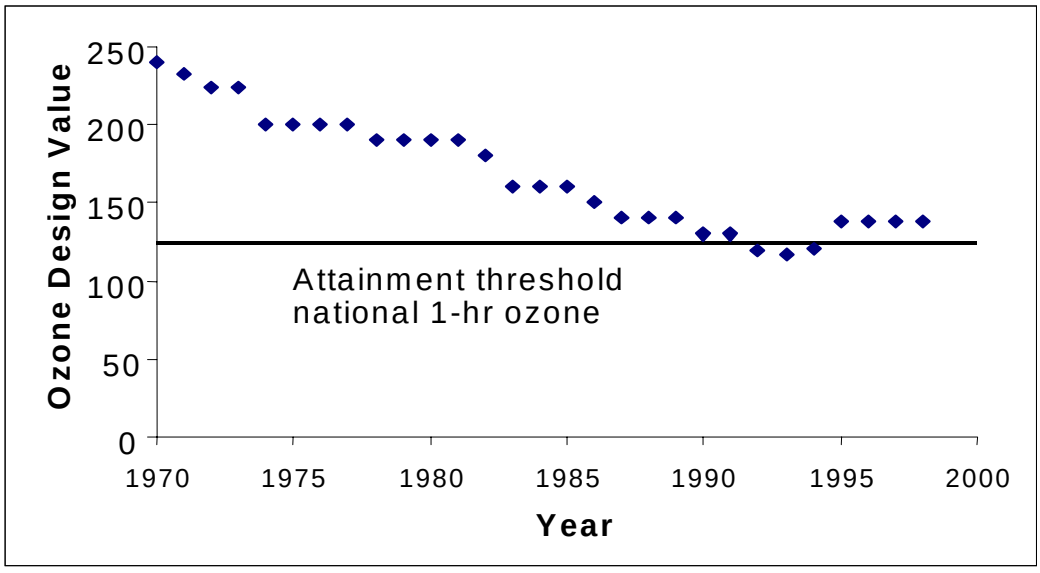
In the past 8 years, the area has experienced an average of four or five days per year with violations of the 1-hour state ambient air quality standard for ozone, and less frequent violations of the federal 1-hour ozone standard. Ozone formation is influenced significantly by year-to-year changes in atmospheric conditions. For this reason, a long-term trend in ambient ozone levels is needed to understand if a region is experiencing reductions in its ambient ozone concentrations or not. As shown in AIR QUALITY Figure 2, the long-term statistics of ozone levels in the San Francisco Bay Area region shows that this region has made a steady stride toward attainment of the federal 1-hour ozone standard.

AIR QUALITY Figure 1 Normalized Maximum Short-Term Historical Air Pollutant Concentrations: 1988-1999



A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1997 the highest 24-hour average PM10 concentration measured in Bethel Island was 77 μg/m^3. Since the most stringent ambient air quality standard is 50 μg/m^3, the 1997 normalized concentration is 77/50 = 1.54. Source: ARB.

AIR QUALITY Figure 2 - District Ozone Design Value 1970-1998



Each design value represents the fourth highest concentration recorded in the air basin during the previous three years. Design values are used to determine attainment status.

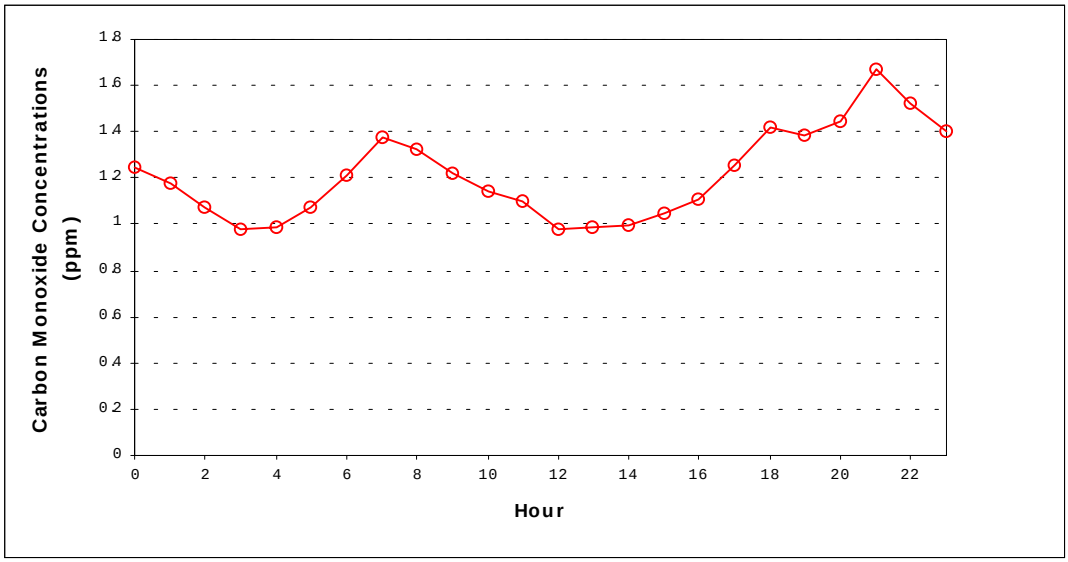
Source: BAAQMD

The exact reasons for the recent violations of the federal ozone standard shown in AIR QUALITY Figure 2 are not known. The District developed its 1997 State Implementation Plan (SIP) to identify a strategy to bring the air basin back to attainment of the federal 1-hour ozone standard (BAAQMD, 1997). The District will conduct additional studies in the future to better understand the ozone problem in the Bay Area air basin and surrounding air basins. The study results will be used to develop an equitable and effective air quality management strategy to reach attainment of federal air quality standards.

Carbon Monoxide (CO)

The highest CO concentration levels measured in Vallejo, Pittsburg and Antioch are at least 50 percent lower than the most stringent California ambient air quality standards (see AIR QUALITY Figure 1). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since the mobile sector (cars, trucks, and buses) is the main source of CO, we expect ambient concentrations of CO to be highly dependent on emissions from the mobile sector. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. In Antioch, CO concentrations may also peak late in the evening, as shown in AIR QUALITY Figure 3. This is probably the result of CO emissions from wood burning in residential fireplaces in Antioch and/or adjacent areas.

AIR QUALITY Figure 3
Average Diurnal CO Profile
Antioch, January 1 - 15, 1996

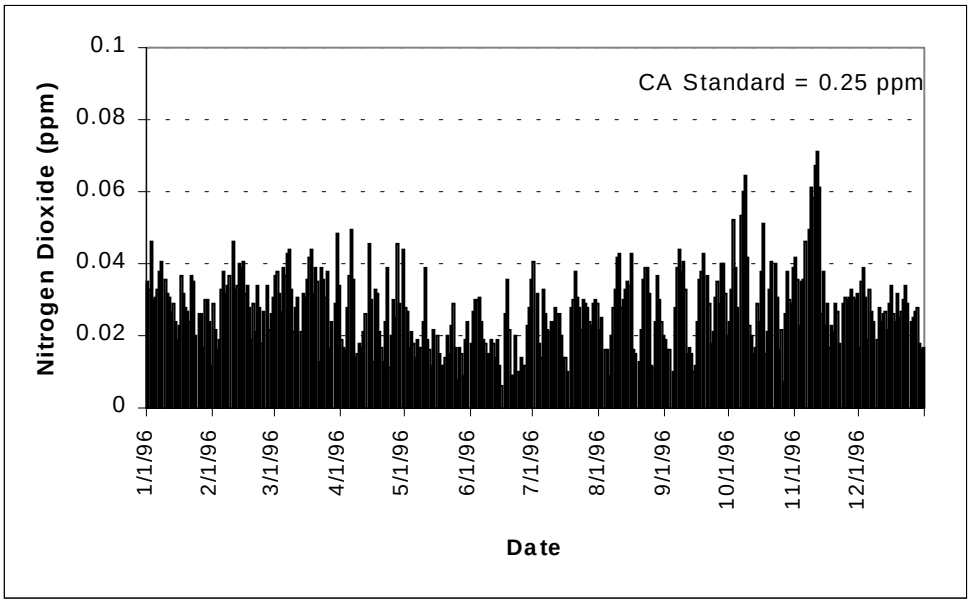


Source: ARB

Nitrogen Dioxide (NO_2)

NO_2 levels in Vallejo are no more than one-third of the most stringent NO_2 ambient air quality standards, as shown in AIR QUALITY Figure 1. Approximately 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO_2. NO is oxidized in the atmosphere to NO_2, but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 occur during the fall (see AIR QUALITY Figure 4 for a typical annual average) and not in the winter when atmospheric conditions favor the trapping of ground level releases but lack significant photochemical activity (less sun light). In the summer the conversion rates of NO to NO_2 are high but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard.

AIR QUALITY Figure 4
Maximum Daily 1-hour average NO_2 Concentrations measured in 1996: Typical of the Bay Area (Pittsburg Station)



Source: ARB,1998a

Particulate Matter (PM)

As shown in AIR QUALITY Figure 1, PM10 concentrations measured at the Vallejo and Bethel Island monitoring stations show a declining trend in the last ten years. The same trend has been observed at other sites at Contra Costa County. The highest PM10 concentrations are measured in the winter. During wintertime high PM10 episodes, the contribution of ground level releases to ambient PM10 concentrations is disproportionately high. For example, wood smoke contributes approximately 47 percent of the PM10 mass in San Jose, while the contribution at Pittsburg may be on the order of 30 percent (Chow et al. 1995). The contribution of wood smoke particles to the PM2.5 concentrations may be even higher, considering that most of the wood smoke particles are smaller than 2.5 microns.

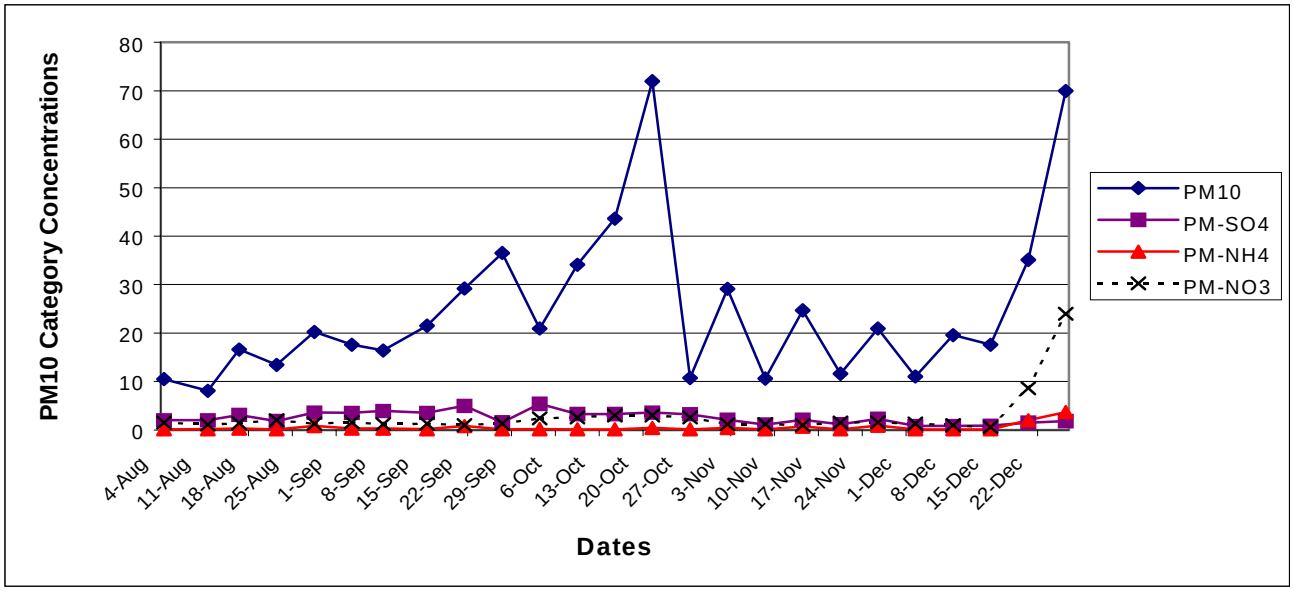
Nitrates and Sulfates

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NO_x emissions from combustion sources. AIR QUALITY Figure 5 shows that the nitrate ion concentrations during the winter time are a significant portion of the total PM10 and could be an even higher contributor to particulate matter of less than 2.5 microns (PM2.5).

PM sulfate (mainly ammonium sulfate) is formed in the atmosphere from the oxidation of SO_2 and subsequent neutralization by ammonia in the atmosphere. The oxidation of SO_2 depends on many factors, which includes: the availability of hydroxyl (OH), hydroperoxy (HO_2) and Methylperoxy (CH_3OH), and humidity. AIR QUALITY Figure 5 shows that the sulfate portion can range from 5 to 25 percent of the total PM10 measured.

AIR QUALITY Figure 5 also shows that one of the annual highest PM10 measurement happened on December 26, 1999, a Sunday after a major holiday. This limited data indicated that the highest PM10 concentration measured in the Antioch area might not be the result of industrial activities. Staff suspects that motor vehicles, domestic activities during the holiday, and perhaps limited air movement during this period might have caused such a spike of PM10.

AIR QUALITY Figure 5
PM10 Portions of Sulfates, Nitrates and Ammonium
Measured at Pittsburg Monitoring Station in 1999 (ARB)



Source: ARB

Ambient Ozone

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NOx) and hydrocarbons (Precusor Organic Compounds [POCs]) interact in the presence of sunlight to form ozone. The reaction can take several hours

to occur, so ozone generally forms downwind and/or lags the timing of the emissions peaks.

In 1997, the US EPA proposed a new 8-hour ozone standard of 0.08 ppm, in addition to the federal 1-hour standard of 0.12 ppm. Legal challenges have placed the new standard in the federal courts. Pending appeals, the current federal 1-hour ozone standard remains in place and 8-hour ozone data is being collected and reported. The region is non-attainment of the 1-hour standard, and will probably be non-attainment of the proposed 8-hour standard.

The US EPA remains convinced that there is not a disconnect between controls for the 1-hour standard and the more stringent 8-hour standard. Whatever progress is made now toward attaining, or maintaining, the 1-hour federal standard will only speed attainment of the potentially more protective 8-hour standard since planning for the 8-hour standard does not have to be completed until 2003 and attainment not reached until 2005 at the earliest.

Air Emissions Implications of new Generation

Calpine and Florida Power and Light have built, or are planning the construction and operation of, new generation capacity the Bay Area and in the Delta region of the Bay Area. The new generation will use clean-burning natural gas, and potential emission increases for most pollutants will be offset by emission reductions. Additionally, FPL will be implementing District Rule 9-11 by installing SCR at most of the existing boiler units at the Pittsburg, Potrero, and Contra Costa power plants, reducing permitted NOx emission rates by up to 90 percent. Bay Area generation emissions for most air pollutants will be decreasing and/or are offset by emission reductions. It is expected that generation emission will become a smaller percent of overall pollutant inventories in the local region and the Bay Area.

PROJECT DESCRIPTION

PROPOSED EQUIPMENT

The proposed VCP consists of two phases. Phase 1 will install a General Electric LM 6000 combustion turbine with water injection for NOx control and a fired heat recovery steam generator (HRSG), which generates steam for the refinery. The Phase 1 CTG/HRSG use a wet cooling tower to reject heat from equipment . VCP Phase 2 will install a General Electric LM 6000 combustion turbine with water injection for NOx control and a fired heat recovery steam generators (HRSG), which will also generate steam for the refinery. Both the CTGs and the fired-HRSGs will use refinery gas as the primary fuel, with natural gas as the backup or supplemental fuel.

CONSTRUCTION

The construction of the new combustion turbine power plant will include the following ancillary facilities and activities, either in series or parallel with the construction activities associated with the combustion turbines and HRSGs:

Preparation of construction laydown and parking areas;

Pipelines for refinery and natural gas; and

Construction of underground transmission lines.

The combustion turbine power plant will take approximately 15 months to construct. The Phase 1 and Phase 2 power plant project construction itself consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection will occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves.

Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and are relatively small emissions generating activities in comparison to the early construction activities. Not surprisingly, the largest level of construction emissions for the project will occur from the project site activity, most of it due to earth moving and grading activities and large crane operations. The construction of facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions generated from the construction equipment and vehicles.

OPERATIONAL PHASE

EQUIPMENT OPERATION

The new CTGs will burn refinery gas, a by-product of the refined product processes at the Valero refinery. The refinery gas energy density is approximately 30 percent greater than natural gas, but it contains more sulfur than pipeline quality natural gas. Natural gas will be an alternative back-up fuel. Both CTG units are expected to operate continuously, or 8760 hours per year.

EMISSION CONTROLS

The exclusive use of a gaseous fuel will limit the formation PM10 emissions compared to liquid and solid fuels. The refinery gas will be scrubbed to remove sulfur, however, sulfur compounds in the fuel will be greater than natural gas. To minimize NOx emissions during the combustion process, the turbine is equipped with the low-NOx combustors. Additionally, water is injected into the combustor cans of the CTG to control NOx. After combustion in the CTG, the flue gases pass through the heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. Valero is proposing to use Selective Catalytic Reduction (SCR) to reduce NOx and a CO oxidation catalyst to reduce CO and VOC. A

more complete discussion of these control technologies is included in the Mitigation section.

The cooling tower will be equipped with a high efficiency drift eliminator to control PM_{10} emissions. The drift eliminator will control the drift fraction to 0.005%.

ESTIMATED PROJECT EMISSIONS

CTG and project representative criteria air pollutant 1-hour emissions are shown in Air Quality Table 2. Emissions rates can vary with ambient temperatures and fuel use. The higher emissions shown in Table 2 are from the combustion turbine during startup compared to emissions during steady state, full load operation. Most notably, emissions of NOx and CO are significantly higher during startup. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation, not start-up.

Air Quality Table 2
Worst Case Project Emissions (hourly, daily and annual)

Operational Profile	NOx	SO2	PM10	POC	CO
Hourly : 1 turbine start-up (lbs/hr) [a]	38.12	10.96	3.14	0.68	60
1 x CTG @ 100% w/duct firing (lbs/hr)	7.29	17.82	2.49	2.037	17.82
2 x CTG @ 100% w/duct firing (lbs/hr)	14.58	35.64	4.98	4.074	35.64
Cooling tower PM10 (lbs/hour)	---	---	0.151	---	---
Daily: 2 CTGs w / one start-up each and steady state operation (lbs/day)	411.58	263.0	38.79	47.96 [b]	422.33
Cooling tower PM10 (lbs/day)	---	---	2.624	---	---
Annual: 2 CTGs @ steady state operation (tons per year) [c]	57.207	43.822	13.606	16.912 [b]	139.694
Cooling tower PM10 (tons per year)	---	---	0.661	---	---

a. These start up values were used in the air dispersion modeling and are different than those identified in the District DOC.

b. The daily and annual POC numbers include fugitive emissions from the collection and distribution of the refinery gas.

c. Based on 8 start-ups per year and an average firing rate for the CTGs and duct-firing. See District DOC (District 2001).

Source: District 2001

During startup and shutdown, combustion temperatures and pressures are rapidly changing, which results in less efficient combustion and higher emissions. Also, the flue gas controls, such as the catalyst discussed above, operate most efficiently when the turbine operates near or at full load, at which the catalysts are at or near design temperatures. Those flue gas controls are not as effective during the transitory temperature changes that occur during startup and shutdown.

The worst-case hourly and daily emissions from the project are shown in Air Quality Table 2. The table includes start-ups and different operating scenarios, and the resultant emissions. Annual emissions are also summarized in the Air Quality Table 2. Cooling tower PM10 emissions, shown in Table 2, occur as water is released from the tower as drift. The drift contains total dissolved solids (TDS), which become airborne as the water evaporates. Cooling tower PM10 emissions are minimized by limiting drift (0.005%), and by limiting TDS in the cooling water to 1080 ppm TDS.

Ammonia Emissions

Combustion turbines using SCR to control NOx emissions inject ammonia into the flue gas stream. Not all of this ammonia reacts in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted, un-reacted, out the stacks. These ammonia emissions are known as ammonia slip. The District has limited the VCP to an ammonia slip no greater than 10 ppm. This level is usually associated with the degradation of the SCR catalyst, generally in a time frame of five years or more after initial operation. At that point, the SCR catalysts are removed and replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of 1 to 2 ppm.

Initial Commissioning Phase Operation and Emissions

The combustion turbines will undergo an initial firing and commissioning. It should be noted that it is in the owner's best interest to minimize this initial commissioning phase in order for the project to be declared ready for commercial operation and thus able to generate revenues. Therefore, it is expected that this initial commissioning phase will, to the extent feasible, be as short as possible and thus minimize the higher than normal operations emissions that are inevitable during the necessary testing. The District's PDOC contains conditions of certification outlining emission limits for the project during the commissioning phase.

IMPACTS

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
AIR QUALITY – Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d. Expose sensitive receptors to substantial pollutant concentrations?		X		
e. Create objectionable odors affecting a substantial number of people?			X	

IMPACTS

MODELING APPROACH

The applicant performed an air dispersion modeling analysis to evaluate the project's potential impacts on the existing ambient air pollutant levels, both during construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually occur in the area. The impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour-by-hour meteorological data collected in the vicinity of the project site is used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model was used for the screening and refined modeling.

CONSTRUCTION IMPACTS

Valero did not performed air dispersion modeling analyses of the potential construction impacts at the project site. However, both the applicant and the Energy Commission staff agreed that any construction impacts would be mitigated to the extent feasible by "boiler plate" construction conditions of certification. The boiler plate construction conditions of certification were derived for larger and longer construction projects and will be very conservative.

Although construction of the VCP and ancillary facilities will result in unavoidable short-term impacts, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because of the project's rather isolated location in the center of an industrial facility. Nevertheless, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the CO, PM10 and NO2 ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for combustion turbine steady-state operations, and the transitory conditions during turbine start-up and the special meteorological conditions associated with fumigation. The analysis assumes worst-case ambient temperatures during steady state operation to predict the highest impacts possible. Other operating configurations and ambient temperatures were analyzed to determine the maximum 3-hour, 8-hour, 24-hour and annual scenarios, including turbine start-ups.

Valero provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during start-up conditions. The start-up emissions for NOx and CO are generally higher since the combustion turbine and downstream components, including the catalyst systems, are not at design (elevated) temperatures. This results in less complete combustion (i.e., increased CO emissions) and relatively uncontrolled NOx emissions. The modeling assumes these higher emission rates with stack parameters for turbine operation at 50 percent load. The low load conditions can cause higher impacts since the flue gas temperature and velocity are relatively low, resulting in less plume rise away from the facility.

The applicant modeled the cooling tower and potential PM10 emissions. The modeling results of for the cooling tower impacts are not split out from the project (i.e., the CTG stacks) impacts. However, past experience and the relative size and emission rates of the cooling tower suggest that any impacts will be on the same order as the impacts from the CTG stacks plumes.

Fumigation Modeling

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes. Because of the short duration of fumigation events, only 1 to 8-hour impacts are calculated. The modeling results for are shown in Air Quality 3.

Air Quality Table 3

Fumigation Modeling Maximum Impacts

Pollutant	Averaging Time	Maximum Fumigation Modeled Concentrations (µg/m3)
NO2	1-hour	18.1
	Annual	---
CO	1-hour	28.5
	8-hour	6.0
SO2	1-hour	8.3
	3-hour	7.5

Project Impacts

Valero provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during normal steady state operation and during start-up conditions. The results of these modeling analyses are summarized in Air Quality Table 4. This modeling analysis reflected the use of the Ambient Ratio Method (ARM) to provide a more refined estimate of annual NO2 impacts.

The project does not cause any violations of ambient air quality standards. In most cases, the project's impacts plus background are considerably less than the standards. However, The project's PM10 impacts could contribute to existing violations of the state 24-hour PM10 standards. These impacts, or contributions, from VCP directly emitted PM10 emissions could be significant if left unmitigated.

Secondary Pollutant Impacts

The project's emissions of gaseous emissions, primarily NOx, SO2 and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM10, particularly ammonium nitrate PM10 and sulfate. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the VCP do have the potential (if left unmitigated) to contribute in some unquantified way to higher ozone levels in the region.

Concerning secondary PM10 (primarily ammonium nitrate) formation, the process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there is not an agency (EPA or CARB) recommended model or procedure for estimating nitrate or sulfate formation. Staff believes that the emissions of NOx, SOx and VOC from VCP do have the potential (if left unmitigated) to contribute, to higher secondary PM10 (particularly of ammonium nitrate) levels in the region.

Air Quality Table 4

Combustion Turbine and Cooling Tower Refined Modeling Maximum Impacts

Pollutant	Averaging Time	Impact ($\mu g/m^3$) [a]	Back-Ground ($\mu g/m^3$) [c]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	1-hour	156.3	158.8	315.1	470	67
	Annual [b]	0.14	34.4	34.5	100	35
CO	1-hour	246.0	---	---	23,000	---
	8-hour	27.4	6,394	6,421	10,000	64
SO2	1-hour	61.6	---	---	655	---
	3-hour	38.1	---	---	1,300	---
	241-hour	6.49	31.9	38.4	105	37
	Annual [c]	0.13	5.3	5.4	80	7
PM10	24-hour	2.82	85	87.82	50	176
	Annual [c]	0.13	18	18.13	30	60

a. The worst-case emissions/impacts from Air Quality Tables 2 and 3.
b. Using the ARM default value of 0.75.
c. Background PM10, NO2, and CO data was collected between 1998 and 2000 at the Concord or Vallejo ambient air monitoring station.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future impacts as part of the project impacts analysis, the applicant performed a cumulative modeling analysis. The cumulative analysis included potential and/or permitted, but not yet operating, projects located up to six miles from the proposed facility site. The applicant worked with the District to identify potential and/or permitted projects of size that might interact with the Valero project plumes and impacts. None were identified, so additional analysis and cumulative modeling were not conducted.

PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The PSD increment analysis is not required, per district rules.

VISIBILITY IMPACTS

A visibility analysis is not required, per district rules.

APPLICANT'S PROPOSED MITIGATION

Construction Mitigation

Valero has agreed to staff proposed control measures to limit fugitive dust during the construction phase of a project. These include the use of chemical stabilizing agents and dust suppressants or gravel areas on site, and the wetting or covering of stored earth materials on site. These proposed measures also require that the transporting of borrow fill dirt material be wetted, covered, or that sufficient freeboard be allowed. They also require the use of paved access aprons, gravel strips, wheel washing or other means to limit mud or dirt carryout onto paved public roads.

To minimize combustion emissions such as NOx, CO and PM10, Valero has agreed to the staff proposed control measures that require that contractors properly maintain vehicle/equipment engines to control exhaust emissions. In order to address potential PM10 and NO2 emissions in equipment exhaust, staff is also proposing that the diesel fuel be limited to no greater than 15 ppm sulfur to achieve further reductions in PM10 and PM10 precursors from construction equipment exhaust. The current California standard for diesel fuel limits sulfur to 500 ppm. California on-road diesel averages 130 ppm sulfur, with some fuel distribution terminals selling 50 ppm or less (i.e., 15 ppm) sulfur diesel fuel.

The ARB predicted as much as a 25 percent reduction of directly emitted PM10 and an 80 percent reduction of SO2, a PM10 precursor, with the implementation of the 500 ppm sulfur diesel standard (ARB 1988). Staff believes that the use of 50 ppm sulfur diesel instead of 130 ppm diesel will reduce SO2 emissions by as much as 60 percent, and reduce PM10 between 5 percent (Clean 2000) and 10 percent. Reducing sulfur in diesel fuel helps extend engine life by reducing corrosive wear. Additionally, lower sulfur diesel ensures a greater compatibility with post-combustion catalysts and soot filters, where they are appropriate (ARB 1998). The use of 15 ppm S diesel will result in lower SO2 and PM10 compared to the use of on road diesel or 50 ppm S diesel fuel.

The oxidizing diesel particulate filter is a device that replaces the muffler of the construction equipment. It reduces CO and hydrocarbon (VOC) emissions by approximately 80-90% and PM10 emissions by approximately 90-99%. The Conditions of Certification will be written to give the on-site engineer the latitude to remove the oxidizing diesel particulate filters when it is determined that they are not appropriate for the specific construction activity or equipment application

Operations Mitigation

The VCP air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, Valero proposes to use low NOx combustors in the CTGs with water injection. In addition, each combustion turbine will use a SCR catalyst system to achieve a NOx concentration of 2.5 ppm, corrected to 15 percent oxygen averaged over a 3-hour

period, subject to source testing. The District has concluded that this is BACT for a combustion turbine using refinery gas. If the unit is fired exclusively with natural gas, the NOx permit limit is 2.5 ppm NOx, averaged over one hour.

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NOx concentrations entering the HRSG are 42 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 10 ppm at 100 percent load.

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, a catalyst system will be installed in the HRSGs. Valero is proposing the SCR/oxidation catalyst systems to reduce NOx, VOC, and CO emissions. SCR systems are generally ineffective during turbine start-up or when catalyst temperatures are lower than 600^{o}F.

The oxidation catalyst will control CO and VOC emissions to 10 ppm and 2 ppm, respectively. The District, subject to source testing considers these levels BACT. BACT is not triggered for PM10 or SO2. However, the PM10 emissions will be limited by the use of a clean burning gaseous fuel (refinery gas or natural gas) and the efficient combustion process of the CTGs. SO2 emissions will be limited by the removal of sulfur from the refinery gas to the lowest levels practicable. Currently, Valero uses an MEA scrubbing system.

Emission Offsets

District Regulation 2, Rule 2, Sections 302 requires that Valero provide emission offsets, in the form of emission reductions or banked Emission Reduction Credits (ERC), for the project's emissions increases of NOx, SOx, PM10 and POC. The offsets must be federally enforceable (i.e., meet federal requirements for offsets), provided on a tons per year basis. Additionally, if the offsets are provided as an interpollutant trade, the trade must be federally enforceable (i.e., meet federal requirements for offsets). The potential annual air emissions and offsets for the VCP Phase 1 are shown in Air Quality Table 5. The offsets are from contemporaneous emission reductions from the refinery (i.e., existing boiler shutdowns) and banked emission reduction credits. Additionally, Valero will curtail SO2 emissions throughout the refinery. The permitted SO2 emissions will not increase with the addition of the two combustion turbines and heat recovery steam generators.

VCP Phase 2 air emissions and offsets are shown in Table 6. Again, the emission reductions are from contemporaneous shutdowns and banked ERCs. For Phase 2, Valero will surrender POC ERCs to offset both NOx and POC. District rules allow the interpollutant trading of POC for NOx – both precursors to ozone and PM10. For SO2, Valero will operate under a SO2 group, or "bubble." SO2 emissions throughout the refinery, including the new cogeneration units, will be included in the annual SO2 emissions cap. The permitted SO2 emissions will not increase with the addition of the two combustion turbines and heat recovery steam generators. While the SO2

emissions from the new cogeneration units are potentially in the range 44 tons per year, the permitted SO2 emissions will only be on the order of 28.1 tons per year. The applicant has the option of operating under the SO2 cap, or increasing the SO cap by adding valid ERCs. For example, Valero will have approximately 3.873 tons per year of contemporaneous SO2 emission reduction credits from the boiler shut downs (S38, -39, and –41) that will probably be added to the cap at a later date. The fact the Phase I and Phase II are staggered should allow Valero to operate under the initial SO2 cap until more SO2 ERCs are added to the group.

Air Quality Table 5
VCP Phase 1 Emissions and Offsets (tons per year)

	Total Emissions	NOx	CO	POC	SO2	PM10
Phase I and II	CTG and HRSG	57.207	139.694	15.967	43.822	13.606
	Fugitives			0.945		
	Cooling Tower					0.661
	Total Emissions	57.207	139.694	16.912	43.822	14.267
Boiler shut down ERCs	S-38, -39, -41	-27.783	-141.61	-9.938	-3.873	-14.546
Emissions Liability	CTG and HRSG	29.424	N/A	6.574	39.949	-0.279
	Offset Ratio [a]	1.15	N/A	1.15	1.0	1.0
	Total ERCs needed	33.838	N/A	7.56	curtailment [b]	credit
ERC #703 [c]		31.418				
ERC #682 [d]		2.42		12.349		
Excess [e]		0.0	N/A	4.789	0.0	0.279

a. Per District rules.
b. Valero will curtail SO2 emissions throughout the refinery facility to net out of SO2 increases.
c. Valero will surrender ERC #703 having 31.418 tons per year NOx. Valero currently owns the ERC.
d. Valero will surrender ERC #682 having 14.769 tons per year POC. District rules allow POC to be used as NOx offsets at a ratio of 1 POC to 1 NOx. Valero currently owns the ERC.
e. Valero will receive banked credits from the District for the excess ERC surrendered.

Sources: District 2001

Staff Mitigation

District rules do not require permits for most cooling towers. However, staff considers the air pollutant emissions from cooling towers in their analysis. PM10 emissions from the cooling tower are 0.66 tons per year, which could contribute to existing violations of the state-24 hour standard and could be significant if not mitigated. Staff will require that 0.66 tons per year of PM10 ERCs be surrendered out of the 14.546 tpy PM10 credit available to Valero from the contemporaneous boiler shutdowns (S-38, -39, and –41)

ADEQUACY OF PROPOSED MITIGATION

Construction Mitigation

Valero will be required to comply with the proposed control measures for limiting fugitive dust emissions during construction. Additionally, Valero will require contractors to maintain their vehicles and equipment and that they adopt the Energy Commission construction conditions of certification to limit exhaust emissions of PM10. Staff and the applicant believe that these measures are necessary to mitigate, to the extent feasible, potential construction impacts.

Operations Mitigation

Emission Controls

Valero proposes to limit NOx emissions from the combustion turbines to 2.5 ppm at 15 percent O2 over a 3-hour rolling average, resulting from the use the use of a SCR and oxidation catalyst system. The NOx limit for the CTG/HRSG units, when fired on 100% natural gas, will be 2.5 ppm. Valero proposes VOC concentrations of less than 2.0 ppm at 15 percent O2 over a 1-hour rolling average, and CO concentrations of less than 10 ppm at 15 percent O2 over a 3-hour rolling average. Again, these emission rates result from the use of a SCR/ oxidation catalyst system. The NOx, CO PM10, SO2 and POC limits are considered BACT.

Offsets

Valero has identified a complete offset package that, on an annual basis, offsets the potential NOx, SO2, CO, PM10 and POC air emissions increases (District 2001) of the combustion turbines and heat recovery steam generators. Staff believes that these emission reductions mitigate any direct and indirect impacts of the project's combustion turbines and heat recovery steam generators emissions to a level of insignificance.

STAFF PROPOSED MITIGATION

Construction Mitigation

Staff proposes that prior to the commencement of construction, that Valero provide a fugitive dust maintenance plan that specifically spells out the mitigation measures that Valero will employ to limit fugitive dust during construction. It is anticipated that the fugitive dust measures be implemented for all construction activities at the project site and associated linear facilities such as transmission lines and gas pipelines.

Operation Mitigation

Staff proposes that Valero provide PM10 emission reductions to mitigate the potential impacts of the PM10 emissions from the cooling tower to a level of insignificance.

DISCUSSION OF CHECKLIST IMPACTS

a) Less than significant

The project emissions are fully mitigated and result in a net decrease in emissions from the Valero facility. The net emissions decreases are due to the RACT adjustments of the on-site contemporaneous reductions, which are part of the air quality plan. The project does not conflict with or obstruct the implementation of the applicable air quality plan. Therefore, the project's impacts are less than significant.

b) Less than significant with mitigation incorporated
The project emissions do not cause any new violations of ambient air quality standards. The project emissions will contribute to existing violations of the state and federal 1-hour ozone standards and the state 24-hour PM10 standard. However, the project's emissions will be fully offset, resulting in a net decrease in directly emitted PM10 and of PM10 and ozone precursor emissions. Therefore, the project's impacts are less than significant with mitigation incorporated.

c) Less than significant
The applicant performed a cumulative analysis of potential and/or permitted, but not yet operating, projects located up to six miles from the proposed facility site. None were identified, so additional analysis and cumulative modeling were not conducted. Therefore, the project's cumulative impacts are less than significant.

d) Less than significant with mitigation incorporated
The project emissions will contribute to existing violations of the state and federal 1-hour ozone standards and the state 24-hour PM10 standard, potentially exposing receptors to substantial pollutant concentrations. However, the project's emissions will be fully offset, resulting in a net decrease in directly emitted PM10 emissions and of PM10 and ozone precursor emissions. Therefore, the project's impacts are less than significant with mitigation incorporated.

e) Less than significant
No odor impacts are anticipated, since the facilities' gas turbine/HRSG SCR systems' ammonia slip will be limited to 10 ppmvd at the exhaust, which is below most published ammonia odor threshold values. The ambient ammonia concentrations, after dispersion, will be under the odor thresholds. No other significant emissions of odorous compounds will result from the gas turbine/HRSG, cooling tower, auxiliary boiler and emergency engine generator. Therefore, the project's odor impacts are less than significant.

ENVIRONMENTAL JUSTICE

The applicant has performed air dispersion modeling and air quality analyses for the Valero Cogeneration Project. Screening modeling determined the worst case[3] emissions for the project. Using the worst case emissions, refined modeling calculated the maximum air quality impacts for project start-up, operation, and shutdown. Based on the modeling results and Bay Area ambient air quality data, the project does not cause any violations of the state or federal ambient air quality standards.

[3] "Worst case" considers equipment (CTGs, duct burners, and cooling tower), load, fuel type, and ambient conditions.

PM10 emissions from the project will contribute to existing violations of the state 24-hour PM10 ambient air quality standards. However, the project impacts, including PM10, do not expose a minority population community to a greater impact than a non-minority population, and PM10 emissions are fully mitigated by offsets and emission reductions.

COMPLIANCE WITH LORS

FEDERAL

The District's NSR permit process, which generated the PDOC (District 2001) does not require a Prevention of Significant Deterioration (PSD) permit process for this project. The District is not doing a separate PSD permit review. The District will also issue a Title V permit for the facility upon operation of the project.

STATE

The project, with the issuance of a complete Preliminary Determination of Compliance by the Bay Area Air Quality Management District, appears to comply with Section 41700 of the California State Health and Safety Code.

LOCAL

The District issued a preliminary Determinations of Compliance (District 2001) August 15, 2001, with proposed conditions of certification, which are included below. The PDOC appears to satisfies one of the performance standards of the City of Benicia Zoning Ordinance Section 17.70.240, which requires that all uses shall comply with rules, regulations, and standards of the air District. Additionally, the PDOC and the staff analysis include all feasible mitigation needed to reduce significant air quality impacts to a level of insignificance, thereby complying with the Program 4.10.B of the city's General Plan. The project, through its net emission reductions, supports improved regional air quality (Goal 4.10) and the implementation of the Bay Area Clean Air Plan (Policy 4.10.1).

FACILITY CLOSURE

Eventually the VCP will close, either as a result of the end of its useful life (which is expected to be 30 years), or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur. If Valero were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how Valero plans to demonstrate compliance with District rules and fugitive dust and construction emissions control measures.

CONCLUSIONS AND RECOMMENDATIONS

The Valero Generating project is not a new major source or a major modification to an existing major source. The project uses BACT for NOx, CO, PM10, SO2, and POC. The project's air quality impacts from directly emitted PM10 and of the ozone precursor emissions of NOx and VOC and PM10 precursors of NOx, VOC and SO2 could be significant if left unmitigated. Valero will reduce operational emissions to the extent feasible, operate the facility under hourly, daily and annual emissions limits, and will provide NOx, SOx, PM10, and POC offsets well in excess of any potential air pollutant increases. Therefore, the project results in a net decrease of air pollutant emissions from the Valero refinery and any potential impacts are reduced to a level of insignificance.

Based on the District's Preliminary Determination of Compliance, staff believes that the project complies with the District's Rules and Regulations.

Therefore, staff recommends certification of the Valero Cogeneration project, contingent on completion and adoption of the District's DOC, and adoption of staff's proposed conditions of certification to reduce potential PM10 impacts from the cooling tower and potential impacts from on-site construction activities, to the extent feasible.

CONDITIONS OF CERTIFICATION

DETERMINATION OF COMPLIANCE CONDITIONS

Definitions:

1-hour period:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in Btu/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel, other than pilot gas, is flowing to a unit, measured in fifteen-minute increments.
MM Btu:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first 256 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 20(b) and 20(d).

Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 20(b) through 20(d) until termination of fuel flow to the Gas Turbine.
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For emission point P-60 (combined exhaust of S-1030 Gas Turbine and S-1031 HRSG duct burners) and emission point P-62 (combined exhaust of S-1032 Gas Turbine and S-1033 HRSG duct burners) the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation.

Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager

Conditions for the Approval of the Authority to Construct for the Valero Cogeneration Project - S-1030, S-1031, S-1032, S-1033:

Prior to the approval of the Authority to Construct S-1030, S-1031, S-1032 and S-1033, the owner will provide the following offsets: (Basis: NOx and POC Offsets)

NOx	31.418 TPY from Cert # 703
POC as NOx	2.42 TPY from Cert #682
POC	7.56 TPY from Cert #682

Verification: The project owner shall provide copies of the ERC to the District and the CEC CPM 30 days prior to the combustion of fuel in the gas turbines.

For SO2 emissions offsets, a curtailment group is established as follows: (Basis: SO2 offsets)

	Source	Base Line	
SG 1032	S-237	8.6 tpy	
F 4460	S-220	10.0 tpy	
MTBE Ships		9.5 tpy	
New Cogen	S-1030, 1031	N/A	App 2488
New Cogen	S-1032, 1033	N/A	App 2695
ERC's Deposited		0.0 tpy	Deposits applied as credits
Total		28.1 tpy	Not to be exceeded.

a. SO2 emissions from the Curtailment Group will not exceed 28.1 tpy for any consecutive four quarter period.

b. Emissions will be calculated using fuel flow meters and the TRS Gas Chromatograph CEM's data, or stack SO2 CEMS and flow data, or other District approved methods.

c. Owner can deposit any valid ERC certificate into the group as a credit, at any time.

d. A quarterly report of the group emissions will be submitted to the District, in a District approved format, to document compliance.

e. Sources may be added to or deleted from the group at Valero's request subject to District approval. This process will increase or decrease the total emission limit for the group by the source's base line amount, as calculated

per the District's ERC procedures found in Section 405 of Regulation 2, Rule 2.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. A quarterly report of the group emissions will be submitted to the District, in a District approved format, to document compliance. This report will be provided no later than 30 days after the end of the quarter

CONDITIONS FOR THE COMMISSIONING PERIOD - S-1030, S-1031, S-1032, S-1033:

The owner/operator of the proposed power plant (S-1030, S-1031, S-1032 and S-1033) shall minimize emissions of carbon monoxide and nitrogen oxides from these sources to the maximum extent possible during the commissioning period. Conditions AQ-3 through AQ-12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, the remaining conditions shall apply after the commissioning period has ended.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-1030 Gas Turbine combustors and S-1031 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-60/A-62 SCR System and A-61/A-63 CO Oxidation Catalyst System shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-1030, S-1031, S-1032, and S-1033.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Coincident with the as designed operation of A-60/62 SCR System, the Gas Turbines (S-1030 and S-1032) and the HRSGs (S-1031 and S-1033) shall comply with the NO_x and CO emission limitations specified in conditions AQ-18(a) through AQ-18(b).

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The owner/operator shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1030 and S-1032 Gas Turbine describing the procedures to be followed during the commissioning of the gas turbine and HRSG. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbine (S-1030 and S-1032) and HRSG (S-1031 and S-1033) without abatement by their respective SCR and CO Catalyst Systems.

Verification: The project owner shall submit a commissioning plan to the District and the CEC CPM at least four weeks prior to the first combustion of fuel in the CTG S-1030.

During the commissioning period, the owner/operator shall demonstrate compliance with conditions AQ-10 through AQ-12 through the use of properly operated, and maintained continuous emission monitors and data recorders for the following parameters:

- firing hours for the gas turbine and HRSG
- fuel flow rates through the train
- stack gas nitrogen oxide (and oxygen) emission concentrations at P-60/P-62
- stack gas carbon monoxide emission concentrations P-60/P-62
- stack gas SO2 emission concentrations at P-60/P-62 or fuel TRS/H2S concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbine (S-1030 and S-1032) and HRSG (S-1031 and S-1033). The owner/operator shall use District-approved methods to calculate heat input rates, NO_x mass emission rates, carbon monoxide mass emission rates, SOx mass emission rates, and emission concentrations of NO_x, SOx, and CO, summarized for each clock hour and each calendar day.

Verification: All records shall be retained on site for at least 5 years from the date of entry and made available to District, California Air Resources Board (CARB) and the Commission personnel upon request.

The District-approved continuous emission monitors specified in Air Quality Condition 8 shall be installed, calibrated, and operational prior to first firing of the Gas Turbine (S-1030 and S-1032) and Heat Recovery Steam Generator (S-1031 and

S-1033). After first firing of the turbine, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO, SOx, and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: The design details providing the type, specifications, and location of these monitors shall be submitted to the District for review and approval at least 30 prior to installation of the monitors.

The total number of firing hours of S-1030/S-1032 Gas Turbines and S-1031/S-1033 Heat Recovery Steam Generators without abatement of nitrogen oxide emissions by A-60/A-62 SCR System and/or A-61/A-63 Oxidation Catalyst System shall not exceed 500 hours during the commissioning period. Such operation of S-1030/S-1032 Gas Turbines and S-1031/S-1033 HRSGs without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 500 firing hours without abatement shall expire.

Verification: The project owner shall provide written notice to the District Permit Services and Enforcement Divisions no more than 5 days after the completion of these activities.

The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1030 and S-1032) and Heat Recovery Steam Generators (S-1031 and S-1033) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition AQ-22.

Verification: The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1030/S-1032) and Heat Recovery Steam Generators (S-1031/S-1033) during the commissioning period shall be included in the annual report specified in condition AQ-62.

Combined pollutant mass emissions from the Gas Turbine (S-1030 and S-1032) and Heat Recovery Steam Generators (S-1031 and S-1033) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1030, S-1031, S-1032, & S-1033).

NO_x (as NO_2)	360.34 pounds per calendar day
CO	855.36 pounds per calendar day
POC (as CH_4)	97.776 pounds per calendar day
PM10	124.72 pounds per calendar day
SO_2	524.88 pounds per calendar day

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Conditions for the Operation of Gas Turbines (S-1030 and S-1032) and the Heat Recovery Steam Generators (HRSG; S-1031 and S-1033)

The Gas Turbine (S-1030 and S-1032) and HRSG Duct Burners (S-1031 and S-1033) shall be fired on refinery fuel or natural gas. (Basis: BACT for SO_2 and PM_{10}).

Verification: Fuel use shall be included in the annual report required per AQ-22.

The combined heat input rate to the power train consisting of a Gas Turbine and its associated HRSG (S-1030 and S-1031 or S-1032 and S-1033) shall not exceed 810 MM Btu per hour, averaged over any rolling 3-hour period. The gas turbine in each power train (S-1030 or S-1032) shall not exceed 500 MM Btu/hour (Basis: PSD for NO_x).

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The combined heat input rate to the power train consisting of a Gas Turbine and its associated HRSG (S-1030 and S-1031 or S-1032 and S-1033) shall not exceed 19,440 MM Btu per calendar day. (Basis: PSD for PM10)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The combined cumulative heat input rate for the Gas Turbines (S-1030 and S-1032) and the HRSGs (S-1031 and S-1033) shall not exceed 12,702,000 MM Btu per year. (Basis: Offsets)

Verification: Annual heat input rates shall be included in the annual report required per AQ-22.

S-1030/S-1032 Gas Turbines and S-1031/S-1033 HRSGs shall be abated by the properly operated and properly maintained A-60/A-62 Selective Catalytic Reduction (SCR) System and A-61/A-63 CO Oxidation Catalyst System whenever fuel is combusted at those sources and the catalyst bed has reached minimum operating temperature. (Basis: BACT for NO_x)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The Gas Turbines (S-1030 and S-1032) and HRSGs (S-1031 and S-1033) when firing natural gas shall comply with requirements (a) through (f) under all operating

scenarios, including duct burner firing mode. Requirements (a) through (f) do not apply during a gas turbine start-up or shutdown. (Basis: BACT, PSD, and Toxic Risk Management Policy)

(a) The nitrogen oxide emission concentration at emission points P-60 or P-62 shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O_2, averaged over any one hour period. (BACT for NO_x when firing natural gas)

(b) The carbon monoxide emission concentration at P-60 or P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-clock hour period. (BACT for CO when firing natural gas)

(c) Ammonia (NH_3) emission concentrations at P-60 or P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. Compliance with this ammonia emission concentration limit will be demonstrated by initial source test.

(d) Precursor organic compound (POC) mass emissions (as CH_4) at P-60 or P-62 shall not exceed 2.0372 pounds per hour or 0.002515 Lb/MM Btu of natural gas fired. (BACT for POC when firing natural gas)

(e) Sulfur dioxide (SO_2) mass emissions at P-60 or P-62 shall not exceed 1.134 pounds per hour (3-hour average) (BACT) or 0.0014 Lb/MM Btu of natural gas fired. (BACT for SO_2 when firing natural gas),

(f) Particulate matter (PM10) mass emissions at P-60 or P-62 shall not exceed 4.795 pounds per hour or 0.00592 Lb/MM Btu of natural gas fired. (BACT for PM10 when firing natural gas)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-22

The Gas Turbine (S-1030 and S-1032) and HRSG (S-1031 and S-1033) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (Basis: BACT, PSD, and Toxic Risk Management Policy)

(a) Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO_2) at P-60 or P-62 shall not exceed 7.27 pounds per clock hour

(b) The nitrogen oxide emission concentration at emission points P-60 or P-62 shall not exceed 2.9 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 3-clock hour period. (BACT for NO_x)

(c) Carbon monoxide mass emissions at P-60 or P-62 shall not exceed 17.82 pounds per clock hour, averaged over any rolling 3-hour period. This

emission limitation shall be subject to adjustment based on the initial source test results. (PSD for CO)

(d) The carbon monoxide emission concentration at P-60 or P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-clock hour period. This emission limitation shall be subject to adjustment based on the initial source test results. (BACT for CO)

(e) Ammonia (NH_3) emission concentrations at P-60 or P-62 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. Compliance with this ammonia emission concentration limit will be demonstrated by initial source test.

(f) Precursor organic compound (POC) mass emissions (as CH_4) at P-60 or P-62 shall not exceed 2.0372 pounds per hour. This limit is subject to adjustment based on the results of the initial source test. Demonstration of compliance will be based on source test results. (BACT)

(g) Sulfur dioxide (SO_2) mass emissions at P-60 or P-62 shall not exceed 5.569 pounds per hour (rolling monthly average) (BACT), nor 17.82 pounds per hour (3 hour average), nor 10.96 pounds per hour (24 hour average). (NSPS)

Either fuel sulfur (TRS) or stack SO2 must be monitored and meet the following limitation, as appropriate: Sulfur dioxide (SO_2) concentrations at P-60 or P-62 shall not exceed 1.404 ppmv, on a dry basis, corrected to 15% O2 on a rolling four quarter average, nor 2.747 ppmv, on a dry basis, corrected to 15% O2 on a 24 hour average, nor 4.477 ppmv, on a dry basis, corrected to 15% O2 on a three hour average.

SO_2 concentrations in refinery fuel gas shall not exceed 51 ppm TRS on a rolling monthly average, nor 100 ppm H_2S on a 24 hour average, nor 160 ppm H_2S on any three hour average.

(h) Particulate matter (PM10) mass emissions at P-60 or P-62 shall not exceed 4.98 pounds per hour nor an average of 3.1 pounds per hours averaged over a year. This limit is subject to revision based on the results of the initial source test. Demonstration of compliance will be based on source test results. (Basis: BACT for PM10)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-22

A District approved initial source test will be commenced within 60 days of startup to demonstrate compliance with Conditions number 18 and 19. The test results will be forwarded to the District within 60 days of completion of the field test. The test should verify emission compliance near maximum firing on:

Gas Turbine firing natural gas only
Gas Turbine and HRSG firing natural gas only
Gas Turbine firing refinery fuel gas only
Gas Turbine and HRSG firing refinery fuel gas only.

(Basis: Compliance Verification with BACT)

Verification: A District approved initial source test shall be commenced within 60 days of startup to demonstrate compliance with Conditions number 18 and 19. The test results will be forwarded to the District within 60 days of completion of the field test.

The owner will conduct annual source tests and submit the results within 60 days of the test's completion. These tests will demonstrate compliance with POC and PM10 emission limits in conditions AQ-19 (f) and AQ-19 (h). (Basis: Compliance Monitoring)

Verification: Annual source test results shall be forwarded to the District within 60 days of completion of the test.

Total emissions from S-1030, S-1031, S-1032, and S-1033 shall not exceed the following annual limits: (Basis: Cumulative Increase, Offsets, PSD)

NOx – 57.207 TPY (based on CEM data)
POC - 16.512 TPY (based on source test results plus fugitive emissions of 0.945 tpy)
PM10 – 13.606 TPY (based on source test results)
SOx – 43.822 (based on quarterly curtailment group compliance under condition AQ-2)
CO - 139.694 TPY (based on CEM data)

Limits for POC, PM10, and CO are subject to revision based on initial source test results.

Verification: An annual report will be prepared by owner and submitted to the District and the CEC CPM documenting compliance with these annual limitations to mass emissions. An annual report will be prepared by owner and submitted to the District documenting compliance with these annual limitations to mass emissions. A copy of the annual report shall be forwarded to the City of Benicia Public Library.

To demonstrate compliance with conditions AQ-19(f), AQ-19(g) and AQ-19(h), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM_{10}) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO_2) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

(a) For each calendar day, POC, PM_{10}, and SO_2 emissions shall be summarized for: the combined power train: [Gas Turbine (S-1030)/ HRSG (S-1031)] or [Gas Turbine (S-1032)/ HRSG (S-1033].

(b) On a daily basis, the 365 day rolling average cumulative total POC, PM_{10}, and SO_2 mass emissions, for both power trains [Gas Turbine (S-1030)/ HRSG (S-1031)] or [Gas Turbine (S-1032)/ HRSG (S-1033].

(Basis: Offsets, PSD, Cumulative Increase)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission. The information shall be included in initial and annual source test reports and the annual reports required by AQ-22.

The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District within 60 days of conducting the tests. (Basis: Source Test Compliance Verification

Verification: The owner/operator shall notify the District's Source Test Section in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s).

The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Basis: Regulation 2-6-502)

Verification: The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual

The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.),

source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents.

Verification: These records shall be maintained on site for a minimum of five years and shall be available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The owner/operator shall notify the District of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Basis: Regulation 2-1-403)

Verification: The owner/operator shall notify the District of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition.

The stack height of emission points P-60 and P-62 shall each be at least 80 feet above grade level at the stack base. (Basis: PSD, TRMP)

Verification: The design details providing the stack specifications shall be submitted to the District for review and approval at least 30 prior to the start of construction.

The Owner/Operator shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Basis: Regulation 1-501)

Verification: The design details providing the type, specifications, and location of these sampling ports shall be submitted to the District for review and approval at least 30 prior to installation of the sampling ports.

Within 180 days of the issuance of the Authority to Construct, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Basis: Regulation 1-501)

Verification: The design details providing the type and specifications of these sampling ports, monitors and source tests shall be submitted to the District for review and approval within 180 day from the decision.

The Cogeneration project shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Basis: Regulation 2, Rule 7)

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The startup period for the S-1030 and S-1032 Gas Turbines shall last for no more than one hour.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Pursuant to BAAQMD Regulation 2, Rule 6, section 404.3, the owner/operator of the Valero Power Plant shall submit an application to the BAAQMD for a significant revision to the Major Facility Review Permit prior to commencing operation. (Basis: Regulation 2-6-404.3)

Verification: The project owner shall submit an application, pursuant to BAAQMD Regulation 2, Rule 6, section 404.3, to the District prior to commencing operation.

Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the Valero Power Plant shall not operate either of the gas turbines until either: 1) a Title IV Operating Permit has been issued; 2) 24 months after a Title IV Operating Permit Application has been submitted, whichever is earlier. (Basis: Regulation 2, Rule 7).

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Fugitive Equipment

All hydrocarbon control valves installed as part of the Cogeneration Project in Phase I shall be equipped with live loaded packing systems and polished stems, or equivalent.

Verification: The project owner shall provide copies of the design details of the ancillary equipment to the District at least 90 days prior to the delivery of the equipment to the project site.

All accessible hydrocarbon valves shall be inspected quarterly and inaccessible valves shall be inspected annually using a District approved leak detection device. Any valve found to be leaking in excess of 100 ppm shall be subject to the leak repair provisions of District Regulation 8, Rule 18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

All connectors installed in the piping systems as a result of Phase I of the Cogeneration project shall be equipped with graphitic-based gaskets. Any connector found to be leaking in excess of 100 ppm shall be subject to the leak repair provisions of Regulation 8, Rule 18

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

All new hydrocarbon centrifugal compressors installed as part of Phase I of the Cogeneration project shall be equipped with "wet" dual mechanical seals with a heavy liquid barrier fluid, or dual dry gas mechanical seals buffered with inert gas. All compressors shall be inspected and repaired in accordance with District Regulation 8, Rule 18. All compressors found to leaking in excess of 500 ppm shall be subject to the leak repair provisions of Regulation 8, Rule 18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

All new fugitive equipment in organic service will be integrated into the owner's fugitive equipment monitoring and repair program and will meet the requirements of District Regulation 8-18.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

The Phase I project shall consist of no more than 400 valves, 1200 connectors and 2 compressors. The POC emissions from these fugitive components shall not exceed 0.597 tons/year. The annual mass limit for POC may be adjusted based on final fugitive component count. Any additional POC offsets required due to a larger fugitive component count will need to be provided prior to permit issuance.

Verification: The project owner shall make the site and records available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

Contemporaneous Emissions reduction credit

The S-38 and S-39 steam boilers shall be completely shutdown no later than 90 days after startup of the S-1030 and S-1031 power train. (Basis: offsets)

Verification: The project owner shall surrender the operating permits for S-38 and S-39 to the District 90 days after start-up S-1030 and S-1031.

The S-41 steam boilers shall be completely shutdown no later than 90 days after startup of the S-1032 and S-1033 power train. (Basis: offsets)

Verification: The project owner shall surrender the operating permits for S-41 to the District 90 days after start-up S-1032 and S-1033.

CONDITIONS OF CERTIFICATION numbers AQ-43 through AQ-50 are reserved for future use.

ENERGY COMMISSION STAFF CONDITIONS

These conditions are not included in the District's Determination of Compliance.

For the purposes of these conditions, the following definitions apply:

(1) ACTIVE OPERATIONS shall mean any activity capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, or heavy- and light-duty vehicular movement.

(2) CHEMICAL STABILIZERS mean any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation; and should meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(3) CONSTRUCTION/DEMOLITION ACTIVITIES are any on-site mechanical activities preparatory to or related to the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities; grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(4) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust.

(5) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(6) EARTH-MOVING ACTIVITIES shall include, but not be limited to, grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, or soil mulching.

(7) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man.

(8) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of ten consecutive days.

(9) STABILIZED SURFACE means:

- (A) any disturbed surface area or open storage pile which is resistant to wind-driven fugitive dust;
- (B) any unpaved road surface in which any fugitive dust plume emanating from vehicular traffic does not exceed 20 percent opacity.

(10) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

AQ-51 The project owner shall provide 0.661 tons per year of PM10 ERCs

Verification: The project owner shall surrender the PM10 ERCs to the District and provide documentation to the CEC CPM 30 days after the start of project operation.

The project owner shall implement a CEC CPM approved fugitive Dust Control Plan.

Protocol: The plan shall include the following:

1. A description of each of the active operation(s) which may result in the generation of fugitive dust;
2. An identification of all sources of fugitive dust (e.g., earth-moving, storage piles, vehicular traffic, etc.
3. A description of the control measures to be applied to each of the sources of dust emissions identified above (including those required in AQ-71 and -72 below). The description must be sufficiently detailed to demonstrate that the applicable best available control measure(s) as specified in Table 1 (attached) will be utilized and/or installed during all periods of active operations;
4. In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the required control measures for any of the sources identified, a justification statement must be provided to explain the reason(s) why the required control measures cannot be implemented.

Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the CEC CPM for review and approval. The project owner shall maintain daily records to document the specific actions taken pursuant to the plan and Table 1. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

During the construction phase of the project, the project owner shall:

1. Prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations, or take at least one of the actions listed in Table 2 (attached) to prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations;
2. Install and use a track-out control device to prevent the track-out of bulk material from areas containing soils requiring corrective to other areas within the project construction site and laydown area;
3. Minimize fugitive particulate emissions from vehicular traffic on paved roads and paved parking lots on the construction site by vacuum

mechanical sweeping or water flushing of the road surface to remove buildup of loose material. The project owner shall inspect on a daily basis the conditions of the paved roads and parking lots to determine the need for mechanical sweeping or water flushing.

The project owner shall maintain a daily log during the construction phase of the project indicating: 1) the manner in which compliance with this condition or Table 2 is achieved, and 2) the date and time when the inspection of paved roads and parking lots occurs and the date and time(s) when the cleaning operation occurs. The logs shall be made available to the California Energy Commission CPM upon request.

At any time when fugitive dust from OMGP project construction is visible in the atmosphere beyond the property line, the project owner will identify the source of the fugitive dust and implement one or more of the appropriate control measures specified in Table 3 (attached)

The project owner will maintain a daily log recording the dates and times that measures in Table 3 (attached) have been implemented and make them available to the CPM upon request.

The project owner shall mitigate, to the extent practical, construction related emission impacts from off-road, diesel fired construction equipment. Available measures which may be used to mitigate construction impacts include the following:

- Catalyzed Diesel Particulate Filters (CDPF);
- Ultra Low Sulfur Diesel fuel, with a sulfur content of 15 ppm or less (ULSD);
- Diesel engines certified to EPA and CARB 1996 or newer off-road equipment emission standards.

Additionally, the project owner shall restrict idle time, to the extent practical, to no more than 10 minutes.

The use of each mitigation measure is to be determined in advance by a Construction Mitigation Manager (CMM), who will be available at the project site(s). The CMM must be approved by the CPM prior to the submission of any reports.

The CMM shall submit the following reports to the CPM for approval:

- Construction Mitigation Plan
- Reports of Change and Mitigation Implementation
- Reports of Emergency Termination of Mitigation, as necessary

Diesel Construction Equipment Mitigation Plan:
The Construction Mitigation Plan shall be submitted to the CPM for approval prior to rough grading on the project site, and must include the following:

A list of all Diesel fueled, off-road, stationary or portable construction-related equipment to be used either on the project construction site or the construction sites of the related linear facilities. Equipment used less than 10 days need not be included in this list.

Each piece of construction equipment listed under item (1) must demonstrate compliance with the following mitigation requirements:

Engine Size (bhp)	1996 CARB or EPA Certified Engine	Required Mitigation
<100 bhp	Yes or No	- ULSD
>100 bhp	Yes	- ULSD
>100 bhp	No	- ULSD and - CDPF, if suitable as determined by the CMM

If compliance can not be demonstrated as specified under item (2), then the project owner may appeal for relief to the CPM. However, the owner must demonstrate that they have made a good faith effort to comply as specified under item (2).

Report of Change and Mitigation Implementation

Following the initiation of construction activities and if changes to mitigation measures are necessary, the CMM shall submit a Report of Change and Mitigation Implementation for approval to the CPM. This report must contain at a minimum the cause of any deviation from the Construction Mitigation Plan, and verification to the CPM of the Construction Mitigation Plan measures as well as new measures that were implemented.

The following is acceptable proof of compliance, other methods of proof of compliance must be approved by the CPM.

1. EPA or CARB 1996 off-road equipment emission standards:
   a. A copy of the certificate from EPA or CARB.
2. Purchase and use of ultra-low sulfur fuel (15ppm or less).
   a. Receipt or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date; **and**
   b. A copy of the text included in the contract agreement with all contractors and sub-contractors for use of the ultra-low sulfur fuel in diesel burning construction equipment as identified in the Construction Mitigation Plan.

3. Installation of CDPF:

   a. The suitability of the use of soot filters is to be determined by a qualified mechanic or engineer who must submit a report to the CPM for approval.

   b. Installation is to be verified by a qualified mechanic or engineer.

4. Construction equipment engine idle time:

   a. A copy of the text included in the contract agreement with all contractors and sub-contractors to keep engine idle time to 10 minutes or less to the extent practical.

Report of Emergency Termination of Mitigation
If a specific mitigation measure is determined to be detrimental to a piece of construction equipment or is determined to be causing significant delays in the construction schedule of the project or the associated linear facilities, the mitigation measure may be terminated immediately. However, notification containing an explanation for the cause of the termination must be sent to the CPM for approval. All such causes are restricted to one of the following justifications and must be identified in any Report of Emergency Termination of Mitigation.

1. The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.
2. The measure is causing or is reasonably expected to cause significant engine damage.
3. The measure is causing or is reasonably expected to cause a significant risk to nearby workers or the public.
4. Any other seriously detrimental cause which has approval by the CPM prior to the change being implemented.

Verification: The project owner will submit to the CPM for approval the qualifications of the CMM at least 45 days prior to the due date for the Diesel Construction Equipment Mitigation Plan. The project owner will submit the Diesel Construction Equipment Mitigation Plan to the CPM for approval 30 calendar days prior to rough grading on the project site. The project owner will submit the Report of Change and Mitigation Implementation to the CPM for approval no later than 10 working days following the use of the specific construction equipment on either the project site or the associated linear facilities. The project owner will submit a Report of Emergency Termination of Mitigation to the CPM for approval, as required, no later than 10 working days following the termination of the identified mitigation measure. The CPM will monitor the

approval of all reports submitted by the project owner in consultation with CARB, limiting the review time for any one report to no more than 20 working days.

TABLE 1
BEST AVAILABLE FUGITIVE DUST CONTROL MEASURES

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS
Earth-moving (except construction cutting and filling areas, and mining operations)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the CEC CPM, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.
Earth-moving: Construction cut areas and mining operations:	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	Apply chemical stabilizers within five working days of grading completion; OR
	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR
	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	Apply chemical stabilizers; OR
	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
	Install temporary coverings; OR
	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.
ALL CATEGORIES	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 1 may be used.

TABLE 2
TRACK-OUT CONTROL OPTIONS

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 2 may be used.

TABLE 3
CONTROL MEASURES FOR WIND CONDITIONS EXCEEDING 25 MPH

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	Cease all active operations; OR
	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
	Apply chemical stabilizers prior to wind event; OR
	Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
	Take the actions specified in Table 1, Item (3c); OR
	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	Apply chemical stabilizers prior to wind event; OR
	Apply water twice [once] per hour during active operation; OR
	Stop all vehicular traffic.
Open storage piles	Apply water twice [once] per hour; OR
	Install temporary coverings.
Paved road track-out	Cover all haul vehicles; OR
	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

REFERENCES

ARB 1988. Air Resources Board, Stationary Source Division, Proposed Adoption of Regulations Limiting the Sulfur Content and Aromatic Hydrocarbon Content of Motor Vehicle Diesel Fuel, October 1988.

ARB 1992. California Air Resources Board, "Sources and Control of Nitrogen Emissions", Sacramento, August. p. 38

ARB 1996. Air Resources Board. "Second Triennial Review of the Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California", October 1996.

ARB 1999. Air Resources Board. The 1999 California Almanac of Emissions and Air Quality.

ARB 2000a. California Air Quality Data, Annual and Quarterly Summaries, Aerometric Division, Sacramento.

ARB 2000b Air Resource Board. "Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards"

Clean 2000. Clean Diesel Technologies, Test Results Confirm that a Platinum/Cerium Diesel Fuel Combustion Catalyst Equals or Exceeds Low Sulfur Diesel Fuel in Reduction Particulate Emissions from a Heavy Duty Diesel Engine, News Bulletin, January 10, 2000.

District 2001. Bay Area Air Quality Management District Rulebook, July 2000.

District 2001. Preliminary Determination of Compliance, Application Number 2488 and 2695. Bay Area Air Quality Management District, August 15, 2001.

EPRI 1990. "Combustion Turbine NOx Control News." Electric Power Research Institute. RP 2936, Summer 1990, Issue 3.

Kehlhofer, Rolf H, et al, 1999. Combined –Cycle Gas & Steam Turbine Power Plants, 2nd Edition, 1999.

VCP 2001a. Application for Certification, Valero Cogeneration Project (01-AFC-5), May 2001.

VCP 2001b. Supplement to the Application for Certification, Valero Cogeneration Project (01-AFC-5), June 2001.

CULTURAL RESOURCES

INTRODUCTION

Page 4.3, Paragraph 1

The cultural resources section discusses potential impacts of the proposed Valero Cogeneration Project (VCP) in Benicia regarding cultural resources, which are defined as the structural and cultural evidence of the history of human development and life on earth. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant cultural resources, including prehistoric archaeological resources, historic archaeological resources, and ethnographic resources, during project construction, operation and closure. Energy Commission staff designated all of the CEQA checklist items for cultural resources as "less than significant impact". A brief cultural overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to cultural resources. The section concludes with the staff's proposed monitoring and mitigation measures with respect to cultural resources, with the inclusion of eight conditions of certification.

POWER PLANT EFFICIENCY

FEDERAL

Page 5.3-1, Paragraph 4

FERC 292.205 applies to required efficiencies of operation for qualifying facilities. Should the applicant file as a QF (qualifying facility) this section would need to be met. Should the applicant decide not to file as a QF, no federal laws apply to the efficiency of this project.

Compliance With Energy Standards

Page 5.3-3, Paragraph 5

The applicant has not made a decision to file as a qualifying facility under the appropriate energy efficiency standards for cogeneration projects. The applicant has provided the necessary information (Valero 2001a, AFC Appendix O) and calculations to be covered as a qualifying facility. Should the applicant decide not to file as a qualifying facility, no standards would apply to the efficiency of the VCP.

CONDITIONS OF CERTIFICATION

Page 5.1-14, Paragraph 3

GEN-10: Phase I (51 MW) of the Valero Project shall be on line by no later than December 31, 2002. Phase 2 (51 MW) of the Valero Project is planned to be on line by no later than December 31, 2002. If either phase of the project is not fully operational by December 31, 2002, the Energy Commission will conduct a hearing to determine the cause of the delay and consider what sanctions if any are appropriate. If the Energy Commission finds that the project owner, without good cause, failed to have any portion of the project in operation by December 31, 2002, the Energy Commission may deem that the project owner has forfeited its certification as to the portions of the project not in operation by December 31, 2002. If the applicant elects not to construct Phase 2 of the Valero Project, it may waive the right to the good cause hearing and shall forfeit its certification as to Phase 2.

LAND USE

CITY OF BENICIA GENERAL PLAN

Circulation

Page 4.5-2, addition to paragraph 1

- Maintain at least Level of Service D on all city roads, street segments, and intersections. (Policy 2.20.1)

Responses to Hazards

Page 4.5-3, addition to existing bullets

- Ensure that existing and future neighborhoods are safe from risks to public health that could result from exposure to hazardous materials. (Goal 4.7)
- Require that all sites known or suspected to have unexploded ordnance and/or a toxic history be tested and remediated before any development can occur. (Policy 4.75)
- Support implementation of Bay Area Clean Air Plan. (Policy 4.10.1)
- Require that projects with identified significant air quality impacts include all feasible mitigation measures needed to reduce impacts to less than significant levels. (Program 4.10.B)
- Minimize harm from geologic hazards. (Goal 4.11)
- Require geotechnical engineering reports to address site stability and building foundation integrity for projects involving substantial grading. (Program 4.11.A)
- Require hazardous materials and hazardous waste management handling and disposal procedures that are protective of human health and the environment. (Goal 4.16)

CITY OF BENICIA GENERAL PLAN

Noise

Page 4.5-3, additional language following Responses to Hazards

- Evaluate the compatibility of proposed projects with respect to existing and future transportation noise levels by using General Plan Tables 4-3 and 4-4. (Policy 4.23.1)
- Use noise dampening building standards, site design, landscaping and setbacks instead of sound walls, wherever possible. (Policy 4.23.2)

- Use available techniques such as building insulation, berms, building design and orientation, buffer yards, and staggered operating hours to minimize noise at the source.(4.23.2)

Water

Page 4.5-3, additional language following Responses to Hazards

- Approve development plans only when a dependable and adequate water supply to serve the development is assured. (Policy 2.36.1)

Visual Character

Page 4.5-3, additional language following Responses to Hazards

- Protect and enhance scenic roads and highways. (Goal 3.9)
- Preserve vistas along I-780 and I-680. (Policy 3.9-1)

Energy Efficiency

Page 4.5-3, additional language following Responses to Hazards

- Improve energy efficiency (Goal 3.27)
- Promote energy efficiency in all new development and during rehabilitation of existing homes (3.27.1).

CITY OF BENICIA ZONING ORDINANCE

Page 4.5-3, Paragraph 6

If the City of Benicia was the CEQA lead agency for this project, rather than the Energy Commission, the City's Planning Commission would review an application from Valero for a Conditional Use Permit. The Planning Commission would make certain findings under the California Zoning Law and the Benicia Zoning Ordinance (Benicia Zoning Ordinance Title 17, Section 17.104.060).

Page 4.5-4, Paragraph 2

The Use Permit Required Findings, are listed as Land Use Appendix at the back of this **LAND USE** section.

Page 4.5-4, insert after Paragraph 3

The City of Benicia Zoning Ordinance, Chapter 17.108, requires design approval for new development with the exception of single family residences. The City's Planning Director is authorized to grant design approval for projects in the IG (General Industrial) zoning district. Prior to approval, the Planning Director needs to make design review findings which address the following concepts:

- The location and configuration of structures need to be visually harmonious with their sites and with surrounding sites and structures; and do not unnecessarily block scenic views from other buildings or public parks; and do not dominate their surroundings to an extent inappropriate to their use.

- The architectural design of structures, their materials and colors need to be visually harmonious with surrounding development, and with the natural landforms and vegetation of the areas in which they are proposed to be located.

- Plans for landscaping of open spaces must be consistent with the Zoning Ordinance's design review requirements; landscaping plans must provide visually pleasing settings for on-site structures and adjoining/nearby sites; landscaping plans must blend harmoniously with the natural landscape.

- Excessive and unsightly grading of hillsides must be prevented; natural landforms and existing vegetation is to be preserved where feasible.

- Adequate, safe, and efficient parking and circulation areas must be provided, which conform to the design review requirements.

- A functional, efficient, and attractive site design must be provided, which is sensitive to existing uses in the area, and to the topography and conditions of the site.

- New development must be consistent with specific design guidelines developed for use within the community, where applicable, and to any specific plan or planned development plan.

The City staff has concluded that the VCP is consistent with the Zoning Ordinance's design review requirements (City of Benicia, July 19, 2001). The project will blend in with existing refinery equipment, and will be almost completely shielded from view from surrounding areas. The proposed site grading will be limited to that required for the project, and no new parking areas or landscaping areas will be required.

ENVIRONMENTAL CHECKLIST

Page 4.5-5, Environmental Checklist, item b)

Change the "X" from the "No Impact" box to the "Less than Significant Impact" box.

Land Use Planning

Page 4.5-6, B. heading change

Change the heading to say "Less Than Significant Impact"

Page 4.5-6, B. paragraph 1

Staff has concluded that the project complies with the Benicia Zoning Ordinance provisions for General Industrial uses, the Zoning Ordinance's Design Review criteria, and the Industrial Design Guidelines.

Page 4.5-6, B. paragraph 3

Delete the sentence "Staff has concluded that the project would have no impact".

Page 4.5-7, B. paragraph 2

Given this objective, and the proposed project's consistency with the City of Benicia's applicable LORS, impacts would be less than significant. Staff has concluded that land use impacts would be less than significant rather than "no impact", because the:

- the City of Benicia's Planning Commission needs to make Use Permit Required Findings;
- the City of Benicia's Planning Commission needs to issue a Conditional Use Permit; and
- the City of Benicia's Planning Director needs to make Design Review findings.

CUMULATIVE IMPACTS

Page 4.5-7, change paragraph

Staff concludes that there are no cumulative land use impacts. Valero's MBTE phaseout is the only other firm project that staff is aware of in the area. Valero's refinery operation may have an unscheduled turnaround (i.e. a shutdown of a major part, or all of the refinery in order to commence a major repair or maintenance operation), From the land use perspective, staff has concluded that the possibility of an unscheduled turnaround in conjunction with the VCP and the MBTE phaseout, does not present any significant impacts. The City of Benicia has raised some concerns regarding the cumulative traffic impacts of an unscheduled turnaround in combination with the VCP and the MTBE phaseout. The City's traffic concerns are addressed in the **TRAFFIC AND TRANSPORTATION** section.

CONCLUSIONS

Page 4.5-7, change paragraph

The proposed use would be consistent with the provisions of the City of Benicia's General Plan, Zoning Ordinance including its Design Review criteria, and the City's Industrial Design Guidelines. Therefore, the impacts for Land Use, are less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

Page 4.5-7, delete

None.

REFERENCES

Insert additional References

City of Benicia, 2001. Preliminary Determination of Compliance. July 19,2001

City of Benicia, 2001. Comments on the CEC Staff Assessment of August 2, 2001, August 10, 2001

NOISE

INTRODUCTION

Page 4.6-1, Paragraph 1

This section evaluates the potential noise effects associated with the construction and operation of the Valero Cogeneration Project (VCP), which would be located in Benicia, California. As described in the AFC, the proposed project would be to construct a gas-fired simple cycle power plant consisting of two GE LM6000 gas turbines at the Valero Refinery. The proposed project would connect to the existing transmission lines serving the refinery. The project would include approximately 1,000 feet of new refinery fuel gas line, and 500 feet of new natural gas supply line.

LOCAL

Page 4.6-3, Paragraph 5

The City of Benicia General Plan contains noise standards for stationary noise sources relative to noise sensitive developments. The standards are intended to prevent new industrial noise sources from encroaching upon existing noise-sensitive developments. Noise: Table 2 lists the noise performance standards that apply to the proposed project.

Noise: Table 2 - City of Benicia General Plan Noise Standards

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, dBA	55	50
Maximum Level, dBA	75	70

Since the proposed project would operate on a continuous basis over the 24-hour day, the nighttime standards of the General Plan would apply at the nearest residential properties.

The General Plan further states that, for noise sources that occur on an infrequent basis and are considered to be safety equipment (such as flaring or pressure relief valves), a maximum noise level of 75 dBA is acceptable, as measured from the receiver's property line.

Operational Noise

Page 4.6-7, Last Paragraph (continues to page 4.6-8)

The noise level from the proposed power plant was modeled to evaluate whether the new plant would contribute an incremental increase in noise levels at the nearest residential receptors. All major pieces of equipment were assumed to operate continuously for the purpose of the modeling analysis. The projected VCP noise level at

the closest residential receptor during the operation of two gas turbines is 39 dBA Leq (URS 2001b). Based on the results of the noise survey on May 21-23, 2001, this noise level would be below the existing ambient noise level. The cumulative noise levels (including the noise from two gas turbines and the existing refinery) would increase by less than 2 dBA.

Steam Blows

Page 4.6-8, Paragraph 5

The highest noise levels that would be generated during the construction of the VCP facility would be associated with steam blows, if this technique is required. After erection and assembly of the feed water and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam path, and could adversely affect refinery equipment and the HRSG.

In order to prevent this, before the steam system is connected to the refinery, the steam line may have to be temporarily routed to the atmosphere. High-pressure steam (approximately 600 psi) will be raised in the existing boilers and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system. A series of short steam blows, lasting about five minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the new heat recovery steam generator, which is then ready for operation.

These steam blows can produce very high noise levels, perhaps as high as 130 dBA at a distance of 100 feet. At the nearest residence, which is about 3,000 feet away, it will be appropriate to require that the noise level does not exceed the City of Benicia General Plan noise standard of 75 dBA for pressure relief valves. In order to meet this standard, the steam blow piping could be equipped with exhaust silencers that will reduce noise levels by about 25 dBA. Additionally, shielding could be provided at the silencer outlet in the form of temporary barriers. Staff therefore proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see measures described in proposed Conditions of Certification **NOISE-4** and **NOISE-5** below) to minimize annoyance to residents.

Linear Facilities

Page 4.6-9, Paragraph 4

There will be no new transmission lines outside of the project boundary. The existing 12 kV transmission line serving the refinery will be retained, and the transmission lines onsite will be routed underground from the combustion gas turbines to a new switch house. New refinery gas and natural gas lines will be placed underground. Therefore, there will be no noise impacts associated with construction of the linear facilities.

PROPOSED CONDITIONS OF CERTIFICATION

Page 4.6-10, Paragraph 5

NOISE-1 At least 15 days prior to the start of project-related ground disturbing activities, the project owner shall notify all residents and business owners within one-half mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. This telephone number shall be included in the project notification mailing required above. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of project-related ground disturbing activities, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

Page 4.6-12, Paragraph 1

NOISE-4 If a high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 75 dBA measured at the nearest sensitive receptor. The project owner shall conduct steam blows only during the hours of 8 a.m. to 5 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance. If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected period of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise levels do not exceed 50 dBA Leq at any affected residence. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

Page 4.6-13, Paragraph 1

No new pure tone components may be produced by operation of the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately treated or located to ensure that the maximum noise level at any sensitive receptor does not exceed 75 dBA.

Page 4.6-13, Paragraph 3

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM, to the City of Benicia, and to the Benicia Public Library. Included in the report shall be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. If additional mitigation measures are necessary within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

Page 4.6-13, Paragraph 4

NOISE-7 Within 30 days of the project first achieving normal operation, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Page 4.6-13, Last paragraph

NOISE-8 Construction noise levels shall be limited to 55 dBA Leq as measured at any affected residence, during any hour of the day or night.

STATE

Page 4.12-2, Paragraph 1.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the San Francisco Bay Region Water Quality Control Plan. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes with elevated temperature to the state's waters. These standards are applied to the proposed project through the Waste Discharge Requirements (WDRs) permit.

LOCAL

Page 4.12-3, Paragraph 3.

City of Benicia General Plan

The City of Benicia General Plan sets forth policies that address the protection of soil and prime agricultural farmland, as defined by the NRCS. In general, the City of Benicia's land use policies support the location of industrial enterprises in the areas already developed and designated for general industrial land uses.

Other applicable City of Benicia General Plan policies include:

Policy 2.36.1. Approve development plans only when a dependable and adequate water supply to serve the development is assured.

Policy 4.7.5. Require that all sites known or suspected to have unexploded ordnance and/or a toxic history be tested and remediated before any development can occur.

ADDITIONAL WATER SUPPLY ANALYSIS

Page 4.12-11, Paragraph 3.

City of Benicia Supply

City of Benicia has also developed a water banking agreement with the Mojave Water Agency (MWA), which serves to help buffer deficiencies in dry years for City of Benicia. During normal or wet years, Benicia may make available to MWA a portion of Benicia's SWP allocation for groundwater recharge. During dry years, City of Benicia may draw 50% of the water it has banked, or up to 10,000 acre-feet/year from MWA's SWP

allocation after it has accumulated and banked 20,000 acre-feet in previous years. When Benicia chooses to draw on its banked water, MWA is capable of making-up the reduction in its SWP supply from groundwater withdrawal. As a recent indicator of cost of new water supply in the region, the Cities of Vacaville and Fairfield recently acquired rights to use a portion of Kern County Water District's SWP allocation at a cost of $1,000/acre-foot.

CUMULATIVE IMPACTS

Page 4.12-16, Paragraph 1.

The project will not significantly change the volume or quality of wastewater discharge as proposed. The RWQCB has determined that no changes to the existing NPDES permit for the Valero refinery will be necessary. Please refer to the above section entitled **Additional Water Supply Analysis** for a discussion of cumulative impacts associated with water supply.

PROPOSED CONDITIONS OF CERTIFICATION

Page 4.12-18, Condition of Certification 3.

SOIL & WATER 3: During project operation, the project owner will collect and convey stormwater into the refinery's existing wastewater treatment plant prior to discharge. Any stormwater leaving the site will be discharged in compliance with the refinery's existing NPDES Permit and Storm Water Pollution Prevention Plan (SWPPP). The SWPPP for refinery operations must be revised to include the project operations and will be submitted to the RWQCB for review and to the Energy Commission CPM for review and approval. The revisions to the SWPPP shall be approved by the Energy Commission staff prior to commercial operation. The project will not operate without this permit in place.

Verification: The project owner will submit to the CPM and the RWQCB a copy of the revised Storm Water Pollution Prevention Plan (SWPPP) prepared under the requirements of the existing refinery NPDES Permit, at least 60 days prior to the start of commercial operation. The revisions to the SWPPP shall be approved by Energy Commission staff prior to commercial operation.

Page 4.12-19, Condition of Certification 4.

SOIL & WATER 4: The project owner will install metering devices and record on a monthly basis the amount of fresh and recycled water used by the project. The annual summary will include the monthly range and monthly average of daily usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet. For subsequent years the annual summary will also include the yearly range and yearly average water use by the project. This information will be supplied to the Energy Commission and the City of Benicia.

Verification: The project owner will submit a project water use summary to both the CPM and the City of Benicia on an annual basis for the life of the project. Any significant changes in the water supply for the project during construction or operation of the plant shall be in conformance to Condition **Soil and Water 6** and shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change.

Page 4.12-19, Condition of Certification 5.

SOIL & WATER 5: Due to the potential for soil contamination at the site of the project, the soil shall be stockpiled and characterized at a rate of at least one four-point sample for every 6 inches of excavation. The characterization would focus on heavy metals and leachability testing for both off-site and on-site disposal options. In addition, color and odor of soils excavated are to be monitored, and if suspect soils are encountered, they are to be stockpiled separately for characterization. Any groundwater that may need dewatering during excavation shall be tested for contamination. A Site Investigation Workplan identifying how soil and groundwater will be tested for contaminants and the disposal methods will be provided to staff for review and approval.

Verification: At least fifteen days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification, the project owner will provide a Site Investigation Workplan for approval. The plan must be approved prior to the commencement of site mobilization activities. The project owner will provide sampling results during excavation activities to the CPM on a weekly basis.

Page 4.12-19, Condition of Certification 6.

SOIL & WATER 6: Within three years of certification of the Valero Cogeneration Project, the refinery will implement a water reuse or reduction step that will fully offset the amount of water used by the VCP. The source of water for reuse may be either a refinery wastewater stream or the City of Benicia's wastewater treatment plant secondary effluent. The amount of water reuse or reduction must be, at a minimum, the annual amount as documented in **SOIL & WATER 4**. If the metering system should fail, the minimum water use offset will be equivalent to the average monthly VCP water use for the previous twelve months. The project owner's water reduction or reuse plan shall be prepared in consultation with the City of Benicia, consistent with the Good Neighbor Agreement between the parties, which encourages the project owner to achieve even broader reductions in its use of fresh water through use of recycled water. Recycled water use must comply with all Department of Health Services requirements as specified under Title 22 of the CCR and must receive proper environmental review, based on the actions being proposed.

Verification: On an annual basis, following VCP certification and until the offset is implemented, the project owner shall provide the CPM and City of Benicia a status report of its recycled water study/plan including status of its consultation with

City of Benicia. The applicant shall provide a draft plan for water reuse or reduction to the CPM for review and approval no later than twenty-four (24) months following the certification date of the VCP. The project owner shall implement the water use offset no later than the three-year anniversary of certification. The project owner shall install water supply metering devices, adequate to account for the water reduction or reuse, and provide water use reports to the CPM and the City of Benicia in accordance with **SOIL & WATER 4**.

Page 4.12-14, Tables 2 & 3.

Soil and Water Table 2
CITY OF BENICIA - SUMMARY OF WATER DELIVERIES (Acre-Feet), 1991 – 2001

Year	Benicia NBA	Mojave Exch.	1962 Vallejo Agree.	1992 Vallejo Agree.	Benicia/ Vallejo Exchange	Solano Irrig.	Berryessa Pool/Exch. Water	Suisun NBA Water	Sched. 12D Water	NBA Interruptible/ Carryover	Water Conserv.	Total
1992	4,847		1,100	1,011	1,809		0		98	911		9,776
1993	9,658		26	0			0	0	0			9,684
1994	6,444		737	0			0	132	0	4,215		11,528
1995	9,064		0	0			2,087	0	0			11,151
1996	10,507		0	0			1,231			101		11,839
1997	11,721	2,000	0	0		727						14,448
1998	8,482	2,000	0	0						3,146		13,628
1999	11,018	3,000	548	0		977				0		15,543
2000	11,290	4,000	752	0		770				0		16,812
2001	5,593	0	1,252	3,744		0				1,784	395	12,768

Notes:

1. Actual water used by City of Benicia excludes water banked to Mojave Exchange during 1997 – 2000;
2. Because Schedule 12D Water is not considered a firm source of supply, it is not included in the total allotment of available supply.

Soil and Water Table 3
CITY OF BENICIA - SUMMARY OF WATER ALLOTMENT (Acre-Feet), 1991 – 2001

Year	Benicia NBA	Mojave Exch.	1962 Vallejo Agree.	1992 Vallejo Agree.	Benicia/ Vallejo Exchange	Solano Irrig.	Berryessa Pool/Exch. Water	Suisun NBA Water	Sched. 12D Water	NBA Interruptible/ Carryover	Water Conserv.	Total
1992	4,847		1,100	4,400	2,556		6,798		15,176	911		20,612
1993	12,730		1,100	4,400			6,798	0	15,176			25,028
1994	6,444		1,100	4,400			8,494	150	15,176	6,184		26,772
1995	13,540		1,100	4,400	0		8,494	150	10,961			27,684
1996	13,950		1,100	4,400			1,231			101		20,782
1997	14,350		1,100	4,400		727				0		20,577
1998	14,760	1,000	1,100	4,400						3,146		24,406
1999	15,170	2,000	1,100	4,400		977						23,647
2000	15,570	3,500	1,100	4,400		770						25,340
2001	5,593	5,500	1,100	4,400						1,784	395	18,772

Verification: Notes:

1. Benicia's North Bay Aqueduct (NBA) Allotment recognizes historical dry-year curtailments from the SWP limiting allotments in the following years: 1) 2001 @ 35% of the 15,980 AF normal; 2) 1994 @ 53% of the 13,105 AF normal; and 3) 1992 @ 45% of the 10,770 AF normal allocation.
2. Because Schedule 12D Water is not considered a firm source of supply, it is not included in the total allotment of available supply.

Page 4.12-15, Table 5.

Soil and Water Table 5
CITY OF BENICIA
SUMMARY OF UTILIZATION – ALLOTMENTS VS. DELIVERIES (Acre-Feet), 1992 – 2001

Year	Total Deliveries (1)	Deliveries to Mojave Exchange (2)	Net Deliveries to Benicia (3)		Total Supply Allotments (4)	Mojave Exchange Water Avail. (5)	Supply Allotments w/o Mojave Exch. (6)		% Utilization w/ Mojave Exchange (3)/(4)		% Utilization w/o Mojave Exchange (3)/(6)
1992	9,776		9,776		20,612		19,701		47%		50%
1993	9,684		9,684		25,028		25,028		39%		39%
1994	11,528		11,528		26,772		26,772		43%		43%
1995	11,151		11,151		27,684		27,684		40%		40%
1996	11,839		11,839		20,782		25,473		57%		46%
1997	14,448	2,000	12,448		20,577		24,541		60%		51%
1998	13,628	2,000	11,628		24,406	1,000	23,406		48%		50%
1999	15,543	3,000	12,543		23,647	2,000	21,647		53%		58%
2000	16,812	4,000	12,812		25,340	3,500	21,840		51%		59%
2001	12,766	0	12,766		18,772	5,500	13,272		68%		96%

TRAFFIC AND TRANSPORTATION

LOCAL

Page 4.9-2, paragraph 2

Valero and the City of Benicia have formulated the Valero Good Neighbor Agreement, which prohibits truck traffic from using East Second Street from the I-780 freeway.

SETTING

Page 4.9-3, paragraph 2

Add the following sentence at the end of the paragraph:
In accordance with the Valero Good Neighbor Agreement, Valero truck traffic is prohibited from using East Second Street from I-780 to the refinery gate.

B. Less than Significant with Mitigation

Page 4.9-6, delete all text paragraphs and substitute the following text beginning at paragraph 1

The construction of the VCP project could result in a decrease in the LOS to unacceptable levels if it runs concurrently with other construction or maintenance projects. The refinery is concurrently conducting a methyl tertiary butyl ether (MTBE) phase-out project.

Workforce levels for expected and conceivable Valero projects

Per Valero's data response of August 2, 2001, this project is now scheduled to have a peak workforce of 100, rather than 700 as originally stated in the VCP AFC. Valero has also stated that 150 temporary contractors are typically working in the refinery. Therefore, Valero has estimated that a total of 250 contract workers will be involved in refinery activities unrelated to the VCP. When the VCP workforce of 150 is added, the total peak workforce is expected to be 400, as shown below.

Peak workforces for expected Valero Refinery projects

VCP	150
MTBE	100
Temporary contract workers	150
TOTAL	**400**

Valero may also have an unscheduled turnaround (i.e. a shutdown of a major part or all of the refinery for approximately one month in order to commence a repair or maintenance operation). Such a turnaround would most likely occur in the event that a major repair was needed, in that maintenance activities are generally scheduled. Valero has provided a likely estimate turnaround workforce estimate of up to 148-day shift workers, and a worst-case

turnaround workforce estimate of 500-day shift personnel[1]. Historically, a Valero refinery turnaround requiring 500-day shift workers, and 300 on a night shift, has occurred approximately once every two years.

Valero has stated that if a turnaround of this magnitude is needed, that it would transfer 100 of the existing temporary contractor group to the turnaround workforce, leaving the existing contractor group with a total of 50. The peak workforce levels for expected Valero projects + a turnaround group up to 148, are shown below, along with workforce levels resulting from a worst-case turnaround.

Peak workforces for expected Valero Refinery projects

+ a turnaround requiring up to 148 personnel

VCP	150
MTBE	100
Temporary contract workers	150
Turnaround- up to 148	148
TOTAL	**548**

Peak workforces for expected Valero Refinery projects

+ a worst-case turnaround

VCP	150
MTBE	100
Temporary contract workers	50
Turnaround- worst case	500 (day shift)
TOTAL	**800**

MTBE phase-out project traffic

The MTBE phase-out project's traffic will be directed along Park Road, which would result in a reduction in the LOS for some intersections, but these intersections would be maintained at an LOS of D or better. This is not considered significant as the LOS would be maintained at acceptable levels, and a decline in LOS would exist for only six months or less.

VCP + other project traffic

The VCP's greatest traffic impact is on the intersection of Park and Bayshore Roads. The LOS for this intersection could potentially change from a C to a D during the VCP

[1] A major turnaround has the potential to require up to 800 workers altogether, with 500 assigned to a 10-hour day shift from 7:30 a.m. to 6 p.m. The 300 night shift contractors would arrive shortly before their shift begins at 6 p.m.

construction phase. This is an acceptable LOS. However, LOS at this intersection would deteriorate In the event of an unscheduled major turnaround. With estimated 2002 traffic in the critical PM peak period, the Bayshore/Park Road intersection can accommodate 610 (i.e. 300 workers for VCP+ MTBE + existing contractor group + up 310 for turnaround) Valero temporary workers, and maintain an LOS of D maximum. LOS would drop to Level E maximum if Valero had 730 temporary workers, and there were no mitigation measures.

While this LOS E is unacceptable per the City of Benicia traffic LOS standards, actually reaching it appears to be unlikely for the following reasons:

- Day shift turnaround workers would be leaving after the PM peak hour (i.e. they would be working a 10 hour shift from 7:30 a.m. to 6 p.m.);and
- If a major turnaround is needed, Valero will implement traffic impact mitigation measures.

Valero has stated (per 8/14/01 e-mail from Valero's consultant, Lynn McGuire of URS Corporation, to Dan Schiada of the City of Benicia Public Works Department) that in addition to 150 VCP-related workers going through Valero Gate 9, that up to 148 workers involved in a potential turnaround could come from Gate 7 without exceeding the PM peak capacity of the Bayshore/Park Road intersection. The LOS at this intersection could go from a C to a D, which is an acceptable level.

Given the expected Valero temporary project workforce of 400, an additional 148 workers would result in a total of 548. Valero has proposed traffic impact mitigation options involving trigger levels (see the revised Condition of Certification **TRANS-4)**, in the event that a turnaround is needed, and that it would require more than 148 workers. In this event, if the worst case of 500 day shift workers is needed, Valero would transfer 100 of the temporary contractors to the turnaround group, and ensure that the day shift turnaround group departed after the PM peak time.

Given the MTBE phase-out project, and the possibility of a turnaround, the VCP project will need to coordinate its construction activity to minimize peak traffic volume and maintain acceptable LOS for the area roadways and intersections. Valero will need to closely coordinate its activity with the City of Benicia to ensure that any traffic increases remain at levels that are acceptable to the City. Similarly, the applicant will need to closely coordinate its activity with Caltrans. This coordination could include the following mitigation measures:

- Providing someone to direct traffic at the impacted intersections during the peak period when construction traffic is leaving the site;

- Stagger the construction work hours for the different projects to reduce traffic impacts at the PM peak hour;

- Investigate the possibility of changes in signal timing with the City of Benicia's Public Works Department; and

- provide BI-weekly information to the City of Benicia's Public Works Department on expected traffic volume and travel routes.

E. No Impact

Page 4.9-7, delete paragraph 6 and substitute the following paragraph

Given the revised MTBE workforce of 100, with an expected total workforce for all scheduled projects (including VCP workforce of 100) of 400, staff has concluded that LOS will remain at acceptable levels for the affected intersections and the Valero gates. With LOS remaining at acceptable levels, emergency access for fire, police and medical vehicles should be adequate. In order to ensure that this occurs, maintenance of emergency access to the satisfaction of the City, will need to be part of Valero's regularly scheduled discussions with the City Public Works Department as noted in **TRANS-1.** Similarly, Valero will need to work closely with Caltrans to ensure that emergency access is maintained.

F. Less Than Significant with Mitigation Incorporated " to " No Impact"

Page 4.9-8:

Delete paragraphs 2 and 3 and substitute the following text:
Valero has also planned an MTBE phase-out project that will have a construction period concurrent with the VCP construction period. The MTBE phase-out project is expected to have a peak workforce of 100. The MTBE workers will be required to use the parking lot inside of Gate 8 as its primary parking area. If both projects peak at the same time, parking will be required for 250 workers, plus the existing, temporary contractor workforce for a total of 400 spaces.

TRANS Figure 1 shows the Valero refinery gates and capacity of the two parking lots, which are allotted to temporary employees. Staff has focused on the parking areas assigned to temporary employees, since the existing refinery workforce of approximately 300 uses other parking lots which are located in several areas throughout the refinery. The workforces for the VCP and MTBE projects, the existing contractor workforce, and a possible turnaround workforce of 148, are assigned to separate gates and parking lots, as shown below in **TRANS Table 1**.

TRANS Table 1

Valero Refinery Projects – Gate and Parking Lot Assignments and Capacities

Valero project	Number of workers	Gate(s) and Assigned Parking Lot	Parking Lot Capacity
VCP	150	Gate 9 Lot at Gate 9	 350
MTBE	100	Gate 8 Lot at Gate 8	 500
Existing contractor activity/reduced contractor group due to turnaround	150/50	All gates except 4; Lot at Gate 8	

Possible turnaround/worst-case turnaround	Up to 148/ 500 day shift	Gate 7 Lot at Gate 8	
Total Daytime Parking Needed & Available.	548/800		850

Staff has concluded that since the two parking lots (i.e. lots at Gate 8 and Gate 9) allotted to temporary employees have a total capacity of 850 spaces, and the number of total workers is not reasonably expected to exceed 548, that there will be sufficient parking capacity. Valero has further stated that in the event of an turnaround requiring 500 dayshift workers, that it will reduce the number of existing, temporary contractors by 100 to provide additional parking spaces, and schedule most turnaround worker arrivals after the departure of the day shift. When the worst case- turnaround workforce of 500-day shift workers is added, the total peak workforce would be 800. With a combined temporary worker parking lot capacity of 850, in the event of a worst-case turnaround, parking would still be sufficient. Therefore, there is no impact.

CUMULATIVE IMPACTS

Page 4.9-8, delete the existing paragraph and substitute the following paragraph

The construction workforce and truck delivery traffic associated with the VCP, the MTBE phase-out project, and a possible turnaround has the potential to result in an adverse impact for LOS on area roadways. In order to mitigate this potential impact, the construction activity with the two planned projects (i.e. VCP and MTBE phase-out) will need to be coordinated. The resulting traffic levels, and parking availability, need to be monitored closely, and discussed regularly with the City of Benicia's Public Works staff and Caltrans.

The existing parking lot capacity will be sufficient to accommodate the number of temporary employees that can be reasonably expected.

CONCLUSIONS AND RECOMMENDATIONS

Page 4.9-9, delete the existing paragraphs 2,3, and 4, and substitute the following

The project by itself would have minimal impact on the area roadways and intersections. However, when the traffic associated with this project is combined with other projects being considered by the refinery, it may result in a reduction in the LOS for various intersections. Valero will take steps to minimize the flow of traffic during the peak construction period. These steps will include scheduling of construction so that the workforce for the various projects do not peak during the same time period, providing traffic control personnel, and traffic control measures, as needed.

Although there is a minority population greater than 50 percent within six miles of the project site, staff concludes that there are no significant direct or cumulative impacts on the minority population. Therefore, there are no environmental justice issues.

The project owner will need to establish a specific action plan for traffic and transportation to avoid unacceptable LOS at congested intersections, and to follow all LORS acceptable to Caltrans and the City of Benicia for handling hazardous materials.

PROPOSED CONDITIONS OF EXEMPTION

"CHANGE TO" PROPOSED CONDITIONS OF CERTIFICATION

Page 4.9-9-10-11-12

Delete the existing **TRANS-1, TRANS-4, TRANS-5,** and **TRANS-6**.
Substitute the following:

TRANS-1 During construction of the power plant and all related facilities, the project owner shall require on-site construction period parking.

Verification: At least 60 days or a lesser period of time mutually agreed to by the Compliance Manager (CPM) and the project owner, prior to any earth moving or disturbance activity, the project owner shall submit a parking and staging plan for all phases of project construction to the City of Benicia for review and comment, and to the CPM for review and approval.

TRANS-2 and TRANS-3 remain the same.

TRANS-4 The project owner shall develop a traffic control plan and implementation program, (i.e. a specific action plan for traffic and transportation) that will ensure that the existing roadways and intersections continue to operate at a LOS acceptable to the City of Benicia. The project owner shall submit the project traffic control plan to the City of Benicia and Caltrans for review and comments, and to the CPM for review and approval.

The project owner shall on a biweekly basis, monitor the traffic conditions and vehicle counts at the access points to the project site, and at the onsite parking lots for the duration of the construction. The traffic counts for the emergency access routes for fire, police, and medical vehicles will also be reviewed on a biweekly basis.

Results of these traffic counts will be presented to the City Traffic Engineer. Monthly traffic coordination meetings will be held with the project owner, the City Traffic Engineer, and the Police Department Patrol Lieutenant to review the data and to discuss the traffic measures that may be required to mitigate the impacts of the project. The project owner, in conjunction with the City Traffic Engineer, shall establish traffic trigger levels, above which various traffic mitigation measures will be considered and implemented.

Measures to be implemented may include:

- Stagger work hours or work shifts to reduce traffic volumes during the peak traffic periods.
- Provide traffic control personnel at affected intersections or access points to manage traffic during peak periods.
- Provide temporary traffic control measures including signing, striping, and detours.
- Use alternate refinery access points to disperse ingress/egress traffic from the project.
- Provide additional temporary parking for construction workers as needed.
- Require trucks to make deliveries at specified times which avoid the morning and evening peak hour periods, and along designated routes to minimize traffic impacts at congested locations.
- Notify the City of Benicia Public Works staff immediately of any unscheduled turnaround, and related workforce traffic and parking requirements.

Verification: Parking lot vehicle counts, records of all communications with the City of Benicia Traffic Engineer, and records of all steps taken to minimize traffic congestion will be available to the CPM upon request.

REFERENCES

Insert following 3 References

City of Benicia, 2001. Comments on the CEC Staff Assessment of August 2, 2001. August 10.

City of Benicia, 2001. City of Benicia Outstanding Issues Prehearing Conference Statement. August 14.

Lynn McGuire, URS Corp. 2001. E-mail to Dan Schiada, City of Benicia Public Works. August 14.

Sam Hammonds, Valero Corp. 2001. E-mail to Dan Schiada et al. August 16.

TRANSMISSION SYSTEM ENGINEERING

PROJECT DESCRIPTION

Interconnection Facilities and Switchyard

Pages 5.5-3 and 5.5-4, paragraphs 1 & 2

The VCP site will be near the existing 12.5 kV switch house, about 1650 feet apart, within the fenced yard of the VRC. The VCP will consist of two combustion gas turbine generating units (units 1 & 2), 51 MW each, for a total nominal output of 102 MW (VRC 2001a, AFC section 1.1). Each of the new 12.5 kV generating units will terminate in its 3000 ampere 12.5 kV single bus through a 3000 ampere breaker (VRC 2001a, AFC section 2.2, Appendix D). At each of the two generator buses, the outlet, a 3000 KCML directly buried PILC underground cable, about 900 feet long and 2 cables per phase with a normal thermal rating of 65 MVA, will be connected through a 3000 ampere breaker. The underground cables from the power plant switchyards will terminate in a new 12.5 kV powerhouse, adjacent to the existing 12.5 kV switch house. The new 12.5 kV power house will have a 3-section 3000 ampere single bus construction with two 3000 ampere bus section breakers, section 1 will carry the new generating unit 1 underground cable outlet through a 3000 ampere breaker, section 3 will carry the new generating unit 2 underground cable outlet through a 3000 ampere breaker and each of the three bus sections will loop in and out of one of the three existing 12.5 kV overhead lines (between the existing 12.5 kV switch house and the underground cable risers connected to 56 MVA transformer 12.5 kV side breakers at Bahia substation) through 3000 ampere breakers on each side of the bus. This configuration for the new cogen plant interconnection and switchyard will provide the following:

a) To consume directly the power generated by the new cogen units for the refinery load and to transmit the excess cogenerated power to the Cal-ISO 230 kV grid through the three 12.5 kV overhead lines inside the refinery and the three 56 MVA, 230 kV/12.5 kV transformers at PG&E Bahia substation OR.

b) To receive power, per present practice, from the Cal-ISO 230 kV grid through the VRC's three 56 MVA, 230 kV/12.5 kV transformers at PG&E Bahia substation and to transmit the power inside the refinery through the three 12.5 kV ovehead lines for consumption in the refinery load, when there will be no or less cogeneration by the new VCP generators.

This configuration for the cogeneration interconnection and switchyard is in accordance with good industrial and utility practices, and is considered acceptable. All work will be done within the fenced yard of the VRC and PG&E Bahia substation.

SYSTEM ANALYSIS AND IMPACT

Downstream Impacts

Pages 5.5-4 and 5.5-5, Paragraph 2

The preliminary short circuit study performed by the VRC staff indicate that the maximum available fault current in the refinery 12.5 kV system is now 23 kilo-ampere (kA) i.e. 500 MVA and will increase significantly with the addition of the new generators. A final short circuit study will be performed during the detailed engineering for the project (VRC 2001c, AFC supplemental II). To limit the available fault current in the 12.5 kV system with the addition of the new generators to 32 kA (692 MVA), the VRC has proposed to install several current limiting devices in the proposed 12.5 kV interconnection facilities for the new generators and to trigger sectionalizing schemes in the 12.5 kV system in the event of a fault. These mitigation measures will allow the 12.5 kV equipment to withstand the increased fault current due to the addition of the new generators. All work will be done within the fenced lines of the VRC and would not cause any significant environmental impacts.

Scope of Reliability Impact Studies

Page 5.5-5, Paragraph 1

A Generator Transmission Interconnection study (GTIS), a 7 day study per Executive Order D-26-01, was initially performed by PG&E (VRC, 2001b) and additional GTIS was performed by PG&E (VRC, 2001c) to determine system impacts, and identify downstream facilities and mitigation measures in the PG&E 230 kV bulk power and 115 kV system due to the addition of two new 51 MW VCP units to 12.5 kV buses at Bahia 230 kV substation. The studies were performed with 2002 summer peak and off-peak computer model cases (VRC 2001b,c & d, AFC supplemental I, II & III).

SYSTEM RELIABILITY IMPACT STUDY RESULTS

Power Flow Study Results

Page 5.5-6, Paragraph 5

According to the recent Facilities Cost study (VRC 2001d, AFC supplemental III), under steady state condition there will be no criteria violations in the PG&E bulk power system for the critical single and double contingencies.

Transient Stability Study Results

Page 5.5-6, Paragraph 1

With the Valero Refinery load modeled as an equivalent induction motor, transient stability studies (VRC 2001d, AFC supplemental III) were performed for critical single and double contingency cases in the PG&E transmission system. The results indicate that the Valero Cogen project would have no adverse impact on the stable operation of the transmission system following the selected disturbances.

Short Circuit Study Results

Page 5.5-6, Paragraph 2

The preliminary short circuit study performed by the VRC staff indicate the maximum available fault current in the refinery 12.5 kV system is now 23 kilo-ampere (kA) i.e. 500 MVA and will increase significantly with the addition of the new generators. To limit the available fault current with the addition of the new generators to 32 kA (692 MVA), the VRC has proposed to install several current limiting devices in the proposed 12.5 kV interconnection facilities for the new generators and to trigger sectionalizing schemes in the 12.5 kV system in the event of a fault. These mitigation measures will allow the 12.5 kV equipment to withstand the increased fault current due to the addition of the new generators.

Conclusions

Pages 5.5-6 and 5.5-7, Paragraph 1

The system reliability impact study indicate that addition of the 102 MW of the Valero Cogen plant will have no adverse reliability impact on the PG&E bulk power system and therefore, do not call for any mitigation measures. No new downstream facilities are required for the interconnection to meet NERC, WSCC and Cal-ISO reliability criteria.

CONDITIONS OF CERTIFICATION

Page 5.5-9, Paragraph 2

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for equipment (see a list of major equipment in **Table 1: Major Equipment** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment

DESCRIPTION
Breakers
Power House 12.5 kV
Switchyards 12.5 kV & Enclosures
Buses
Underground cables
Overhead lines
Others

Page 5.5-13, Paragraph 1

TSE-8 The project owner shall provide the following Notice to the California Independent System Operator (Cal-ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one (1) week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and

2. At least one (1) business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 to 1530 at (916)-351-2300.

REFERENCES

Page 5.5-14, Added

VRC (Valero Refining Company-California) 2001d– Application for Certification, Supplemental III, Valero Cogeneration Project (01-AFC-5). Submitted to the California Energy Commission on August 14, 2001.

VISUAL RESOURCES

COMPLIANCE WITH LORS

Page 4.10-10, Table 3

Table 3 - Proposed Project's Consistency with Local LORS Applicable to Visual Resources:

City of Benicia General Plan and Municipal Code

LORS		Consistency Determination Before Mitigation	Basis for Consistency
General Plan/ Municipal Code Section	**Goal Descriptions**		
Visual Character Section / General Plan	Goal 3.12. • Improve the appearance of the Industrial Park. • Encourage additional attractive, quality development.	YES	While the proposed project would not specifically improve the appearance of the Industrial Park, it would generally appear consistent with other on-site and nearby industrial facilities. Not applicable
	Goal 3.9. • Protect and enhance scenic roads and highways Preserve vistas along SR-780 and SR-680.	Yes	The project would not be visible from either SR-708 or SR-680 and thus would not degrade the scenic nature of the vistas.
Section 17.32.030/ 17.108 Municipal Code	Property Development Regulations Structure Design Review	Yes	The Energy Commission's power plant certification process, including the conditions of certification, incorporates the property development regulations and design review guidelines covered by these ordinances and codes.