

Staff Assessment

**CALIFORNIA  
ENERGY  
COMMISSION**

# **MOUNTAINVIEW POWER PLANT PROJECT**

Application For Certification 00-AFC-2  
City of Redlands, San Bernardino County

**STAFF REPORT**

OCTOBER 2000  
(00-AFC-2)



Gray Davis, Governor

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OCTOBER 2000  
(00-AFC-3)



Gray Davis, Governor

## **CALIFORNIA ENERGY COMMISSION**

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## EXECUTIVE SUMMARY

On February 1, 2000, Mountainview Power Company, Limited Liability Company (the applicant) filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate a 1,056 megawatt (MW) natural gas-fired, combined-cycle power generating facility. On May 17, 2000, the California Energy Commission found the AFC to be data adequate.

The applicant intends to locate the project on a 54.3-acre site at the northeast corner of San Bernardino Avenue and Mountain View Avenue in Section 18, Township 1 South, Range 3 West, in an incorporated section of San Bernardino County. The power plant site has been annexed by the City of Redlands.

See **Project Description Figure 1**.

The Mountainview Power Plant Project (MVPP) and related facilities such as the electric transmission lines, natural gas line, water supply lines and wastewater lines are under the Energy Commission jurisdiction (Public Resources Code (PRC) §§ 25500 et seq.). When issuing a license, the Energy Commission acts as lead state agency (PRC § 25519(c)) under the California Environmental Quality Act (PRC §§ 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (PRC § 21080.5).

The primary responsibility of the California Energy Commission staff is to provide an independent assessment of the project's potentially significant effects on the environment, the public's health and safety, conformance with all applicable laws, ordinances, regulations and standards (LORS), and measures to mitigate any identified potential effects. The South Coast Air Quality Management District provided its preliminary Determination of Compliance with District rules and regulations, and staff has incorporated it into the Air Quality section. Energy Commission staff have completed this Staff Assessment (SA) and, after workshops and hearings on this document, a Presiding Member's Proposed Decision (PMPD) will be completed. The SA is staff's independent assessment and recommendation to the Commissioners of the California Energy Commission, the decision-makers in this proceeding.

During evidentiary hearings, the Energy Commission Committee assigned to the MVPP proceedings will consider and weigh the testimony and recommendations of all interested parties, including Energy Commission staff, the applicant, intervenors, public, City of Redlands, and other local, state and federal agencies, before making the final decision. The analyses contained in this document were prepared in accordance with PRC §§ 25500 et seq.; the California Code of Regulations (CCR) Title 20, §§ 12001 et seq.; and the California Environmental Quality Act (PRC §§ 21000 et seq.) and its guidelines (CCR title 14 §§ 15000 et seq.).

## PROJECT DESCRIPTION

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The Mountainview Power Plant Project will be a nominal 1,056-megawatt (MW), natural gas-fired combined cycle power plant. Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity will differ from, and likely exceed, this figure. The main power facilities for the project will occupy about 16.3 acres and contain the power-island, administrative buildings, chemical storage areas, cooling towers and other support facilities.

New connections to the existing adjacent SCE-owned 230 kilovolt (kV) switchyard will be added as part of the proposed project. No new transmission lines will be built.

Natural gas will be supplied to the project via a new pipeline approximately 17 miles long. **Project Description Figure 5** shows the connecting line. The 17-mile pipeline will connect to a Southern California Gas facility in the city of Rancho Cucamonga.

Water requirements for the project are 4,665 gallons per minute at full operation and will be supplied from a combination of sources. A minimum of 50% of requirements will be supplied through the use of secondary effluent from the City of Redlands Waste Water Treatment Plant (WWTP). The other water supply sources for the plant will be onsite groundwater derived from two existing wells located on the property site and from 2 new wells to be drilled on site that will draw TCE contaminated water from the middle aquifer. The applicant has agreed not to use the high quality, lower aquifer water in excess of their current usage, except in emergency. Mountainview Power proposes to install approximately 2.3 miles of new reclaimed water supply pipeline for transport of the secondary effluent. The applicant is proposing a wet cooling system. **Project Description Figure 5**

Wastewater discharge will be sent through an existing 12-inch water pipeline and a proposed 1,100 foot connector to the Santa Ana Regional Interceptor (SARI) discharge line. **Project Description Figure 5.**

The project is estimated to have a capital cost of approximately \$550 million. If approved, construction of the MVPP, from site preparation to commercial operation is expected to take approximately 19 months. The applicant plans to complete construction and start operation of the combined-cycle unit in 2002. During construction, up to approximately 568 construction jobs will be created over the 19-month construction schedule. A permanent professional workforce of approximately 33 people will operate the plant.

## **PUBLIC AND AGENCY COORDINATION**

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The Mountainview Power Plant Project is proposed on land currently zoned for industrial uses and is the site of an existing power plant. The power plant site is currently in the process of being annexed by the City of Redlands.

Extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with the County of San Bernardino, California Independent System Operator (Cal-ISO), South Coast Air Quality Management District, California Air Resources Board, and U.S. Environmental Protection Agency to identify and resolve issues of concern. In addition, we have coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, U.S. Army Corp of Engineers, intervenors, and interested residents of the community. The staff worked in concert with various water agencies to ensure minimization of water usage and impacts.

A series of publicly noticed workshops and hearings will be conducted on this document during October and November. Information gathered during these workshops and hearings will be used to prepare the Presiding Member's Proposed Decision (PMPD). Additionally, written comments on the SA will be included in the PMPD.

## **CONCLUSIONS AND RECOMMENDATIONS**

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The SA is a document of the Energy Commission staff so, by its very nature, the conclusions and recommendations presented are considered staff's testimony.

Each technical area assessment in the SA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS); whether the facility can be constructed and operated safely and reliably; project specific and cumulative impacts; the environmental consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated, should it be approved.

In summary this SA finds that:

- The project is in conformance with all Laws, Ordinances, Regulations and Standards (LORS).
- With the proposed conditions of certification included in the various technical areas, the project's construction and operation impacts can be mitigated to a level less than significant.
- The South Coast Air Quality Management District believes that the project complies with the appropriate rules and requirements of the District and will not contribute to the degradation of the air quality in the South Coast Air Quality Management District.



MOUNTAINVIEW POWER PLANT PROJECT  
STAFF ASSESSMENT  
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# INTRODUCTION

On February 1, 2000, Mountainview Power Company, Limited Liability Company (the applicant) filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate a 1,056 megawatt (MW) natural gas-fired, combined-cycle power generating facility. On May 17, 2000, the California Energy Commission found the AFC to be data adequate. A finding of data adequacy by the Commission begins staff's analysis of the project.

The Staff Assessment (SA) presents the Energy Commission staff's independent analysis of Mountainview Power Company LLC's AFC for the Mountainview Power Plant Project (MVPP). The air quality chapter incorporates the South Coast Air Quality Management District's preliminary Determination of Compliance with rules and regulations of the District. The SA is prepared pursuant to Title 20, California Code of Regulations, §1742, 1742.5, 1743 and 1744. The SA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision.

## ORGANIZATION OF THE REPORT

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The SA describes the following:

- the proposed project;
- the existing environmental setting;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
- the environmental consequences of the project including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors that may lessen or eliminate potential direct and cumulative impacts;
- proposed conditions under which the project should be constructed, operated and closed, if it is certified; and
- project alternatives.

The analyses contained in this SA are based upon information from: 1) the AFC; 2) supplements to the AFC; 3) responses to data requests; 4) information from local and state agencies; 5) concerned citizens; 6) existing documents and publications; and 7) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements. The SA presents conclusions

and proposed conditions of certification that would apply to the design, construction, operation and closure of the proposed facility.

The SA contains an Executive Summary, Introduction, Project Description, and Project Alternatives. The environmental, engineering, and public health and safety analysis of the proposed project is contained in 19 technical areas. Each technical area is included in a separate chapter and are as follows: air quality, biological resources, cultural resources, facility design, geology (including geologic hazards, surface water hydrology, paleontological resources, geological resources), hazardous material management, land use, noise, power plant efficiency, power plant reliability, public health, socioeconomics, traffic and transportation, transmission line safety, transmission system engineering, visual resources, waste management, water resources, worker safety and fire protection. These chapters each contain a discussion of facility closure, project construction and operation compliance monitoring plans, and a list of staff that assisted in preparing this report.

Each of the 19 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable).

## **ENERGY COMMISSION SITING PROCESS**

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The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Public Resources Code (PRC), §25500). The Energy Commission must review AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (PRC §25519), and compliance with applicable governmental laws or standards (PRC, §25523 (d)).

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts contained is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, §1742 and 1742.5(a)).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, §1743(b)). Staff is required to develop a compliance plan (coordinated with

other agencies) to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, §1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act (CEQA). An Environmental Impact Report (EIR) is not required as the Energy Commission's site certification program has been certified by the Resources Agency (PRC, §21080.5 and Cal. Code Regs. tit. 14, §15251 (k)). The Energy Commission acts in the role of the CEQA lead agency.

The staff has prepared this SA that presents for the Committee, applicant, intervenors, agencies, other interested parties and members of the public, the staff's analysis, conclusions, and recommendations. The committee will conduct a series of workshops in San Bernardino and Sacramento to discuss the findings, proposed mitigation, and proposed compliance monitoring requirements.

Based on the workshops and written comments, staff will refine their analysis, correct errors, and finalize conditions of certification to reflect areas where we have reached agreement with the parties. Responses to written comments on the SA will be included in the Presiding Member's Proposed Decision (PMPD). The SA serves as staff's testimony on a proposal.

Staff's assessment is only one piece of evidence that will be considered by the Committee (two commissioners who have been assigned to this project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public evidentiary hearings, all parties will be afforded an opportunity to present evidence, cross examine witnesses, and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is distributed in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD is required to undergo a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any party may appeal the decision to the Energy Commission.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the SA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. The proposed Compliance Monitoring Plan and General Conditions are included at the end of the SA.

## **PUBLIC AND AGENCY COORDINATION**

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The Mountainview Power Plant Project is proposed on land currently zoned for a power plant. Publicly noticed workshops on air quality, water resources, biological resources, cultural resources, traffic and transportation have been held in both San Bernardino and Sacramento. These workshops have been highly productive.

In addition to these workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with the City of Redlands, County of San Bernardino, California Independent System Operator (Cal-ISO), South Coast Air Quality Management District, California Air Resources Board, FAA, U.S. Environmental Protection Agency, and the Regional Water Quality Control Board to identify and resolve issues of concern. In addition we have coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, U.S. Army Corp of Engineers, intervenors, and the interested residents of the community.

# PROJECT DESCRIPTION

James W. Reede, Jr.

## NATURE AND PURPOSE OF THE PROJECT

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Mountainview Power Company LLC (referred to as either "Mountainview Power," MVPC or the "applicant") proposes to construct and operate the Mountainview Power Plant Project (MVPP). The applicant's objective is "to provide an efficient and reliable source of electric generation to the Southern California area at energy rates that are competitive with other sources of electric generation at the least practicable cost and impact to the environment."

## PROJECT LOCATION

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The applicant intends to locate the project on a 16.3-acre site at the northeast corner of San Bernardino Avenue and Mountain View Avenue in Section 18, Township 1 South, Range 3 West, in an unincorporated section of San Bernardino County. The power plant site is currently in the process of being annexed by the City of Redlands. Negotiations are currently underway to purchase from SCE an additional 38 acres immediately west, northwest and north of the project site. See **Project Description Figure 1**.

## POWER PLANT

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The Mountainview Power Plant Project will be a nominal 1,056-megawatt (MW), natural gas-fired combined cycle power plant. Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity will differ from, and likely exceed, this figure. The main power facilities for the project will occupy about 16.3 acres and contain the power island, administrative buildings, chemical storage areas, cooling towers and other support facilities.

The power island will consist of four advanced design gas fired General Electric 7FA gas turbine-generators, each equipped with a Heat Recovery Steam Generator (HRSG) with duct burners, evaporative coolers, SCR systems and low-NOx burners for NOx control, oxidation catalyst systems for CO and VOC control; two existing single condensing steam turbine-generators; surface condensers; wet mechanical draft cooling towers; wastewater treatment; water treatment system; and associated balance of plant equipment.

Each HSRG will be equipped with a 200-foot exhaust stack with the exhaust stacks of each pair of HRSGs ducted together into a single exhaust stack. The existing 130-foot stacks for Units 1 and 2 will remain as-is.

An aerial view of the plant layout **Project Description Figure 2** shows the existing power plant site and electrical substation. The rendering in **Project Description**

**Figure 3** provides a view of how the plant will look on the site. **Project Description Figure 4** shows elevations of the power plant facilities.

## TRANSMISSION LINE FACILITIES

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New connections to the existing adjacent SCE-owned 230 kilovolt (kV) switchyard will be added as part of the proposed project. No new transmission lines will be built, as the existing 230 kV transmission lines connected to the adjacent San Bernardino Substation are capable of handling the proposed and existing power generation.

## NATURAL GAS PIPELINE

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Natural gas will be supplied to the project via a new 24 to 30-inch pipeline approximately 17 miles long. **Project Description Figure 5** shows the connecting line. The 17-mile pipeline will be laid entirely within existing right-of-ways of city streets originating at a Southern California Gas facility in the city of Rancho Cucamonga.

## WATER SUPPLY AND WASTE WATER TREATMENT

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Water requirements for the project are 4,665 gallons per minute at full operation and will be supplied from a combination of sources. A minimum of 50% of requirements will be supplied through the use of secondary effluent from the City of Redlands Waste Water Treatment Plant (WWTP). The other water supply sources for the plant will be onsite groundwater derived from two existing wells located on the property site and from 2 new wells to be drilled on-site that will draw TCE contaminated water from the middle aquifer.

The applicant has agreed not to use the high quality, lower aquifer water in excess of their current usage, except in emergency. Mountainview Power proposes to install approximately 2.3 miles of new reclaimed water supply pipeline for transport of the secondary effluent. The applicant is proposing a wet cooling system.

**Project Description Figure 5**

Wastewater discharge will be sent to through an existing 12-inch water pipeline and a proposed 1,100-foot connector to the Santa Ana Regional Interceptor (SARI) discharge line. **Project Description Figure 5.**

## CONSTRUCTION AND OPERATION

---

The project is estimated to have a capital cost of approximately \$550 million. The applicant plans to complete construction and start operation of the combined-cycle unit in 2003. During construction, up to approximately 568 construction jobs will be created over the 19-month construction schedule. A permanent professional workforce of approximately 33 people will operate the plant.

**Project Description Figure 4** shows the laydown area to be used during on-site construction. The applicant plans to begin construction immediately after certification, which is expected to occur in late January 2001. The applicant projects a 19-month construction schedule. This would lead to commercial operation by late fall or winter 2002.



# AIR QUALITY

Joseph M. Loyer

## INTRODUCTION

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This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the planned construction and operation of the Mountainview Power Plant (MVPP) as proposed by the Mountainview Power Company, LLC (MVPC). 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 (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM<sub>10</sub>).

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

- whether the MVPP is likely to conform with applicable Federal, State and South Coast 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 MVPP is 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 MVPP is 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)

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### 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 analysis has been delegated by the Environmental Protection Agency (EPA) to the South Coast Air Quality Management District (District). The EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

## **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 considerable 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 - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

The proposed project is subject to the following South Coast Air Quality Management District rules and regulations:

### ***REGULATION II – PERMITS***

This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment.

#### **RULE 202 – TEMPORARY PERMIT TO OPERATE**

This rule states that any new equipment that has been issued a Permit to Construct (PTC) shall be allowed to use that PTC as a temporary Permit to Operate (PTO) upon notification to the Air Pollution Control Officer (APCO).

#### **RULE 203 – PERMIT TO OPERATE**

This rule prohibits the use of any equipment that may emit air contaminants or control the emission of air contaminants, without first obtaining a PTO except as provided in Rule 202.

#### **RULE 217 – PROVISIONS FOR SAMPLING AND TESTING**

The Executive Officer (EO) may require the applicant to provide and maintain facilities necessary for sampling and testing. The EO will inform the applicant of the need for testing ports, platforms and utilities.

#### **RULE 218 – CONTINUOUS EMISSION MONITORING**

This rule describes the installation, QA/QC and reporting requirements for all sampling interfaces, analyzers and data acquisition systems used to continuously determine the concentration or mass emission of an emission source. However, this rule does not apply to the CEMS required for NO<sub>x</sub> monitoring under RECLAIM (Regulation XX).

### ***REGULATION IV – PROHIBITIONS***

This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events. Please note that San Bernardino County Rule 53 and 53A have not been superseded by District rules and may apply to this project.

#### **RULE 401 – VISIBLE EMISSIONS**

Generally this rule restricts visible emissions from a single source for more than three minutes in any one hour from being as dark or darker than that designated on the No. 1 Ringelman Chart (US Bureau of Mines).

#### **RULE 402 – NUISANCE**

This rule restricts the discharge of any contaminant in quantities which cause or have a natural ability to cause injury, damage, nuisance or annoyance to businesses, property or the public.

#### **RULE 403 – FUGITIVE DUST**

This rule requires that the applicant prevent, reduce or mitigate fugitive dust emissions from the project site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM<sub>10</sub> emissions (between up and down wind measurements) to less than 50 ug/m<sup>3</sup> and restricts the tracking out of bulk materials onto public roads. Additionally, the applicant must utilize one or more of the best available control measures (identified in the tables within the rule). Mitigation measures may include, adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities. Finally, a contingency plan maybe required if so determined by the US EPA.

#### **RULE 407 – LIQUID AND GASEOUS AIR CONTAMINANTS**

This rule limits CO emissions to 2,000 ppm and SO<sub>2</sub> emissions to 500 ppm, averaged over 15 minutes. However, internal combustion engines are exempt from the SO<sub>2</sub> limit, as are equipment that comply with rule 431.1. The applicant will comply with rule 431.1 and thus the sulfur limit of rule 407 will not apply.

#### **RULE 408 – CIRCUMVENTION**

This rule allows the concealment of emissions released to the atmosphere in cases where the only violation involved is of Section 48700 of the Health and Safety Code or District Rule 402.

#### **RULE 409 – COMBUSTION CONTAMINANTS**

This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter of gas, calculated to 12% CO<sub>2</sub>, averaged over 15 minutes. This rule does not apply to IC engines or jet engine test stands.

#### **RULE 431.1 – SULFUR CONTENT OF GASEOUS FUELS**

This rule restricts the sale or use of gaseous fuels that exceed a sulfur content limit. The sulfur content limit for natural gas is 16 ppmv calculated as H<sub>2</sub>S. This rule also establishes monitoring and reporting requirements, as well as test methods to be used.

#### **RULE 431.2 – SULFUR CONTENT OF LIQUID FUELS**

This rule establishes a sulfur content limit for diesel fuel of 0.05% by weight, as well as, record keeping requirements and test methods.

#### **RULE 475 – ELECTRIC POWER GENERATING EQUIPMENT**

This rule limits combustion contaminants (PM10) from electric power generating equipment to 11 pounds per hour and 23 milligrams per cubic meter @ 3% O<sub>2</sub> (averaging time subject to Executive Officer decision).

### ***REGULATION VII – EMERGENCIES***

#### **RULE 701 – AIR POLLUTION EMERGENCY CONTINGENCY ACTIONS**

This rule requires that facilities employing 100 or more people or emitting 100 or more tons of pollutants (NO<sub>x</sub>, SO<sub>x</sub> or VOC) per year, upon declaration or prediction of a Stage 2 or 3 episode, reduce NO<sub>x</sub>, SO<sub>x</sub> and VOC emissions by at least 20% of normal workday operations. This rule also requires that upon declaration of a state of emergency by the Governor, that the facility comply with the Governor's requirements. A power plant facility may be exempt from Rule 701 if they are determined to be an essential service responding to a public emergency or utility outage.

### ***REGULATION IX – STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES***

Regulation IX incorporates provisions of Part 60, Chapter I, Title 40, of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO<sub>2</sub> and NO<sub>2</sub> emissions from the facility as well as monitoring and test method requirements.

### ***REGULATION XI – SOURCE SPECIFIC STANDARDS***

#### **RULE 1110.1 – EMISSIONS FROM STATIONARY INTERNAL COMBUSTION ENGINES**

This rule generally applies to engines larger than 50 brake horsepower (bhp) and places restriction on rich-burn or lean-burn engines. These restrictions are in the form of NO<sub>x</sub> and CO emission limits and the required submittal of a control plan to demonstrate compliance. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.1.

#### **RULE 1110.2 – EMISSIONS FROM GAS AND LIQUID FUELED ENGINES**

This rule establishes NO<sub>x</sub>, VOC and CO emissions limits for stationary and portable engines over 50 bhp in rated capacity. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.2.

### ***REGULATION XIII – NEW SOURCE REVIEW***

This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of non-attainment contaminants and their precursors as well as ozone depleting compounds (ODC) and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NOx or SOx emissions, which are regulated by Regulation XX (RECLAIM).

### ***REGULATION XVII – PREVENTION OF SIGNIFICANT DETERIORATION***

This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. It is likely that the MVPP will trigger PSD for NOx only.

### ***REGULATION XX – REGIONAL CLEAN AIR INCENTIVES MARKET (RECLAIM)***

The Regional Clean Air Incentives Market (RECLAIM) is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces their allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other district rules, where there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is established in Rule 2007. The MVPP is exempt from the SOx RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NOx RECLAIM project and therefore subject to the rules of RECLAIM for NOx emissions.

### ***REGULATION XXX – TITLE V PERMITS***

The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without the other.

## ***REGULATION XXXI – ACID RAIN PERMITS***

Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SO<sub>x</sub> emissions as well as monitoring SO<sub>x</sub>, NO<sub>x</sub> and CO<sub>2</sub> emissions from the facility.

## **LOCAL - SAN BERNARDINO COUNTY**

At this time it is unclear what agency will be enforcing these rules, the District or the County.

### ***RULE 53 – SPECIFIC CONTAMINANTS***

This rule restricts the emission of sulfur to 0.1% by volume and combustion contaminants to 0.3 grain per cubic foot at 12% CO<sub>2</sub>. This rule also restricts the emissions of fluorine to less than that which would cause injury to the property of others.

### ***RULE 53A – SPECIFIC CONTAMINANTS***

This rule restricts the emission of SO<sub>2</sub> to 500 ppm at 12% CO<sub>2</sub>, combustion contaminants to 0.1 grains per cubic foot at 12% CO<sub>2</sub> and several other non-criteria pollutants.

## **ENVIRONMENTAL SETTING**

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### **METEOROLOGICAL CONDITIONS**

The general climate of California is typically dominated by the eastern Pacific high pressure system centered off the coast of California. In the summer, this system results in low inversion layers and clear skies inland and typically early morning fog by the coast. In winter, this system promotes wind and rain storms originating in the Gulf of Alaska and striking Northern California.

The large scale wind flow patterns in the South Coast basin are a diurnal cycle driven by the differences in temperature between the land and the ocean as well as the mountainous terrain surrounding the basin. The Tehachapi and Temblor Mountains separate the South Coast and San Joaquin Valley air basins. The San Bernardino, San Gabriel and Santa Rosa mountains generally make up the eastern mountain range of the South Coast air basin. The Santa Monica and Santa Ana Mountains make up the northern and southern (respectively) coastal mountain ranges of the South Coast air basin.

The project site is located in the City of Redlands, in San Bernardino County. The project site is at an elevation of approximately 1,100 feet above sea level. To the west of the project site, the terrain is generally flat, to east the terrain slopes upward, reaching 1,600 feet approximately 6 miles from the project. The Box Spring Mountains are approximately 2.5 miles south of the project site, raising to

approximately 2,000 feet within 8 miles of the project site. The local mountain ranges nearest the project site are the San Gabriel Mountains (north-west of the project site), the San Bernardino Mountains (north-east), the Jurupa Mountains (south-west) and the Box Spring Mountains (south). The San Bernardino National Forest (a class 1 area) is approximately 5½ miles to the northeast of the project site.

Wind patterns in the San Bernardino area are typically from the west and west-northwest direction. The strongest winds range between 7 and 10 knots and almost 16% of the winds are calm. Temperatures range from the low 40°F to the mid 90°F. The inversion layer within the San Bernardino area of the South Coast basin is typically low, 70-90 meters in fall and winter, 255 meters in the spring and 150 meters in the summer. Such low inversion layers can contribute significantly to severe air quality impacts. Such impacts are typical for this area.

## **EXISTING 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 EPA. 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 ( $\text{mg}/\text{m}^3$  and  $\mu\text{g}/\text{m}^3$ ).

In general, an area is designated as attainment for a specific pollutant if the 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.

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

<b>Pollutant</b>	<b>Averaging Time</b>	<b>Federal Standard</b>	<b>California Standard</b>
Ozone (O <sub>3</sub> )	1 Hour	0.12 ppm (235 µg/m <sup>3</sup> )	0.09 ppm (180 µg/m <sup>3</sup> )
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1 Hour	35 ppm (40 mg/m <sup>3</sup> )	20 ppm (23 mg/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	---
	1 Hour	---	0.25 ppm (470 µg/m <sup>3</sup> )
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	80 µg/m <sup>3</sup> (0.03 ppm)	---
	24 Hour	365 µg/m <sup>3</sup> (0.14 ppm)	0.04 ppm (105 µg/m <sup>3</sup> )
	3 Hour	1300 µg/m <sup>3</sup> (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 µg/m <sup>3</sup> )
Respirable Particulate Matter (PM <sub>10</sub> )	Annual Geometric Mean	---	30 µg/m <sup>3</sup>
	24 Hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	Annual Arithmetic Mean	50 µg/m <sup>3</sup>	---
Sulfates (SO <sub>4</sub> )	24 Hour	---	25 µg/m <sup>3</sup>
Lead	30 Day Average	---	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	---
Hydrogen Sulfide (H <sub>2</sub> S)	1 Hour	---	0.03 ppm (42 µg/m <sup>3</sup> )
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 µg/m <sup>3</sup> )
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.

The MVPP is located in San Bernardino County and is under the jurisdiction of the South Coast Air Quality Management District (District). AIR QUALITY Table 2 shows the attainment or non-attainment status of the District for each criteria pollutant for both the federal and state ambient air quality standards. The federal classifications go from moderate to extreme.

**AIR QUALITY Table 2**  
**Attainment ~ Non-Attainment Classification**  
**South Coast Air Quality Management District**

<b>Pollutants</b>	<b>Federal Classification</b>	<b>State Classification</b>
Ozone	Extreme Non-Attainment	Non-Attainment
PM10	Non-Attainment <sup>1</sup>	Non-Attainment
CO	Serious Non-Attainment	Attainment
NO <sub>2</sub>	Attainment	Attainment
SO <sub>2</sub>	Attainment	Attainment
1 The San Bernardino County area has been designated a Non-Attainment area for the federal PM10 ambient air quality standard, not the entire South Coast air basin.		

## **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 (NO<sub>x</sub>) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The District is designated extreme non-attainment for ozone, meaning that the South Coast air basin ambient ozone concentration is 0.280 ppm or above and it will take longer than 17 years (from 1990) to reach attainment. Attaining the federal ozone ambient air quality standard is typically planned for by controlling the ozone precursors NO<sub>2</sub> and VOC. The 1997 Ozone State Implementation Plan for the South Coast Air Basin (SCAQMD 1999) relies on the California Air Resource Board (CARB) to control mobile sources, the US Environmental Protection Agency (US EPA) to control emission sources under federal jurisdiction and SCAQMD to control local industrial sources (essentially through RECLAIM). Through these control measures, California and SCAQMD are required to reach attainment of the federal ozone ambient air quality standard by 2010.

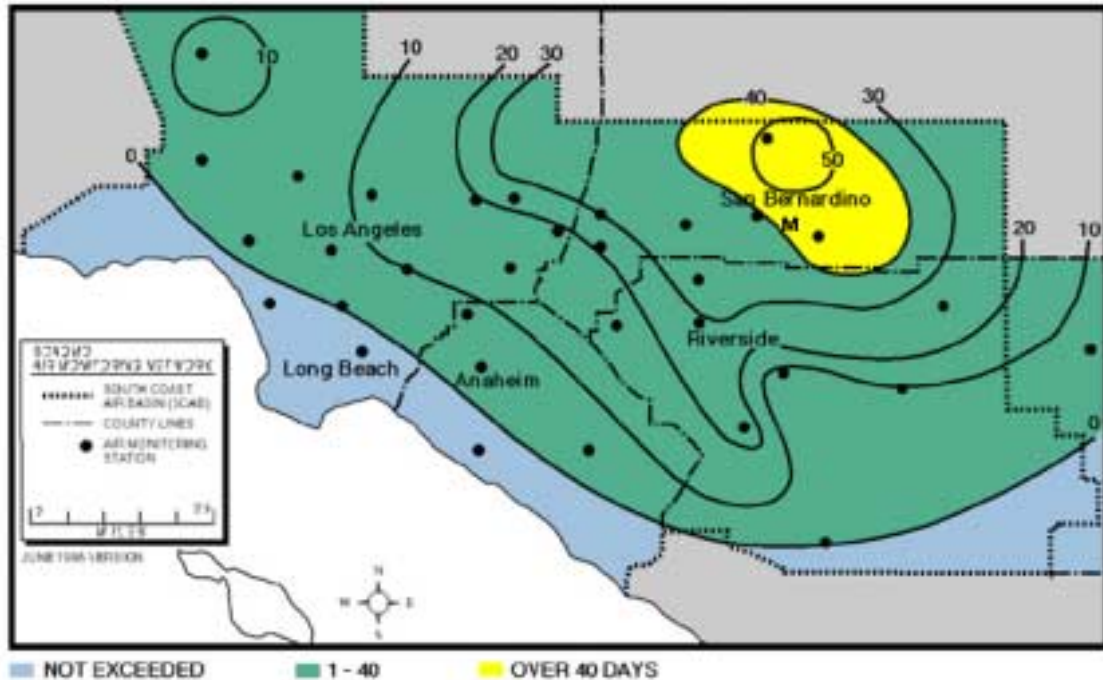
Exceedences of the national (and state) ozone ambient air quality standards occur for both the 1-hour are centered in the San Bernardino area (see AIR QUALITY Figure 1). In 1998, the South Coast air basin experienced more exceedences of the federal ozone standards than anywhere else in the United States. As AIR QUALITY Figure 1 shows, the highest number of exceedences of the federal ozone standards in 1998 occurred in the Central San Bernardino Mountains. This is also the location of the highest recorded measurement of ozone (0.24 ppm). The approximate location of the project site is indicated in AIR QUALITY Figure 1 with an **M**.

The 1999 statistics show a very similar trend, the Central San Bernardino Mountains lead the South Coast air basin in number of violations and highest ozone measurements. In 1999, there were 30 violations of the national 1-hour ozone standard and 93 violations of the state 1-hour ozone standard with the highest 1-hour measurement of ozone being 0.17 ppm.

# AIR QUALITY Figure 1

## OZONE – 1998

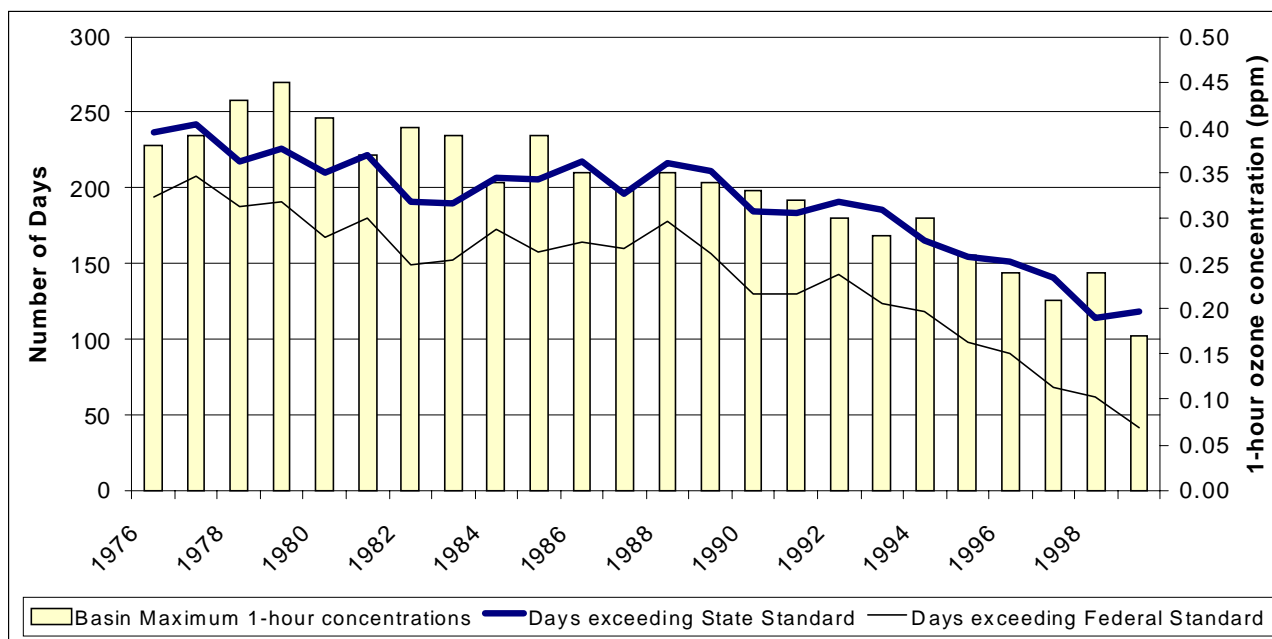
### Number of Days Exceeding the Federal Standard (1-hour average > 0.12 ppm)



Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

Though there are a significant number of exceedences of the ozone ambient air quality standards, it is important to consider the improvements that have occurred in recent years. The SCAQMD leads the nation in air quality management methods and regulatory programs. These programs have significantly improved the air quality in spite of the growing population and industrial and commercial enterprises. AIR QUALITY Figure 2 shows the improvements in exceedences of the federal and state 1-hour ozone standards and maximum annual ozone concentrations over the past 20 years in the South Coast air basin.

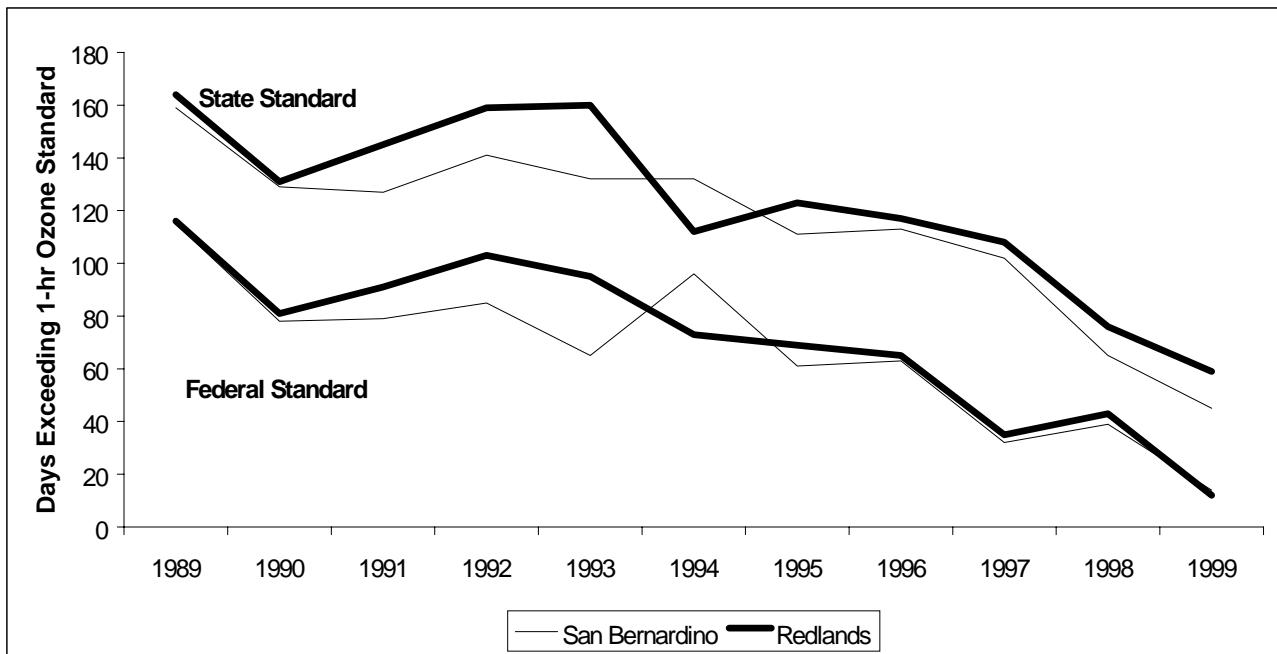
**AIR QUALITY Figure 2**  
**Historic Ozone Air Quality Trends of the South Coast Air Basin**  
**1976 to 1999**



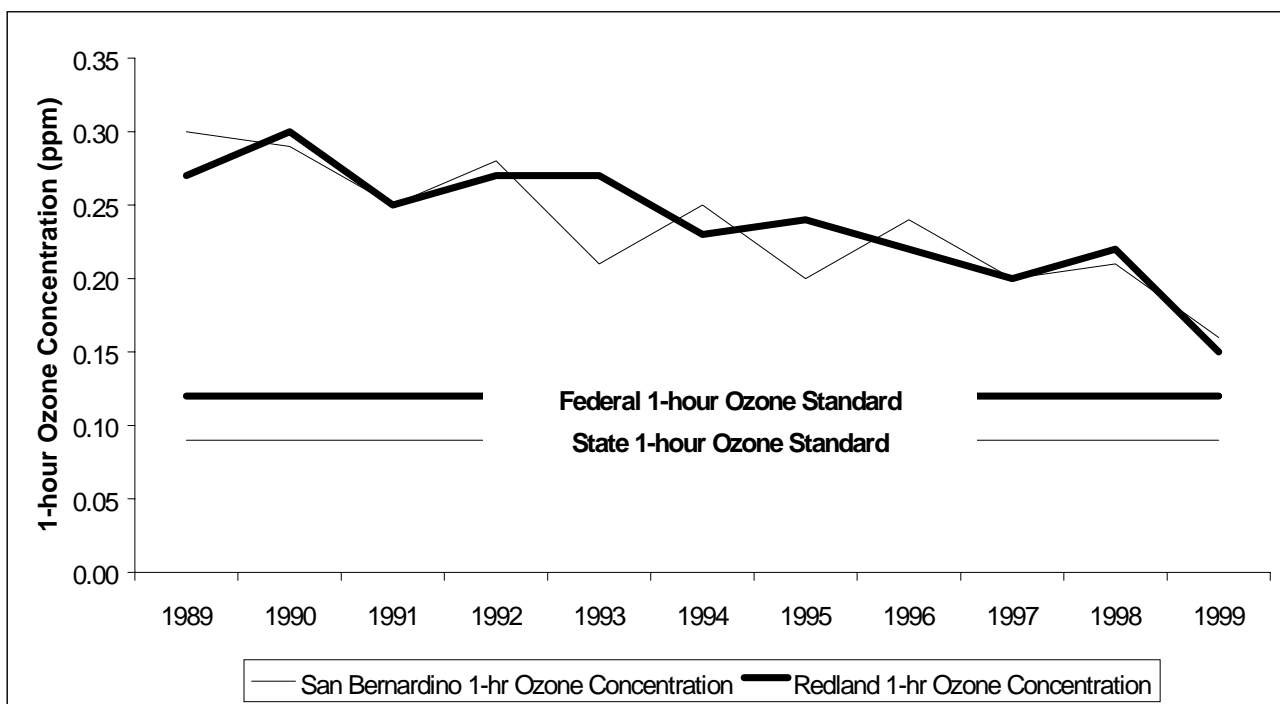
Source: South Coast Air Quality Management District

The project site has two air quality monitoring stations nearby. One in the City of San Bernardino on 4<sup>th</sup> street (4 miles to the west-northwest) and the other in the City of Redlands on Dearborn street (5.5 miles to the east-southeast). AIR QUALITY Figure 3 shows the general trends of exceedences of the 1-hour ozone standards near the project site using the monitoring data from these two stations. As can be seen, there is a significant downward trend in the number of days exceeding the federal and state 1-hour ozone standards from 1989 to 1999. AIR QUALITY Figure 4 shows the maximum annual 1-hour ozone concentrations measured at both monitoring stations from 1989 to 1999. AIR QUALITY Figure 4 demonstrates a downward trend in ozone formation near the project site. Given the overall trends in ozone formation in the South Coast air basin and near the power plant site, staff proposes to use the lowest 1- hour annual maximum ozone measurements to describe the background air quality conditions. The lowest annual maximum 1-hour ozone concentration was measured at the San Bernardino monitoring station in 1999 at 0.15 ppm.

**AIR QUALITY Figure 3**  
**Ozone Trend – Days Exceeding the State and Federal 1-hour Standard**  
**1989 to 1999**

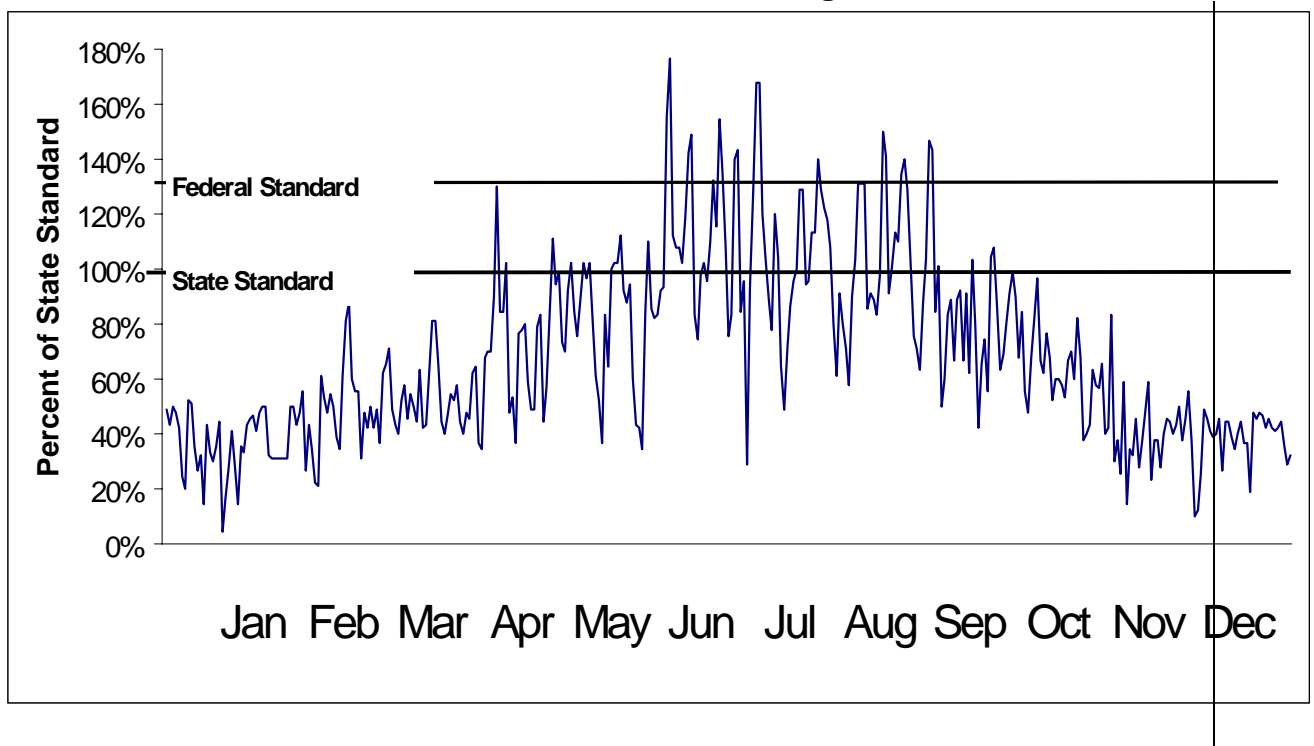


**AIR QUALITY Figure 4**  
**Maximum Measured Annual 1-hour Ozone Concentrations**  
**1989 to 1999**



AIR QUALITY Figure 5 shows the 1-hour daily maximum ozone measurement taken at the San Bernardino 4<sup>th</sup> street monitoring station. This data indicates that near the project site, the ozone violations occur primarily from April through September.

**AIR QUALITY Figure 5**  
**1999 Maximum Daily Ozone Measurements**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**



## OZONE TRANSPORT

The transportation of ozone and ozone precursors (NO<sub>x</sub> and VOC) outside of their air district or air basin of origin may cause or contribute to exceedences of the ozone air quality standards in a down wind areas. In their most recent report on the contribution of upwind air basins to ozone violations in downwind air basins (CARB 1996), the California Air Resources Board identifies several transport couplings for the South Coast air basin (see AIR QUALITY Table 3). These couplings come in three qualitative varieties, Overwhelming, Significant and Inconsequential. Overwhelming couplings indicate that emissions from the upwind area caused a violation of the state 1-hour ozone standard (0.09 ppm) on at least one day independently of any emission sources within the downwind area. Significant couplings indicate that emissions from the upwind area contribute, but not overwhelmingly, to a violation of the state 1-hour ozone standard. Inconsequential couplings indicate that emissions from the upwind area were not transported or did not contribute significantly to a violation of the state 1-hour ozone standard.

**AIR QUALITY Table 3**  
**Transport Couples for the South Coast Air Basin**

<b>Transport Couple</b>	<b>Characterization</b>
South Coast to Mojave Desert	O, S
South Coast to San Diego	O, S, I
South Coast to Salton Sea	O, S
South Coast to South Central Coast	S, I
South Central Coast to South Coast	S, I
Southeast Desert (now Mojave and Salton Sea) to South Coast	I
O – Overwhelming S – Significant I – Inconsequential	

In the case of the South Coast air basin, there are several downwind areas. In May 1996, CARB split the Southeast Desert air basin into the Mojave Desert and Salton Sea air basins. CARB determined that the South Coast air basin contributions to violations of the state 1-hour ozone standard in the Mojave Desert air basin were overwhelming on some days and significant on others, with inconsequential contributions occurring less frequently than once per year. CARB also determined that the South Coast air basin contributions to violations of the state 1-hour ozone standard in the Salton Sea air basin were overwhelming on some days and significant on others.

In the November 1996 Triennial Review, CARB re-enforced the 1993 findings that the South Coast air basin contributed to violations of the 1-hour state ozone standard in the San Diego air basin overwhelmingly on some days, significantly on some other days and inconsequentially on other days. However, the number of days where contributions were classified as overwhelming dropped from 20 in 1993 to 5 in 1995. The number of days that were classified as significant increased from 31 to 48 and the number of days that were classified as inconsequential increased from 39 to 43. Since there were significant improvements in ozone measurements within the South Coast air basin during this time frame (see AIR QUALITY Figure 2), it is reasonable to speculate that the improvement in ozone violations within the South Coast air basin and the transport connections outside the basin are related.

The transportation of ozone and ozone precursors from the South Coast air basin to the South Central Coast air basin is complicated by the existence of other transport couplings to the South Central Coast. The San Joaquin Valley air basin is classified as a significant contributor on some days and insignificant on others. The contributions from the California Coastal Waters (consisting of oil platforms and San Miguel, Santa Rosa and Santa Cruz Islands) are also considered significant on some days. Additionally there is a possibility that ozone transported within the inversion layer was tapped and may have been responsible for some of the ozone violations in the South Central Coast. In the November 1996, Second Triennial Review, CARB concludes that nine 1-hour ozone violations in Santa Barbara

County (part of the South Central Coast) from 1994 to 1996 seemed to be related to transport from outside of the county. CARB classifies the South Coast contributions as significant on some days and inconsequential on others. However, CARB further classifies the nine violation days in Santa Barbara County as shared transport days.

For mitigation purposes, CARB requires two things of upwind air basins, a commitment to adopt best available retrofit control technologies for NO<sub>x</sub> and VOC emission sources and, for overwhelming transport, the inclusion of measures in the air quality plans to ensure expeditious attainment of the state 1-hour ozone standard in the downwind areas. SCAQMD Rule 1135 is a retrofit rule that applies to all electric power generating systems except those regulated by the RECLAIM program (Regulation XX). The RECLAIM program is considered a retrofit rule because it continually reduces the emission limits of NO<sub>x</sub> sources within the SCAQMD authority. The South Coast Air Quality Management Plan addresses attainment of the **federal** 1-hour ozone standard by the year 2010 for the SCAQMD only. However, the South Coast Air Quality Management Plan will have a positive and significant effect on the number and severity of violations of the 1-hour state ozone standard in downwind areas. Therefore, staff finds that the South Coast Air Quality Management Plan is well within the intent of the proposed CARB mitigation for upwind air basins.

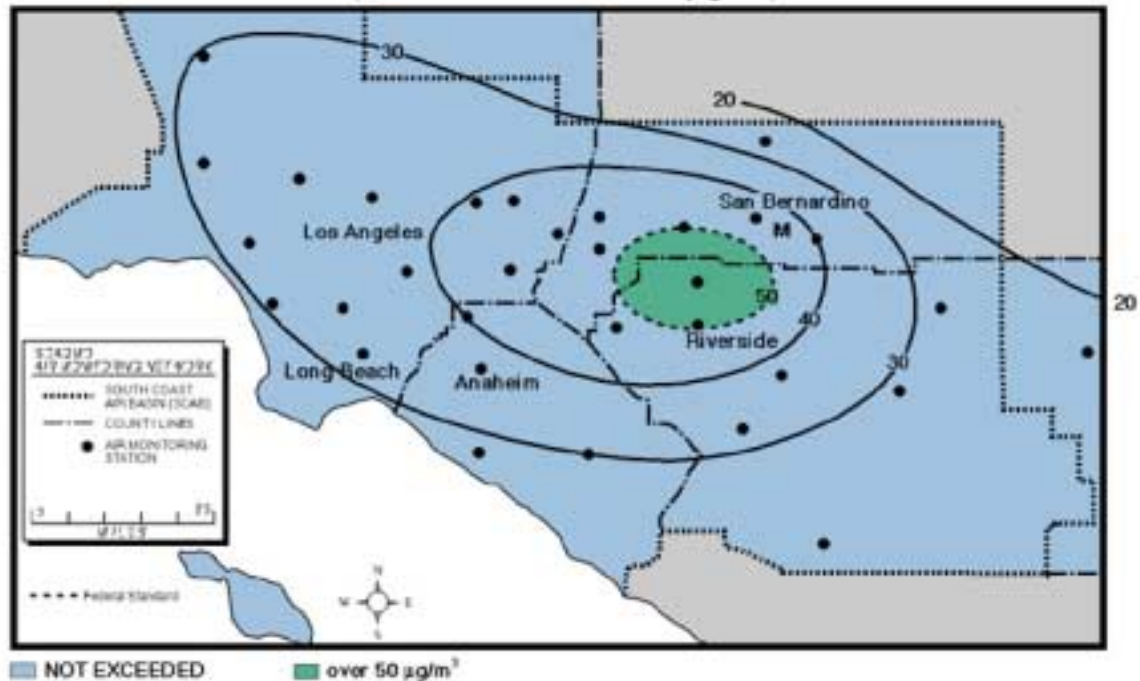
### ***AMBIENT PM<sub>10</sub>***

PM<sub>10</sub> is a particulate that is 10 microns in diameter or smaller that is suspended in air. PM<sub>10</sub> can be directly emitted from a combustion source (primary PM<sub>10</sub> or PM<sub>2.5</sub>) or soil disturbance (fugitive dust) or it can form downwind (secondary PM<sub>10</sub>) from some of the constituents of combustion exhaust (NO<sub>x</sub>, SO<sub>x</sub> and ammonia). San Bernardino (not the entire South Coast air basin) has been designated a non-attainment zone for the **federal** 24-hour and annual PM<sub>10</sub> ambient air quality standards. The South Coast air basin (including a portion of the San Bernardino County within the basin) has been designated as a non-attainment zone for the **state** 24-hour and annual PM<sub>10</sub> ambient air quality standards (see AIR QUALITY Table 2). AIR QUALITY Figure 6 shows the violations of the federal annual PM<sub>10</sub> standard for 1998 in the South Coast air basin. The highest PM<sub>10</sub> concentrations are occurring in both San Bernardino and Riverside Counties, as is shown in AIR QUALITY Figure 6. The project location is indicated by an **M** on AIR QUALITY Figure 6.

## AIR QUALITY Figure 6

### PM10 – 1998

Annual Arithmetic Mean,  $\mu\text{g}/\text{m}^3$   
(Federal Standard =  $50 \mu\text{g}/\text{m}^3$ )



Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

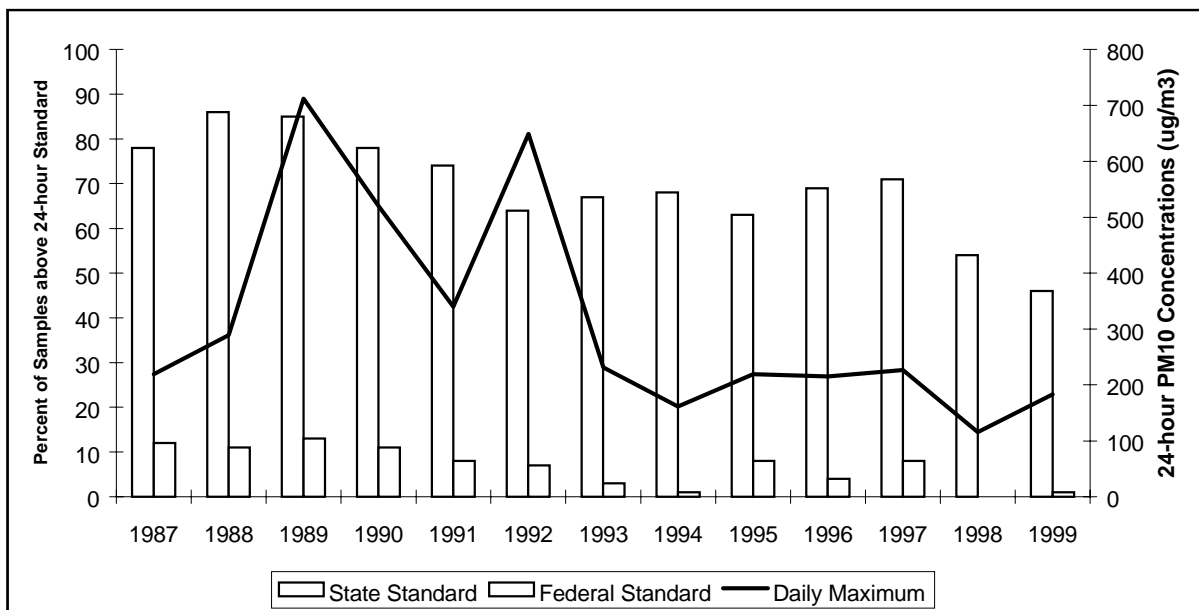
AIR QUALITY Figure 7 shows the historic trend of 24-hour PM10 concentrations and the percent of samples (or measurements) that exceed the state and federal ambient air quality standards. As the figure shows, the 24-hour annual maximum measured concentrations have been significantly reduced from 1987 to 1999. Although violations of the state standard are still numerous, violations of the federal standard is coming under control for the South Coast air basin. The annual geometric mean<sup>1</sup> (state annual PM10 standard,  $30 \mu\text{g}/\text{m}^3$ ) and the annual arithmetic mean<sup>2</sup> (federal annual PM10 standard,  $50 \mu\text{g}/\text{m}^3$ ) are still well over their respective ambient air quality standards, even though they show improvement from 1987 to 1999 (see AIR QUALITY Figure 8).

1 A geometric mean is the  $n^{\text{th}}$  root of the product of  $n$  measurements.

2 An arithmetic mean is the sum of  $n$  measurements divided by  $n$ .

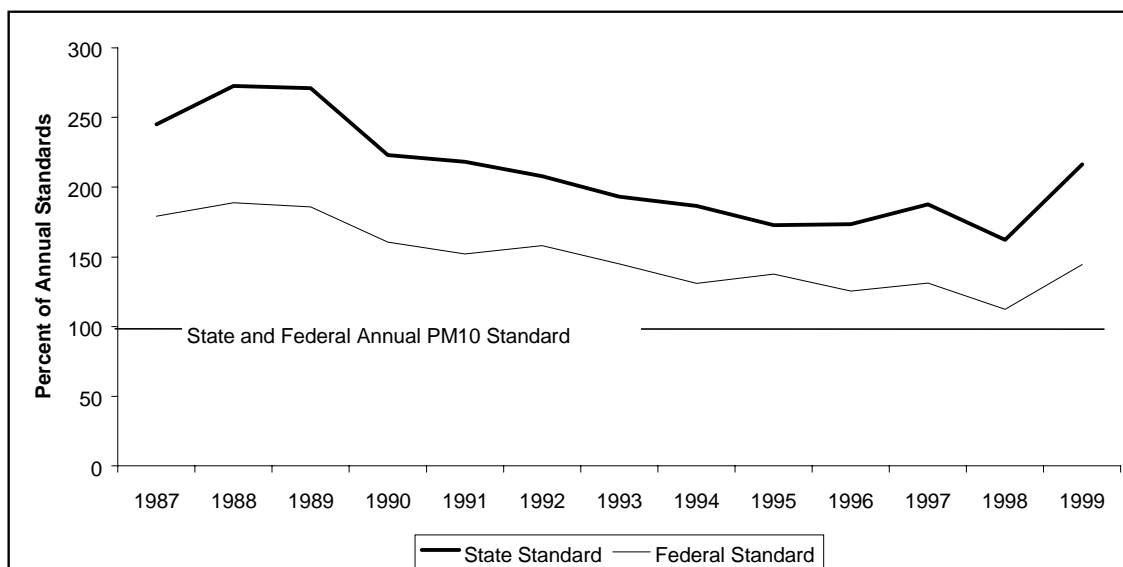
Note: Geometric means tend to generate a lower value than arithmetic means for the same set of measurements. This is because geometric means are less sensitive to extreme values.

**AIR QUALITY Figure 7**  
**Historic 24-hour PM<sub>10</sub> Concentrations within the South Coast Air District**  
**1987 to 1999**



Source: California Air Resources Board

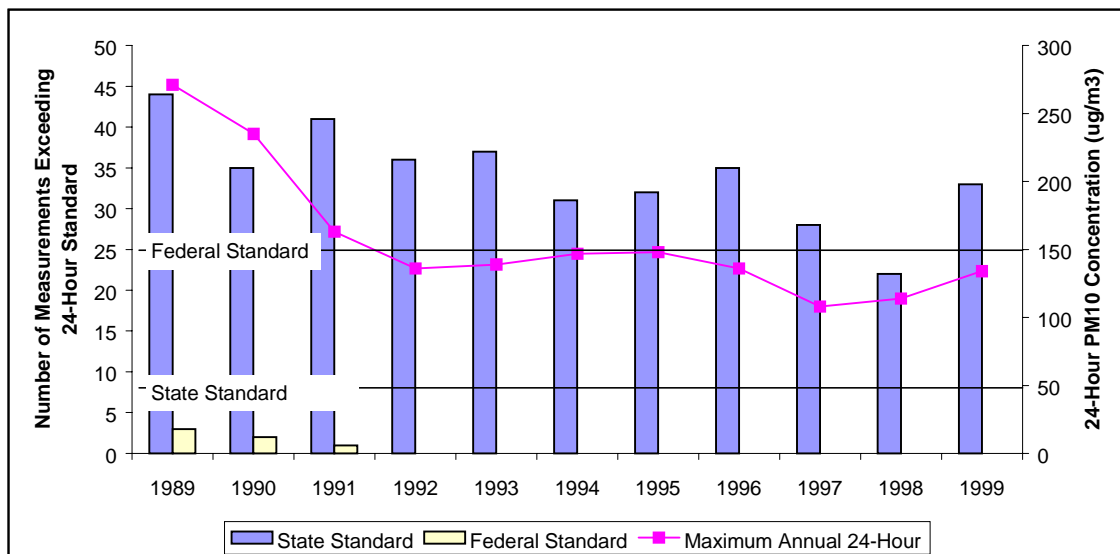
**AIR QUALITY Figure 8**  
**Historic Annual Average PM<sub>10</sub> Concentrations in the South Coast Air Basin**  
**1987 to 1999**



Source: California Air Resources Board

AIR QUALITY Figure 9 shows the historic (1989 to 1999) 24-hour PM10 measurements made at the San Bernardino 4<sup>th</sup> street monitoring station. As can be seen, the federal 24-hour PM10 standard (150 ug/m<sup>3</sup>) has not been exceeded since 1992 at this station, however the state 24-hour PM10 standard continues to be exceeded. The annual maximum 24-hour PM10 measurements at the 4<sup>th</sup> street monitoring station improved from 1989 to 1992, but appears to stabilize between 150 and 100 ug/m<sup>3</sup> with a slight downward trend there after. Therefore, staff recommends the use of the 1995 annual maximum 24-hour PM10 measurement recorded at the San Bernardino, 4<sup>th</sup> street monitoring station to represent the background 24-hour PM10 concentrations for modeling purposes. That measurement is 148 ug/m<sup>3</sup>.

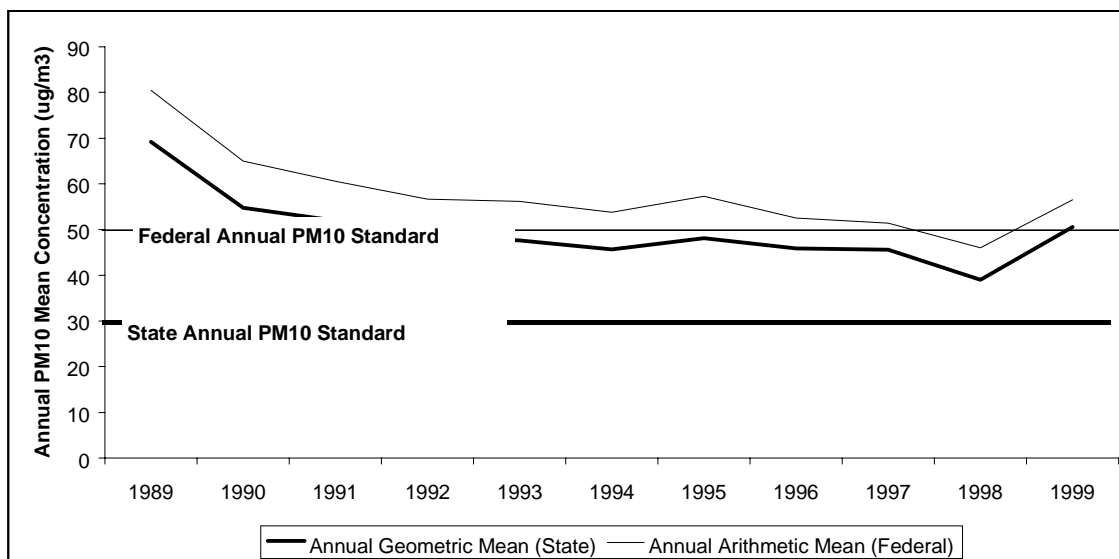
**AIR QUALITY Figure 9**  
**Historic 24-hour PM10 Measurements**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**  
**1989 to 1999**



Source: California Air Resources Board

AIR QUALITY Figure 10 shows the annual geometric and arithmetic means for the PM10 measurements at the San Bernardino 4<sup>th</sup> street monitoring station from 1989 to 1999. As can be seen, there is a notable improvement from 1989 to 1992, which stabilizes between 40 and 50 ug/m<sup>3</sup> with a slight downward trend there after. Since there is a significant jump in 1999 over the annual means recorded in 1998, staff recommends the use of the highest recent measurements to represent the annual PM10 background for modeling purposes. In staff's opinion the highest recent measurement for the arithmetic mean (federal standard) at the San Bernardino, 4<sup>th</sup> street monitoring station was in 57.3 ug/m<sup>3</sup> in 1995. The highest recent measurement for the geometric mean (state standard) at the same monitoring station was 50.6 ug/m<sup>3</sup> in 1999.

**AIR QUALITY Figure 10**  
**Historic Annual PM<sub>10</sub> Measurements**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**  
**1989 to 1999**



Source: California Air Resources Board

## SECONDARY PM<sub>10</sub>

PM<sub>10</sub> can be formed downwind from an emission source as a secondary emission (similar to ozone) from a reaction between ammonia and airborne acids. The most dominant reactions are between SO<sub>x</sub> emissions (as sulfuric acid, H<sub>2</sub>SO<sub>4</sub>) and NO<sub>x</sub> emissions (as nitric acid, HNO<sub>3</sub>). The complexity of these reactions arises from the formation of gaseous, liquid and solid forms of the products and reactants involved. The qualitative understanding of these reactions indicates that all the available ammonia will be reacted with all the available sulfuric acid prior to any ammonia being reacted with any available nitric acid (Seinfeld 1986). From this presumption, two cases of interest arise. The sulfate rich case, where the molar ratio of ammonia (NH<sub>3</sub>) to sulfate (SO<sub>4</sub>) is less than 2, so that there is insufficient ammonia to react with the sulfate. The ammonia rich case, where the molar ratio of ammonia to sulfate is greater than 2, so that the sulfate is completely reacted and there is excess ammonia (Seinfeld 1986).

The nitrate reaction with ammonia is an equilibrium reaction between the reactants (ammonia and nitric acid) in gaseous form and the product (ammonium nitrate) in solid or aqueous form (Seinfeld 1986). To determine if ammonium nitrate (NH<sub>4</sub>NO<sub>3</sub>) will be formed, the product of the total nitrate (HNO<sub>3</sub> + NO<sub>3</sub><sup>-</sup>, TN) and total ammonia (NH<sub>3</sub> + NH<sub>4</sub><sup>+</sup>, TA) available is compared to the equilibrium dissociation constant (K<sub>p</sub>) for pure ammonium nitrate at the ambient temperature and relative humidity (Seinfeld 1986). If the resulting product (TN\*TA) is greater than K<sub>p</sub> then ammonium nitrate should form (Seinfeld 1986). If ammonia, nitric acid and ammonium nitrate can be measured in the area of interest then it can be presumed that the product (TN\*TA) is greater than K<sub>p</sub> and that the reaction is occurring. Assuming

conservation of total ammonia and nitrate, ammonium nitrate (AN) can be estimated (see Appendix A for complete calculations).

For the purpose of determining the secondary PM<sub>10</sub> potential impacts it is necessary to determine first if the area is either ammonia rich or sulfate rich as discussed above. Then second, to determine what additional ammonium sulfate and ammonium nitrate are likely to form. Lastly, those impacts must be compared to the existing background measurements that are available. Therefore, for these purposes only, staff presents background ambient air quality measurements for ammonia, nitric acid, nitrate and sulfate.

Ammonia and nitric acid are not typically measured in the South Coast air basin, however a 1995 study regarding dairy emissions included ambient measurements of ammonia and nitric acid for several specific days. The nearest measurements taken were at the Fontana monitoring station in San Bernardino County and the Rubidoux monitoring station in Riverside County. The 1995 study also included the annual average ammonia and nitric acid concentrations at Fontana and Rubidoux. AIR QUALITY Table 3 shows the maximum measured ammonia concentration and the annual average concentrations of ammonia and nitric acid. Since no further information is available on ammonia or nitric acid ambient air concentrations, staff recommends the values in AIR QUALITY Table 3 to represent the environmental background for ammonia and nitric acid.

**AIR QUALITY Table 3  
Ammonia and Nitric Acid Concentrations  
Fontana and Rubidoux  
South Coast Air District – 1995**

Monitoring Site	Maximum Ammonia Concentration (ug/m <sup>3</sup> )	Annual Ammonia Concentration (ug/m <sup>3</sup> )	Annual Nitric Acid Concentration (ug/m <sup>3</sup> )
Fontana <sup>1</sup>	25.93	13	2.9
Rubidoux <sup>2</sup>	25.43	39	0.9
1 Measured November 16, 1995			
2 Measured November 17, 1995			

Source: 1995 Dairy Emissions Study, South Coast Air Quality Management District

Nitrate and sulfate ambient air measurements are also available at the Fontana and Rubidoux monitoring stations (from 1986 to 1999). The available data suggests that, while the maximum nitrate and sulfate concentrations fluctuate significantly over time, the annual averages show a slight, although steady, improvement. This may be in response to the improved ozone concentrations or to changing agriculture and industrial activities. To be consistent with the 1995 dairy study, staff recommends using the 1995 nitrate and sulfate ambient air quality data reported at Fontana and Rubidoux (see AIR QUALITY Table 4) for the same days the study was performed (as noted in AIR QUALITY Table 3).

**AIR QUALITY Table 4**  
**Sulfate and Nitrate Concentrations**  
**Fontana and Rubidoux**  
**South Coast Air District – 1995**

Monitoring Stations	Maximum Concentration (ug/m <sup>3</sup> )	Annual Average Concentration (ug/m <sup>3</sup> )
<b>Sulfate</b>		
Fontana	2.7 <sup>1</sup>	4.03
Rubidoux	3.6 <sup>1</sup>	4.81
<b>Nitrate</b>		
Fontana	24.6 <sup>1</sup>	6.9
Rubidoux	30.9 <sup>1</sup>	11.69
1 Measurements taken on November 19, 1995		

Source: California Air Resources Board

Dividing the annual average ammonia concentrations by the annual average sulfate concentrations at both monitoring stations results in a ratio of 3.22 for Fontana and 8.11 for Rubidoux. Therefore, as discussed earlier, the area would be considered ammonia rich (ie., the ammonia to sulfate ratio is greater than 2:1). On November 16 and 17 of 1995, the maximum concentrations of ammonia were measured at the Fontana and Rubidoux monitoring stations respectively (see AIR QUALITY Table 3). Comparing these to the closest sulfate concentrations at those stations (measured on November 19, 1995), results in a ratio of 9.60 for Fontana and 7.06 for Rubidoux. Therefore, it is staff's recommendation to conclude that the area near the proposed power plant site is ammonia rich.

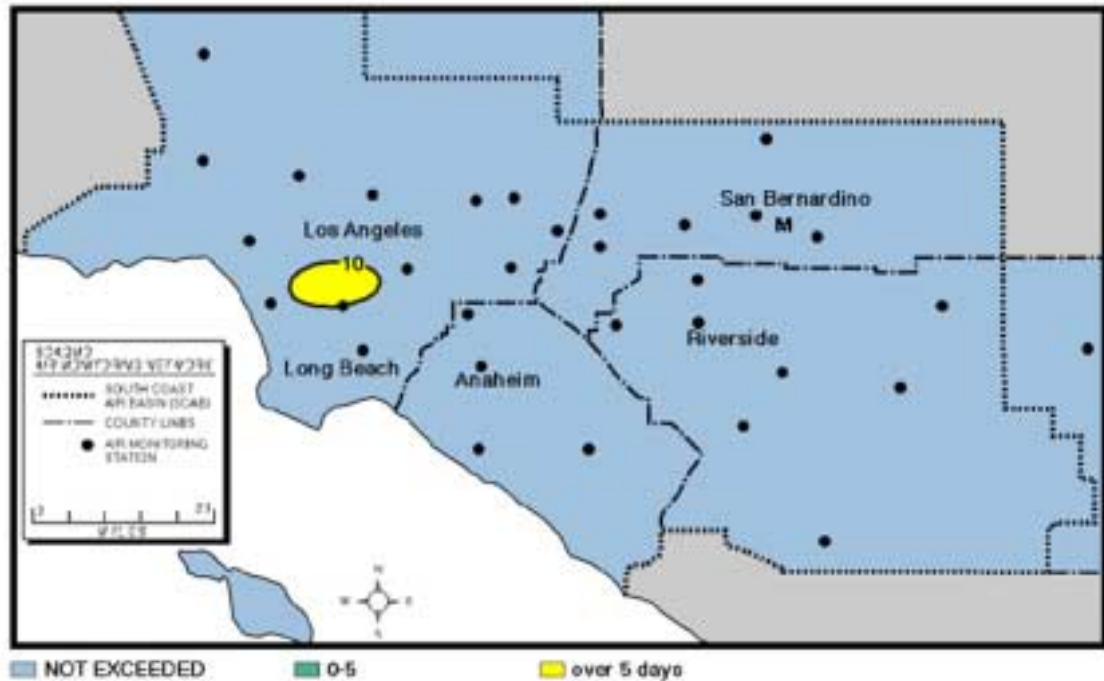
### ***CARBON MONOXIDE***

Carbon monoxide (CO) is a directly emitted air pollutant as a result of combustion. The South Coast Air Quality Management District is designated Serious Non-Attainment for the federal 1-hour and 8-hour CO ambient air quality standards. This means that the area has an average CO concentration value of 16.5 ppm or above. However, as AIR QUALITY Figure 11 shows, the exceedences of the federal CO standard occur in Los Angeles County which is a considerable distance from the project site. San Bernardino County (including the portion in the SCAQMD) is designated attainment for the state 1-hour and 8-hour ambient air quality standards.

# AIR QUALITY Figure 11

## CARBON MONOXIDE - 1998

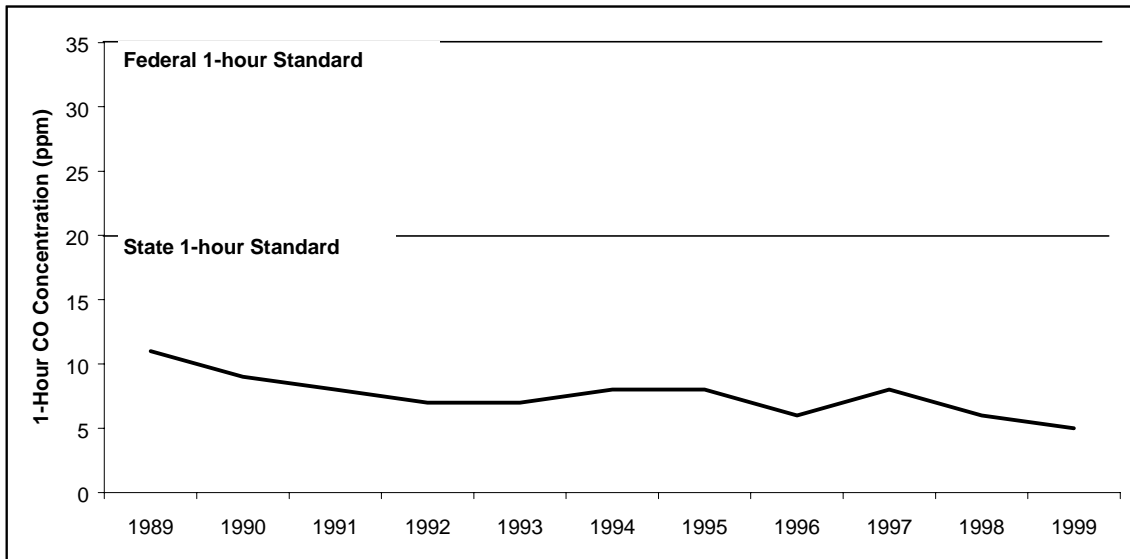
Number of Days Exceeding Federal Standard  
(8-Hour Average CO > 9.5 ppm)



Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

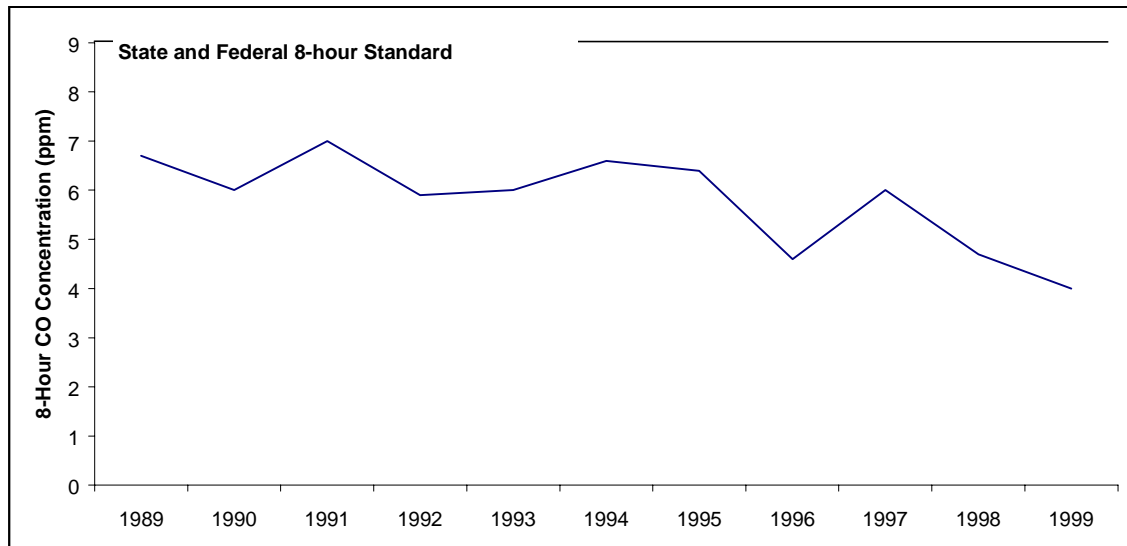
The closest CO monitoring station to the project site is the San Bernardino station. AIR QUALITY Figures 12 and 13 show the historical CO concentrations at the San Bernardino monitoring station. These figures demonstrate a slight downward trend from 1989 to 1999. Therefore staff recommends the lowest value be used for the background CO concentrations for air quality impact modeling purposes. For both the 1-hour and 8-hour standards, this is the 1999 measurement of 5 ppm and 4.0 ppm respectively.

**AIR QUALITY Figure 12**  
**Historical 1-Hour CO Concentrations**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**  
**1989 to 1999**



Source: California Air Resources Board

**AIR QUALITY Figure 13**  
**Historical 8-Hour CO Concentrations**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**  
**1989 to 1999**

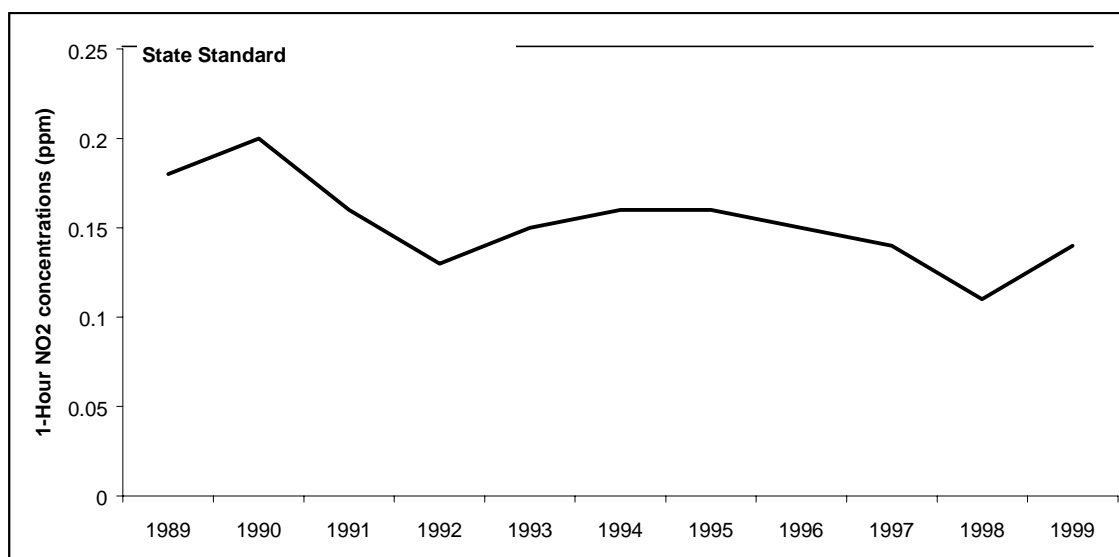


Source: California Air Resources Board

## NITROGEN DIOXIDE

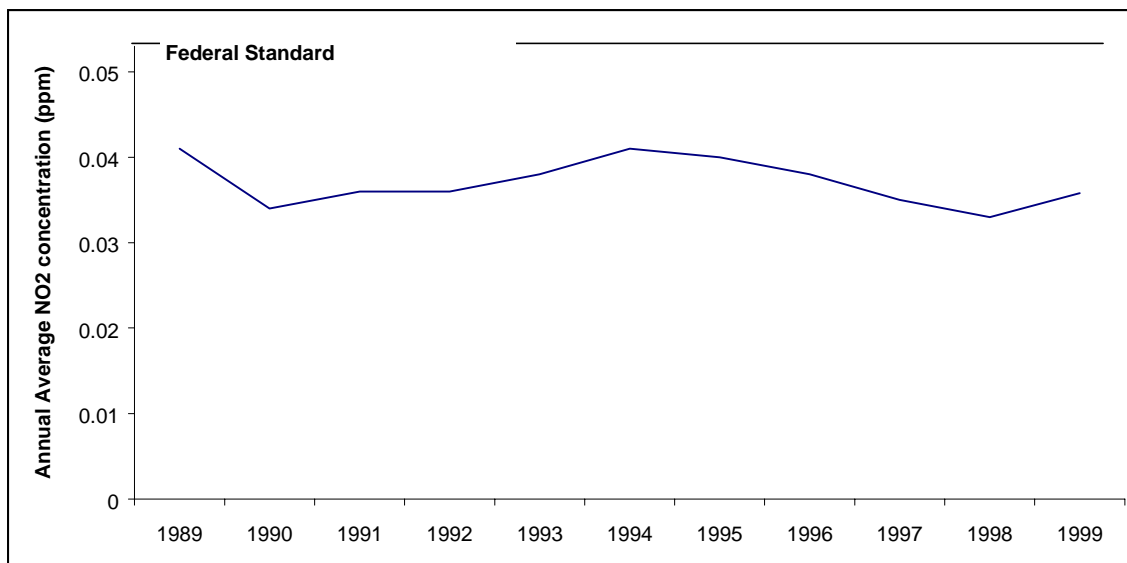
Nitrogen dioxide (NO<sub>2</sub>) can be emitted directly as a result of combustion or formed from nitric oxide (NO) and oxygen. NO is typically emitted from combustion sources and readily reacts with oxygen or ozone to form NO<sub>2</sub>. The NO reaction with ozone can occur within minutes and is typically referred to as ozone scavenging. By contrast, the NO reaction with oxygen is on the order of hours under the proper conditions. The South Coast Air Basin is designated attainment for both the state and federal NO<sub>2</sub> ambient air quality standards. AIR QUALITY Figures 14 and 15 show the 1-hour and annual NO<sub>2</sub> concentrations measured at the San Bernardino monitoring station, the closest NO<sub>2</sub> monitoring station to the project site. These figures show a slight, but erratic improvement in NO<sub>2</sub> concentrations from 1989 to 1999. Staff therefore recommends that the 1999 measurements be used as they represent reasonably higher values and are the most recent. The 1-hour and annual average NO<sub>2</sub> concentrations measured at the San Bernardino monitoring station in 1999 are 0.14 ppm and 0.0358 ppm respectively.

**AIR QUALITY Figure 14**  
**Historical 1-Hour NO<sub>2</sub> Concentrations**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**  
**1989 to 1999**



Source: California Air Resources Board

**AIR QUALITY Figure 15**  
**Historical Annual Average NO<sub>2</sub> Concentrations**  
**San Bernardino, 4<sup>th</sup> Street Monitoring Station**  
**1989 to 1999**

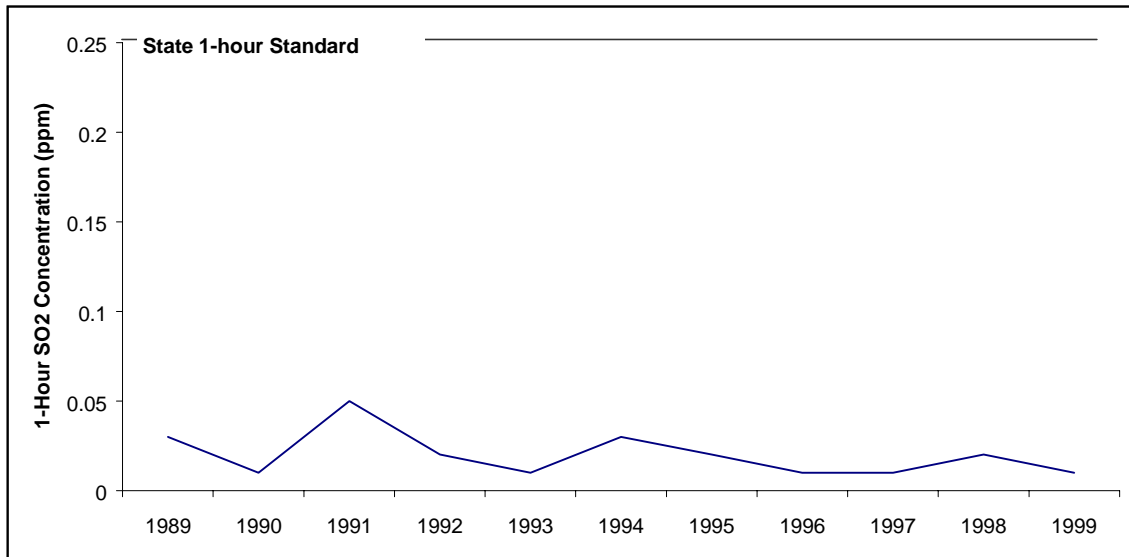


Source: California Air Resources Board

## ***SULFUR DIOXIDE***

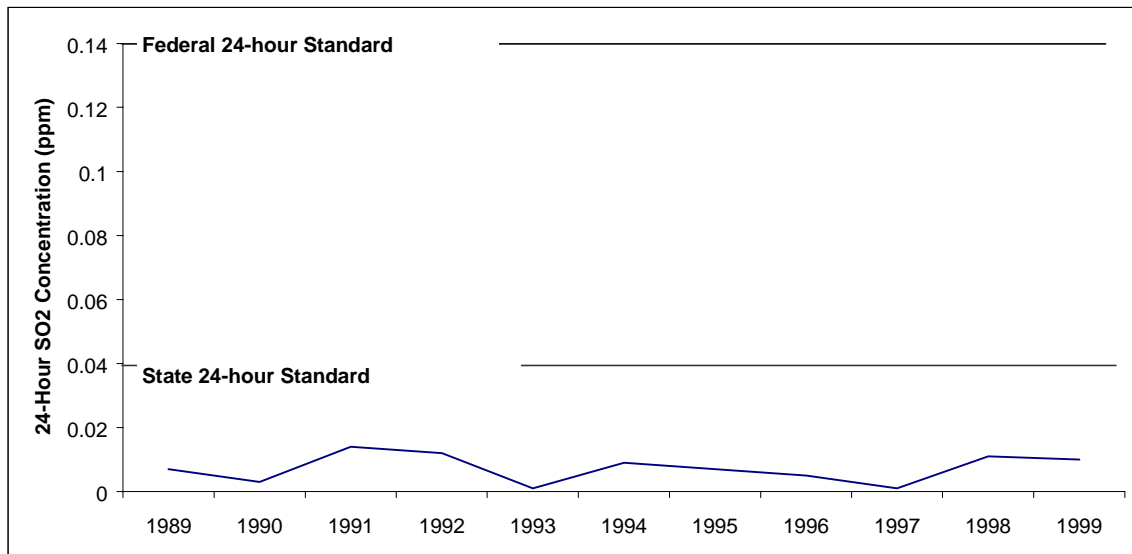
Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO<sub>2</sub> emissions when combusted. By contrast fuels high in sulfur content such as lignite (a type coal) emit very large amounts of SO<sub>2</sub> when combusted. Sources of SO<sub>2</sub> emissions within the South Coast Air District come from every economic sector and include a wide variety of fuels, gaseous, liquid and solid. The South Coast air basin is designated attainment for all the SO<sub>2</sub> state and federal ambient air quality standards. The closest SO<sub>2</sub> monitoring station to the project site is in Fontana on Arrow Hwy. AIR QUALITY Figures 16, 17 and 18 show the historic 1-hour, 24-hour and annual average SO<sub>2</sub> concentrations measured at the Fontana monitoring station. These figures show that the concentrations of SO<sub>2</sub> are far below the state and federal SO<sub>2</sub> ambient air quality standards. However, the trends are ambiguous and indicate neither an increase nor a decrease in SO<sub>2</sub> concentrations. Therefore staff recommends the highest concentrations within the last 5 years be used to represent the background for SO<sub>2</sub> for modeling purposes. For the 1-hour standard, this is 0.02 ppm (measured in 1998). For the 24-hour standard, 0.011 ppm (1998). For the annual standard, 0.0018 (1999).

**AIR QUALITY Figure 16**  
**Historical 1-Hour SO<sub>2</sub> Concentrations**  
**Fontana, Arrow Highway Monitoring Station**  
**1989 to 1999**



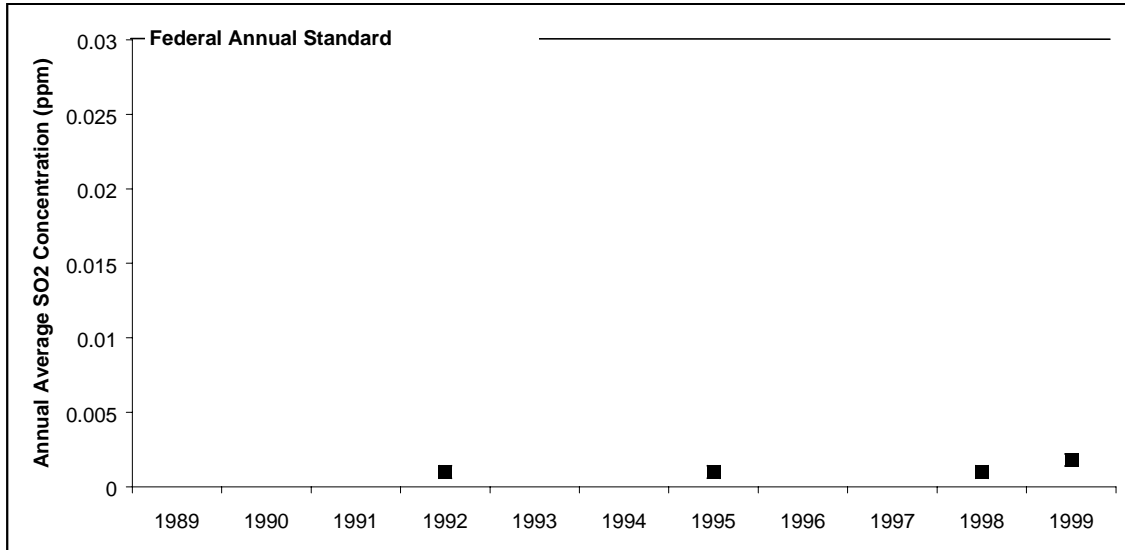
Source: California Air Resources Board

**AIR QUALITY Figure 17**  
**Historical 24-Hour SO<sub>2</sub> Concentrations**  
**Fontana, Arrow Highway Monitoring Station**  
**1989 to 1999**



Source: California Air Resources Board

**AIR QUALITY Figure 18**  
**Historical Annual Average SO<sub>2</sub> Concentrations**  
**Fontana, Arrow Highway Monitoring Station**  
**1989 to 1999**



Source: California Air Resources Board

## SUMMARY

In summary staff recommends the background ambient air concentrations in AIR Quality Table 5 for the purpose of modeling and evaluating potential ambient air quality impacts from the proposed project.

**AIR QUALITY Table 5**  
**Staff Recommended Background Concentrations**

Pollutant	Averaging Time	Concentration (ug/m <sup>3</sup> )	Concentration (ppm)
Ozone	1 Hour	332.9	0.17
Particulate Matter	Annual Geometric Mean	50.6	--
	Annual Arithmetic Mean	57.3	--
	24 Hour	148	--
	Annual Ammonia	39	--
	Annual Nitric Acid	2.9	--
	Annual Sulfate	4.81	--
	Annual Nitrate	11.69	--
Carbon Monoxide	8 Hour	4,444	4.0
	1 Hour	5,750	5
Nitrogen Dioxide	Annual Average	67.54	0.0358
	1 Hour	263.2	0.14
Sulfur Dioxide	Annual Average	4.8	0.0018
	24 Hour	28.9	0.011
	1 Hour	52.4	0.02

## PROJECT DESCRIPTION AND EMISSIONS

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### CONSTRUCTION

The MVPP will construct or modify the following major elements at the project site:

- The addition of four General Electric Frame 7FA gas fired combustion turbines with duct fired heat recovery steam generators (HRSG) driving two steam turbines, arranged into two 2-on-1 systems (referred to as units 3 and 4).
- The addition of two new 10-cell (0.0006 drift rate) cooling towers in a 2x5 configuration serving the new turbines.
- The replacement of existing cooling towers serving the existing boiler units (referred to as units 1 and 2) with two new 4-cell (0.0006 drift rate) cooling towers.
- The addition of a new 182 Bhp diesel fired firewater pump.
- The addition of a new 5,900 Bhp diesel fired emergency generator.
- Modification of the existing switch yard including the expansion of the bus bar system, additional circuit breakers, expansion of the ground cable system and additional power line towers.

The MVPP will construct the following linear ancillary service projects off the project site:

- The natural gas line will be 24 to 30 inches in diameter and 17 miles long.
- The proposed water pipeline is 2.3 miles long and 12 to 16 inches in diameter, however the water supply has not been confirmed at this time.
- A wastewater brine pipeline is 12 inches in diameter and 1,100 feet long.

Construction activities, on or off site, will generate air emissions from earth moving activities and construction equipment. On-site construction is expected to last 19 months with the highest fugitive emissions occurring in the second month and the highest overall emissions occurring in the seventh month. Offsite construction is expected to be completed much faster than on-site construction, on the order of six months.

MVPC proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from MVPC that follow this section take these control measures into consideration.

To control exhaust emissions from heavy diesel construction equipment:

- Limit engine idle time and shutdown equipment when not in use (although a specific time limit was not indicated).
- Perform regular preventative maintenance to reduce engine problems.

- Use CARB Low-Sulfur fuel for all heavy construction equipment.
- Ensure that all heavy construction equipment complies with EPA 1996 Diesel standards.

To control fugitive dust emissions:

- Use water application or chemical dust suppressant on unpaved travel surfaces and parking areas.
- Use vacuum or water flushing on paved travel surfaces and parking areas.
- Require all trucks hauling loose material to either cover or maintain a minimum of two feet of freeboard.
- Limit traffic speed on unpaved roads to 25 mph.
- Install erosion control measures.
- Re-plant disturbed areas as soon as possible.
- Use gravel pads and wheel washers as needed.
- Use wind breaks and chemical dust suppressant or water application to control wind erosion from disturbed areas.

## ***PROJECT SITE***

The power plant itself will take approximately 19 months to construct. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest fugitive dust emissions are generated during the civil/structural activity, where work such as demolition, grading, site preparation, foundations, underground utility installation and building erection 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. This is a relatively small emissions generating activity in comparison to the early construction activities. From estimates made by MVPC, the emissions from the seventh month of construction are significantly higher than those from the second month with the exception of fugitive dust emissions. The MVPC estimates for the highest daily emissions, based on the seventh month emissions are shown in AIR QUALITY Table 6. AIR QUALITY Table 6 also shows the expected daily emission totals based on the second month of construction. As can be seen, the fugitive dust emissions are significantly higher for the second month than the seventh even though the rest of the criteria pollutants are far lower. AIR QUALITY Table 7 shows the expected annual emissions from construction activities at the project site.

**AIR QUALITY Table 6**  
**Maximum Daily On-site Construction Emissions (lbs/day)**

	Nox	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	257.49	35.38	368.00	8.49	16.26	10.82
Truck Deliveries <sup>1</sup>	27.28	2.81	19.98	1.43	1.59	0.11
Rail Deliveries	83.93	3.11	8.27	5.36	2.08	2.60
Worker Travel <sup>1</sup>	65.67	73.21	671.81	0.08	2.21	0.38
Windblown Dust <sup>2</sup>	--	--	--	--	--	14.86
Total <sup>3</sup>	434.37	114.51	1,068.06	15.36	22.14	28.77
Emissions from second month of construction	171.14	50.18	479.30	5.00	10.28	41.60
1 Includes both paved and unpaved road travel 2 Includes emissions from the active construction area, laydown area and contractor parking. 3 Emission totals for the seventh month of construction.						

Source: (MVPC 2000ff)

**AIR QUALITY Table 7**  
**Annual On-site Construction Emissions (tons/year)**

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	13.25	1.81	18.52	0.42	0.88	2.54 <sup>1</sup>
Truck Deliveries <sup>1</sup>	3.44	0.36	2.52	0.18	0.20	--
Rail Deliveries	3.55	0.13	0.35	0.23	0.09	--
Worker Travel <sup>1</sup>	8.81	9.82	90.14	0.01	0.30	--
Windblown Dust <sup>2</sup>	--	--	--	--	--	2.71
Total	29.05	12.12	111.53	0.84	1.47	5.25
1 Includes construction, truck deliveries, train deliveries and worker travel. 2 Includes emissions from the active construction area, laydown area and contractor parking.						

Source: (MVPC 2000ff)

## **LINEAR FACILITIES**

The linear facilities include the natural gas pipeline, the water supply pipeline and the wastewater pipeline. The construction of all linear facilities is not expected to last longer than six months.

The natural gas pipeline will be a new 17-mile long line from the Southern California Gas line 4000/4002 near Etiwanda Avenue in the city of Rancho Cucamonga. The

natural gas pipeline will be laid entirely within the existing right-of-ways of city streets and will enter the power plant site from San Bernardino Avenue. The natural gas pipeline construction will include a new metering station and gas compressors at the project site. The natural gas pipeline will be buried with a minimum cover of 36 inches along the entire route. Trenching will be done in 500 foot increments, except when horizontal drilling is required. AIR QUALITY Table 8 shows the maximum daily emissions expected from the construction of the natural gas pipeline.

**AIR QUALITY Table 8**  
**Maximum Daily Natural Gas Pipeline Construction Emissions (lbs/day)**

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	56.2	4.0	17.5	1.9	3.3	0.54
Truck Deliveries	14.29	1.47	10.47	0.75	0.83	0.06
Excavation	--	--	--	--	--	1.22
Back Filling	--	--	--	--	--	0.08
Windblown Dust	--	--	--	--	--	0.02
Total	70.49	5.47	27.97	2.65	4.13	1.92

Source: (MVPC 2000ff)

The current proposal for the water supply to the new facility is to use existing and new wells on the power plant site in addition to reclaimed water from the City of Redlands water treatment plant, which would require a water pipeline approximately 2.3 miles long. The water supply pipeline would be buried in a trench approximately 24 inches wide and ranging in depth from 60 to 90 inches. MVPC proposes to excavate 100-foot sections of the water supply pipeline at a time except where horizontal drilling is required. AIR QUALITY Table 9 shows the maximum daily emissions expected from the construction of the water supply line.

**AIR QUALITY Table 9**  
**Maximum Daily Water Supply Pipeline Construction Emissions (lbs/day)**

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	47.5	3.1	11.2	1.4	2.8	0.11
Truck Deliveries	7.15	0.74	5.23	0.38	0.42	0.01
Excavation	--	--	--	--	--	0.11
Back Filling	--	--	--	--	--	0.01
Windblown Dust	--	--	--	--	--	0.00
Total	54.65	3.84	16.43	1.78	3.22	0.24

Source: (MVPC 2000ff)

The wastewater pipeline will be 12 inches in diameter and will connect an existing water pipeline on the project site to an existing Santa Ana River Industrial (SARI) discharge line. This line ultimately runs to the Orange County Sanitation District's Fountain Valley Wastewater Treatment facility, where the wastewater is treated prior to discharge to the Pacific Ocean. The new connecting pipeline will be buried with a minimum cover of 36 inches in most locations. At other locations the wastewater pipeline will be attached to existing bridges to cross waterways. The construction of the wastewater pipeline is not expected to last more than two months. AIR QUALITY Table 10 shows the maximum daily emissions from the construction of the wastewater pipeline.

**AIR QUALITY Table 10**  
**Maximum Daily Wastewater Pipeline Construction Emissions (lbs/day)**

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	22.1	1.6	7.5	0.8	1.3	0.03
Truck Deliveries	3.57	0.37	2.62	0.19	0.21	0.00
Excavation	--	--	--	--	--	0.02
Back Filling	--	--	--	--	--	0.00
Windblown Dust	--	--	--	--	--	0.00
Total	25.67	1.97	10.12	0.99	1.51	0.05

Source: (MVPC 2000ff)

## **OPERATIONAL PHASE**

### ***EQUIPMENT DESCRIPTION***

The equipment at the MVPP will consist of the following components:

- Four natural gas fired General Electric Frame 7FA combustion turbine generators (CTG), nominally rated at approximately 175 MW. Each of the CTGs will be equipped with evaporative inlet air coolers;
- Each CTG would be equipped with gas fired heat recovery steam generators (HRSG) and ancillary equipment;
- Two steam turbine, rated at approximately 200 MW;
- Two ten-cell cooling towers with 0.0006% drift rates for the new CTGs;
- Two four-cell cooling towers with 0.0006% drift rates for the existing boilers;
- One 182 Bhp diesel fired firewater pump;
- One 5,900 Bhp diesel fired emergency engine;
- Two existing gas fired boilers-steam turbine pairs, rated at 69 MW each.

### ***EQUIPMENT OPERATION***

The MVPP is intended to be a base loaded power plant with the capability to respond to market demands. The two boilers (units 1 & 2) and the four CTGs (units 3 & 4) will operate exclusively on natural gas. The 182 Bhp firewater pump and the 5,900 Bhp emergency IC engine will operate exclusively on diesel fuel. For clarification purposes, it is important to understand that the existing boilers (units 1 and 2) are considered to be part of the new facility. The operations at the existing boilers are proposed to be increased and are coupled with a change in emission controls and a net increase in emissions.

### ***EMISSION CONTROLS***

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO<sub>2</sub> and PM<sub>10</sub> emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur dioxide emissions in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low.

Like SO<sub>2</sub>, the emissions of PM<sub>10</sub> from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue; therefore it is a relatively clean-burning fuel. A sulfur content of 0.75 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO<sub>2</sub> emission calculations.

To minimize NO<sub>x</sub>, CO and VOC emissions during the combustion process, the CTGs are equipped with the latest dry low-NO<sub>x</sub> combustor design developed by GE. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis.

After combustion, the flue gases pass through the natural gas fired heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NO<sub>x</sub>, CO and VOC emissions. MVPC is proposing to use a Selective Catalytic Reduction (SCR) system to reduce NO<sub>x</sub> emissions. An oxidizing catalyst, will also be installed in the HRSG to reduce CO and VOC emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

The existing boilers (units 1 and 2) will be retrofitted with water injection and possibly overfire air modifications or an ammonia injection system to control the formation of NO<sub>x</sub> emissions.

### ***PROJECT OPERATING EMISSIONS***

The air emissions associated with the MVPP are shown in AIR QUALITY Tables 11 and 12. Table 11 shows the emission rates for the GE Frame 7FA turbines equipped with DLN combustors, SCRs and oxidation catalysts. Table 11 also shows the estimated emission rates for the boilers (from recent source testing), the cooling towers (two towers for the boiler systems and two towers for the four turbines), the emergency IC engine and the firewater pump. AIR QUALITY Table 12 shows the emission rates for the turbines at various ambient temperatures and with or without the HRSG duct firing natural gas. The emission rates in AIR QUALITY Table 12 are used to calculate the long-term annual average emissions for the MVPP. The short-term (hourly through daily) emissions are calculated using the emission rates in AIR QUALITY Table 11. The NO<sub>x</sub> and CO emission rates shown in AIR QUALITY Table 12 assume that the MVPP will average (on an annual basis) a lower concentration than that used for the short-term emission rates. For NO<sub>x</sub>, the short-term emission rates are based on a 2.5 ppm concentration limit, the long-term emission rates are based on 1.0 ppm concentration limit. For CO, the short-term emission rates are based on a 6.0 ppm concentration limit and the long-term emission rates are based on a 2.0 ppm concentration limit. Since both NO<sub>x</sub> and CO emissions will be continuously monitored in the stack (see compliance with LORS section), making this assumption is reasonable and enforceable.

**AIR QUALITY Table 11**  
**Short-Term Estimated Emission Rates**  
**(lbs/hour)**

Equipment	Operation	NOx	SOx	CO	VOC	PM10
Turbine	Full Load <sup>1</sup>	16.59	1.32	24.20	3.24	11.00
	Full Load <sup>2</sup>	17.77	1.42	25.91	3.47	11.00
	Cold Startup	20.00	0.86	50.00	3.47	10.38
	Warm Startup	20.00	0.86	62.50	3.47	10.38
	Hot Startup	20.00	0.86	100.0	3.47	10.38
10-Cell Cooling Tower <sup>3</sup>	Full Load					2.92
	Startup					2.92
Existing Boiler	Full Load	32.64	0.68	2.04	0.68	0.20
	Startup	2.51	0.05	0.16	0.05	0.02
4-Cell Cooling Tower <sup>4</sup>	Full Load					0.77
	Startup					0.06
Emergency IC Engine	Full Load	19.80	0.44	1.56	1.56	0.81
Firewater Pump	Full Load	1.98	0.063	0.53	0.31	0.10
<sup>1</sup> The turbine is at full load in 30 °F ambient air temperature without duct firing. <sup>2</sup> The turbine is at full load in 30 °F ambient air temperature with duct firing. <sup>3</sup> There are two 10-cell cooling towers associated with the turbines for heat rejection. <sup>4</sup> There are two 4-cell cooling towers associated with the boilers for heat rejection.						

Source: (MVPC 2000a)

**AIR QUALITY Table 12**  
**Estimated Turbine Annual Average Hourly Emission Rates**  
**(lbs/hour)**

Temperature (°F)	Duct Firing	NOx <sup>1</sup>	SOx	CO <sup>2</sup>	VOC	PM10
102	On	6.56	1.31	7.98	3.19	11
82	On	6.66	1.33	8.11	3.24	11
59	Off	6.38	1.28	7.8	3.12	11
59	On	Na <sup>3</sup>	1.37	8.34	3.34	11
30	Off	6.62	1.32	8.06	3.24	11
30	On	7.13	1.42	8.65	3.47	11
<sup>1</sup> The NOx emission rates assume that the MVPP can achieve 1.0 ppm averaged over the entire year. <sup>2</sup> The CO emission rates assume that the MVPP can achieve 2.0 ppm averaged over the entire year. <sup>3</sup> The NOx emission rate for 59 °F with duct firing is not proposed to be used to calculate any longterm NOx emissions or impacts.						

Source: (MVPC 2000a)

## STARTUP

The MVPP has four general startup scenarios, black start, cold start, warm start and hot start. Black starting means that the power plant starts with no power from the grid. MVPC has stated that they will first start the emergency IC engine, then start the existing boilers (units 1 and 2) and finally start the combustion turbines (units 3 and 4). Black starting is a very unusual situation and is not expected to occur in the lifetime of the facility. Additionally, it is unusual to black start boilers, as opposed to black starting the turbines. Black starting the boilers requires a significant amount of power for the compressors, pumps and other associated equipment. That is why the IC engine is rated at 5,900 Bhp, which is unusually large. Black starting the turbines (one set at a time) maybe more complex for the facility as a whole, but it would relieve the facility of the need to use such a large IC engine (more along the lines of 500-1,000 Bhp). However, staff is unaware of any other facility in the United States that has both boilers and turbines operating together at such a high total facility capacity in conjunction with black start capability. Given that the boilers, once started, would likely be the most stable power producing equipment at the facility (as opposed to the turbines, which are easier to knock back offline during this process), staff has no objection to black starting the boilers prior to the turbines.

The emissions associated with black starting are very high because the generating equipment starts from a cold status. The duration of a black startup can exceed 9 hours for this facility due to the sequence of starts. Staff assumes that the boilers in this situation are relatively warm and can be re-started in three hours. Staff then follows the assumptions of cold startup (see below). Both turbines of unit 3 will startup at the same time, three hours later both turbines of unit 4 will begin their startup (for a total startup duration of six hours). During the time that the turbines are in startup, the boiler units will both be assumed at full load. AIR QUALITY Table 13 shows the likely emissions from black starting at the MVPP facility. Because black starting is an extremely unlikely event, staff will not further analyze this operational scenario.

**AIR QUALITY Table 13**  
**Black Startup Emission Estimate**  
**(pounds per event)**

Equipment	Operation	Duration (hours)	NOx	SOx	CO	VOC	PM10
Emergency Engine	Full Load	3	59.40	1.32	4.68	4.68	2.43
Boiler Unit 1	Startup	3	7.53	0.15	0.48	0.15	0.06
Boiler Unit 2	Startup	3	7.53	0.15	0.48	0.15	0.06
4-Cell Tower <sup>1</sup> Unit 1	Startup	3	--	--	--	--	0.18
4-Cell Tower <sup>1</sup> Unit 2	Startup	3	--	--	--	--	0.18
Boiler Unit 1	Full Load	6	195.84	4.08	12.24	4.08	1.20
Boiler Unit 2	Full Load	6	195.84	4.08	12.24	4.08	1.20
4-Cell Tower <sup>1</sup> Unit 1	Full Load	6	--	--	--	--	4.62
4-Cell Tower <sup>1</sup> Unit 2	Full Load	6	--	--	--	--	4.62
Unit 3 Turbine 1	Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 3 Turbine 2	Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 3 Turbine 1	Full Load <sup>2</sup>	3	49.77	3.96	72.60	9.72	33.00
Unit 3 Turbine 2	Full Load <sup>2</sup>	3	49.77	3.96	72.60	9.72	33.00
Unit 4 Turbine 1	Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 4 Turbine 2	Startup	3	60.00	2.58	150.00	10.41	31.14
10-Cell Tower <sup>3</sup> Unit 1	Full Load <sup>4</sup>	6 <sup>5</sup>	--	--	--	--	17.52
10-Cell Tower <sup>3</sup> Unit 2	Full Load <sup>4</sup>	3	--	--	--	--	8.76
Total from full stop to full load		<b>9</b>	<b>805.68</b>	<b>28.02</b>	<b>775.32</b>	<b>74.22</b>	<b>231.39</b>
Average emission rates (lbs/hour)			89.52	3.11	86.15	8.25	25.71
<sup>1</sup> This refers to the 4-cell cooling towers (2) that are associated with the boiler units. <sup>2</sup> The turbine is assumed to be at full load with the ambient air at 30 °F and the duct burners off. <sup>3</sup> This refers to the 10-cell cooling towers (2) associated with the four combustion turbines. <sup>4</sup> The emission rate for these cooling towers is assumed the same for startup and full load. <sup>5</sup> Unit 1 of the 10-cell cooling tower set will operate 3 hours longer due to the startup sequence, which calls for the unit 4 turbines to begin startup after unit 3 turbines have completed their startup.							

Cold startups usually occur after extended periods of shutdown, typically 7 days or more. The cold startup sequence assumes that the boilers are at full load and are supplying steam to the HRSG and steam turbines of CTG Units 3 and 4. MVPC has requested that they assume 36 hours of cold startups per year per turbine for the MVPP facility. AIR QUALITY Table 14 shows the estimated cold start emissions for the MVPP facility. Staff includes start up emissions from the existing boilers (units 1 & 2) and estimates their startup duration at 6 hours total. However, staff also includes emissions from the boilers units while they are at full load. Since the boilers and turbines will operate somewhat independently, the worst case 1-hour and worst case daily emissions will occur while the boilers are at full load and the turbines are in startup mode. The turbines unit 3 will be started first, followed by the turbines in unit 4 (for a total startup duration of 6 hours).

**AIR QUALITY Table 14**  
**Cold Startup Emission Estimate**  
**(pounds per event)**

<b>Equipment</b>	<b>Operation</b>	<b>Duration (hours)</b>	<b>NOx</b>	<b>SOx</b>	<b>CO</b>	<b>VOC</b>	<b>PM10</b>
Boiler Unit 1	Full Load	6	195.84	4.08	12.24	4.08	1.20
Boiler Unit 2	Full Load	6	195.84	4.08	12.24	4.08	1.20
4-Cell Tower <sup>1</sup> Unit 1	Full Load	6	--	--	--	--	4.62
4-Cell Tower <sup>1</sup> Unit 2	Full Load	6	--	--	--	--	4.62
Unit 3 Turbine 1	Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 3 Turbine 2	Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 3 Turbine 1	Full Load <sup>2</sup>	3	49.77	3.96	72.60	9.72	33.00
Unit 3 Turbine 2	Full Load <sup>2</sup>	3	49.77	3.96	72.60	9.72	33.00
Unit 4 Turbine 1	Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 4 Turbine 2	Startup	3	60.00	2.58	150.00	10.41	31.14
10-Cell Tower <sup>3</sup> Unit 1	Full Load <sup>4</sup>	6 <sup>5</sup>	--	--	--	--	17.52
10-Cell Tower <sup>3</sup> Unit 2	Full Load <sup>4</sup>	3	--	--	--	--	8.76
<b>Total from full stop to full load</b>		<b>6</b>	<b>731.22</b>	<b>26.40</b>	<b>769.68</b>	<b>69.24</b>	<b>228.48</b>
<b>Average emission rates (lbs/hour)</b>			<b>121.87</b>	<b>4.40</b>	<b>128.28</b>	<b>11.54</b>	<b>38.08</b>
<sup>1</sup> This refers to the 4-cell cooling towers (2) that are associated with the boiler units. <sup>2</sup> The turbine is assumed to be at full load with the ambient air at 30 °F and the duct burners off. <sup>3</sup> This refers to the 10-cell cooling towers (2) associated with the four combustion turbines. <sup>4</sup> The emission rate for these cooling towers is assumed the same for startup and full load. <sup>5</sup> Unit 1 of the 10-cell cooling tower set will operate 3 hour longer due to the startup sequence, which calls for the unit 4 turbines to begin startup after unit 3 turbines have completed startup.							

Warm startups occur generally after a shorter shutdown duration than those for cold startups, from 2 to 7 days. MVPC will still likely find it necessary to use some steam from the boilers to preheat the HRSG and steam turbines for CTG Units 3 & 4. Staff estimates the startup period to be approximately 2 hours for each turbine for a warm startup. MVPC requests that they have 96 hours of warm startups per year per turbine. AIR QUALITY Table 15 shows the estimated emissions for a warm startup at the MVPP. The turbines unit 3 will be started first, followed by the turbines in unit 4 (for a total startup duration of four hours).

**AIR QUALITY Table 15**  
**Warm Startup Emission Estimate**  
**(pounds per event)**

Equipment	Operation	Duration (hours)	Nox	SOx	CO	VOC	PM10
Boiler Unit 1	Full Load	4	130.56	2.72	8.16	2.72	0.80
Boiler Unit 2	Full Load	4	130.56	2.72	8.16	2.72	0.80
4-Cell Tower <sup>1</sup> Unit 1	Full Load	4	0.00	0.00	0.00	0.00	3.08
4-Cell Tower <sup>1</sup> Unit 2	Full Load	4	0.00	0.00	0.00	0.00	3.08
Unit 3 Turbine 1	Startup	2	40.00	1.72	125.00	6.94	20.76
Unit 3 Turbine 2	Startup	2	40.00	1.72	125.00	6.94	20.76
Unit 3 Turbine 1	Full Load <sup>2</sup>	2	33.18	2.64	48.40	6.48	22.00
Unit 3 Turbine 2	Full Load <sup>2</sup>	2	33.18	2.64	48.40	6.48	22.00
Unit 4 Turbine 1	Startup	2	40.00	1.72	125.00	6.94	20.76
Unit 4 Turbine 2	Startup	2	40.00	1.72	125.00	6.94	20.76
10-Cell Tower <sup>3</sup> Unit 1	Full Load <sup>4</sup>	4 <sup>5</sup>	0.00	0.00	0.00	0.00	11.68
10-Cell Tower <sup>3</sup> Unit 2	Full Load <sup>4</sup>	2	0.00	0.00	0.00	0.00	5.84
Total from full stop to full load		<b>4</b>	<b>487.48</b>	<b>17.60</b>	<b>613.12</b>	<b>46.16</b>	<b>152.32</b>
Average emission rates (lbs/hour)			81.25	2.93	102.19	7.69	25.39
<sup>1</sup> This refers to the 4-cell cooling towers (2) that are associated with the boiler units. <sup>2</sup> The turbine is assumed to be at full load with the ambient air at 30 °F and the duct burners off. <sup>3</sup> This refers to the 10-cell cooling towers (2) associated with the four combustion turbines. <sup>4</sup> The emission rate for these cooling towers is assumed the same for startup and full load. <sup>5</sup> Unit 1 of the 10-cell cooling tower set will operate two hour longer due to the startup sequence, which calls for the unit 4 turbines to begin startup after unit 3 turbines have completed startup.							

Hot startups generally occur following a trip off line or non-critical emergency shutdown, usually lasting only a few hours. The HRSGs and steam turbines are still warm, so there is no reason to use steam from the boilers to preheat them. Hot startups typically take approximately one hour to complete. MVPC is requesting 233 hours per year per turbine of hot startups. AIR QUALITY Table 16 shows the estimated emissions for a hot startup for the MVPP. The turbines unit 3 will be started first, followed by the turbines in unit 4 (for a total startup duration of 2 hours).

**AIR QUALITY Table 16**  
**Hot Startup Emission Estimate**  
**(pounds per event)**

Equipment	Operation	Duration (hours)	Nox	SOx	CO	VOC	PM10
Boiler Unit 1	Full Load	2	65.28	1.36	4.08	1.36	0.40
Boiler Unit 2	Full Load	2	65.28	1.36	4.08	1.36	0.40
4-Cell Tower <sup>1</sup> Unit 1	Full Load	2	--	--	--	--	1.54
4-Cell Tower <sup>1</sup> Unit 2	Full Load	2	--	--	--	--	1.54
Unit 3 Turbine 1	Startup	1	20.00	0.86	100.00	3.47	10.38
Unit 3 Turbine 2	Startup	1	20.00	0.86	100.00	3.47	10.38
Unit 3 Turbine 1	Full Load <sup>2</sup>	1	16.59	1.32	24.20	3.24	11.00
Unit 3 Turbine 2	Full Load <sup>2</sup>	1	16.59	1.32	24.20	3.24	11.00
Unit 4 Turbine 1	Startup	1	20.00	0.86	100.00	3.47	10.38
Unit 4 Turbine 2	Startup	1	20.00	0.86	100.00	3.47	10.38
10-Cell Tower <sup>3</sup> Unit 1	Full Load <sup>4</sup>	2 <sup>5</sup>	--	--	--	--	5.84
10-Cell Tower <sup>3</sup> Unit 2	Full Load <sup>4</sup>	1	--	--	--	--	2.92
Total from full stop to full load		<b>2</b>	<b>243.74</b>	<b>8.80</b>	<b>456.56</b>	<b>23.08</b>	<b>76.16</b>
Average emission rates (lbs/hour)			121.87	4.40	228.28	11.54	38.08
<p>1 This refers to the 4-cell cooling towers (2) that are associated with the boiler units.</p> <p>2 The turbine is assumed to be at full load with the ambient air at 30 °F and the duct burners off.</p> <p>3 This refers to the 10-cell cooling towers (2) associated with the four combustion turbines.</p> <p>4 The emission rate for these cooling towers is assumed the same for startup and full load.</p> <p>5 Unit 1 of the 10-cell cooling tower set will operate one hour longer due to the startup sequence, which calls for the unit 4 turbines to begin startup one hour after unit 3 turbines began startup.</p>							

## OPERATING EMISSIONS

Operating emissions for the MVPP include emission from the combustion turbines, the gas-fired HRSGs (duct firing) and the existing boilers. Emissions from the combustion turbine are susceptible to the ambient temperature. Generally speaking, the colder the ambient temperature is, the denser it is. Denser air results in a slightly higher power output and a higher volume throughput, which tends to result in higher emissions. MVPC investigated emission rates at several different ambient temperatures, with and without duct firing. They found that the highest emissions occur while the combustion turbine is at full load, the ambient temperature is 30 °F and the duct firing is on. For normal operations, the boilers and all four cooling towers are assumed to be at full load because that scenario is their highest emission state.

## MAXIMUM EXPECTED EMISSIONS

The maximum expected emissions for the MVPP are calculated on a hourly, daily and annual basis. AIR QUALITY Table 17 shows the hourly emissions and assume

that the boilers are at full load and the combustion turbines are in startup. The HRSG ducts are not fired during startup. AIR QUALITY: Table 18 shows the maximum daily emissions and assumes the existing boilers operating at full load and the new turbines starting up and then operating at full load for the balance of the day. The daily maximum emissions include one hour of operation from the emergency IC engine.

**AIR QUALITY Table 17**  
**Project Maximum Hourly Emissions**  
**(lbs/hr)**

<b>Equipment : Operation</b>	<b>NOx</b>	<b>SO2</b>	<b>CO</b>	<b>VOC</b>	<b>PM10</b>
Boiler Unit 1: Full Load	32.64	0.68	2.04	0.68	0.20
Boiler Unit 2: Full Load	32.64	0.68	2.04	0.68	0.20
Boiler Cooling Tower 1: Full Load	--	--	--	--	0.77
Boiler Cooling Tower 2: Full Load	--	--	--	--	0.77
CTG Unit 3: Turbine 1 Full Load w/Duct	17.77	1.42	25.91	3.47	11.00
CTG Unit 3: Turbine 2 Full Load w/Duct	17.77	1.42	25.91	3.47	11.00
CTG Unit 4: Turbine 1 Cold Startup	20.00	0.86	50.00	3.47	10.38
CTG Unit 4: Turbine 2 Cold Startup	20.00	0.86	50.00	3.47	10.38
CTG Cooling Tower 1: Full Load	--	--	--	--	2.92
CTG Cooling Tower 2: Full Load	--	--	--	--	2.92
<b>TOTAL</b>	<b>140.82</b>	<b>5.92</b>	<b>155.90</b>	<b>15.24</b>	<b>50.54</b>

**AIR QUALITY Table 18**  
**Project Daily Emissions**  
**(lbs/day)**

<b>Equipment : Operation</b>	<b>Duration</b>	<b>NOx</b>	<b>SO2</b>	<b>CO</b>	<b>VOC</b>	<b>PM10</b>
Boiler Unit 1: Full Load	24	783.36	16.32	48.96	16.32	4.80
Boiler Unit 2: Full Load	24	783.36	16.32	48.96	16.32	4.80
4-Cell Tower 1: Full Load	24	--	--	--	--	18.48
4-Cell Tower 2: Full Load	24	--	--	--	--	18.48
Unit 3 Turbine 1:Cold Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 3 Turbine 2: Cold Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 3 Turbine 1:Full Load	21	373.17	29.82	544.11	72.87	231.00
Unit 3 Turbine 2: Full Load	21	373.17	29.82	544.11	72.87	231.00
Unit 4 Turbine 1:Cold Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 4 Turbine 2:Cold Startup	3	60.00	2.58	150.00	10.41	31.14
Unit 4 Turbine 1:Full Load	18	319.86	25.56	466.38	62.46	198.00
Unit 4 Turbine 2:Full Load	18	319.86	25.56	466.38	62.46	198.00
10-Cell Tower 1: Full Load	24	--	--	--	--	70.08
10-Cell Tower 2: Full Load	21	--	--	--	--	61.32
Emergency IC Engine	1	19.80	0.44	1.56	1.56	0.81
<b>Total</b>	<b>24</b>	<b>3,212.58</b>	<b>154.16</b>	<b>2,720.46</b>	<b>346.50</b>	<b>1,161.33</b>

The annual emissions for the MVPP are summarized in the AIR QUALITY Table19. The annual emissions include 200 hours of operation from the emergency IC engine, 200 hours of operation from the firewater pump and 1915 hours of operation from the duct burners. The CTG Units are assumed to operate at full load for 8,395 hour per year with an additional 365 hours in startup mode per turbine. The boiler units are assumed to have 3,700 hours of operation per year with an additional 2,314 hours in startup combined, with the balance of time being down.

**AIR QUALITY Table 19**  
**Project Annual Emissions**  
**(tons per year [ton/yr])**

<b>Equipment</b>	<b>NOx</b>	<b>SOx</b>	<b>PM10</b>	<b>VOC</b>	<b>CO</b>
Turbines (total for all four) <sup>1</sup>	125.15	22.73	196.97	56.55	192.27
Boiler Unit 1 <sup>2</sup>	42.68	0.89	2.67	0.89	0.26
Boiler Unit 2 <sup>3</sup>	20.61	0.43	1.29	0.43	0.13
Cooling Towers (total for all four) <sup>4</sup>	0.00	0.00	0.00	0.00	27.07
Emergency Engine <sup>5</sup>	1.98	0.04	0.16	0.16	0.08
Firewater Pump <sup>5</sup>	0.20	0.01	0.05	0.03	0.01
<b>Total</b>	<b>190.62</b>	<b>24.09</b>	<b>201.14</b>	<b>58.05</b>	<b>219.82</b>
<p>1 Assumes each turbine has a total of 365 hours of startup divided as follows: 233 hours of hot starts, 96 hours of warm starts, 36 hours of cold starts. Also assumes each turbine operates at various ambient temperatures as follows: 20 hours at 102 °F and the dust burners on, 850 hours at 82 °F and the duct burners on, 3605 hours at 59 °F and the duct burners off, 2875 hours at 30 °F and the duct burners off, and 1045 hours at 30 °F with the duct burners on. Finally, assumes no down time for the turbines.</p> <p>2 Assumes 1495 hours of startup and 2500 hours of full load operation.</p> <p>3 Assumes 819 hours of startup and 1200 hours of full load operation.</p> <p>4 Assumes the 10-cell cooling towers at in startup for 365 hours and at full load for 8395 hours. Also assumes that unit 1 of the 4-cell cooling towers is in startup for 1495 hours and at full load for 2500 hours. Also assumes that unit 2 of the 4-cell cooling towers is in startup for 819 hours and at full load for 1200 hours.</p> <p>5 Assumes 200 hours of full load operation</p> <p>For more information see Appendix B.</p>					

## **AMMONIA EMISSIONS**

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. MVPC has committed to an ammonia slip no greater than 5 ppm, which is the current lowest ammonia slip level being permitted throughout California. On a daily basis, the ammonia slip of 5 ppm is equivalent to approximately 323 lb./day of ammonia emitted into the atmosphere per turbine.

It should be noted that the ammonia slip of 5 ppm is usually associated with the degradation of the SCR catalyst, usually in a time frame of two 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, corresponding to a mass emissions of approximately 60 to 125 pounds per day per turbine. The implications of these ammonia emissions are discussed later in this analysis.

## INITIAL COMMISSIONING

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The initial commissioning of a power plant refers to the time frame between completion of construction and the consistent production of electricity for sale on the market. Normal operating emission limits usually do not apply during initial commissioning procedures. The turbines used at the MVPP will go through several layers of test during initial commissioning. During the first set of tests, post-combustion control will not be operational (ie., the SCR and oxidation catalyst). MVPC plans to put two turbines through the initial commission phase at a time. Once the first set of turbines has completed the initial commissioning phase, the second set of turbines will begin.

These tests start with a Full Speed-No Load test. This test runs the turbine at approximately 20% of its maximum heat input rate. Components tested include the ignition system, synchronization with the electric generator and the turbine overspeed safety system. This test is expected to last approximately 5 days.

Part Load testing runs the turbines to approximately 60% of the maximum heat input rating over a 6 day period. During this test the turbine and HRSG will be tuned to minimize emissions and the HRSG steam lines will be checked.

Full Load testing runs the turbines to approximately 100% of their maximum heat input rate and lasts approximately 4 days. This testing entails further tuning of the turbine and HRSG as well as the steam lines.

Full Load – Partial SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia injection grid for the first time. This testing is expected to last approximately 5 days.

Finally, Full Load – Full SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia inject grid at its full capacity. It is during this test that the SCR system will be completely tuned and operating at design levels (ie., NOx control at 2.5 ppm). This test is expected to take approximately 14 days for a pair of turbines.

Total initial commissioning for one set of turbines is expected to require approximately 33 days (ie., 66 days for all four turbines at the MVPP). AIR QUALITY Table 20 shows the expected emissions from the initial commissioning of all four turbines in the MVPP.

**AIR QUALITY Table 20**  
**Initial Commissioning Emissions Estimate**

	<b>NOx</b>	<b>CO</b>	<b>VOC</b>	<b>SOx</b>	<b>PM10</b>
Maximum Hourly Emissions (lbs/hr)	189	411	7	2	22
Maximum Daily Emissions (lbs/day)	2,265	4,931	83	20	264
<b>Total Initial Commissioning Emissions (lbs)</b>	<b>69,284</b>	<b>223,158</b>	<b>4,447</b>	<b>1,391</b>	<b>14,256</b>

Source (MVPC 2000ff)

## **FACILITY CLOSURE**

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Eventually the WVPP will close, either as a result of the end of its useful life, 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.

The Permit to Operate, issued by the District, is required for operation of the facility and is usually renewed on a five year schedule. However, during those five years, the applicant must still pay permit fees annually. If the applicant chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant pays the fees to renew the Permit to Operate.

If MVPC 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 MSCC plans to demonstrate compliance with the District Rules regarding fugitive dust emission limitations.

## **PROJECT INCREMENTAL IMPACTS**

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### **MODELING APPROACH**

MVPC 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 refined modeling.

## CONSTRUCTION IMPACTS

MVPC performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the construction activity and combustion emissions from the equipment. The emissions used in the analysis were the highest emissions of a particular pollutant during a one month period, converted to a gram per second emission rate for the model. Most of the highest emissions occurred during the 2<sup>nd</sup> and 7<sup>th</sup> month of the 20-month construction period.

The results of this modeling effort are shown in AIR QUALITY Table 21. They show that the construction activities would cause a violation of the state 1-hour average NO<sub>2</sub> standard and further exacerbate existing violations of the state 24-hour and annual average PM<sub>10</sub> standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site.

**AIR QUALITY Table 21**  
**Maximum Construction Impacts**

Pollutant	Averaging Time	Impact (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> ) <sup>1</sup>	Total Impact (µg/m <sup>3</sup> )	Limiting Standard (µg/m <sup>3</sup> )	Percent of Standard
NO <sub>2</sub> <sup>2</sup>	1-hour <sup>3</sup>	516	263.2	779.2	470	<b>166</b>
	Annual <sup>4</sup>	24	67.54	91.54	100	92
CO <sup>2</sup>	1-hour	1520	5750	7270	23,000	32
	8-hour	836	4444	5280	10,000	53
SO <sub>2</sub> <sup>2</sup>	1-hour	35	52.4	87.4	655	13
	24-hour	6	28.9	34.9	130	27
	Annual	1	4.8	5.8	80	7
PM <sub>10</sub> <sup>5</sup>	<b>24-hour</b>	62	148	210	50	<b>420</b>
	<b>Annual</b>	24	50.6	74.6	30	<b>249</b>
<sup>1</sup> See AIR QUALITY Table 5. <sup>2</sup> Based on daily emission during month 7. <sup>3</sup> Employs ozone limiting method. <sup>4</sup> Employs ARM method, default district ratio of 0.71. <sup>5</sup> Based on daily emissions during month 2						

Source: Response to data request # 15

Since the general public live and work in the vicinity of the project site, the construction of the MVPP may result in unavoidable short-term impacts that may expose the general public to adverse air quality conditions. Thus, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the NO<sub>2</sub> and PM<sub>10</sub> 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 fumigation meteorological conditions, and during the facility start-up (assuming 50% load) and steady-state operations.

### ***FUMIGATION IMPACTS***

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.

The applicant used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts. AIR QUALITY Table 22 shows the modeled fumigation results and impacts on the 1-hour NO<sub>2</sub>, CO and SO<sub>2</sub> standards. Since fumigation impacts will not typically occur much beyond a 1-hour period, only impacts on these 1-hour standards were addressed. The results of the modeling analysis show that fumigation impacts at either partial load (50 percent) or full load will not violate the NO<sub>2</sub>, CO or SO<sub>2</sub> 1-hour standards.

**AIR QUALITY Table 22**  
**Facility Fumigation Modeling Maximum 1-Hour Impacts**

Pollutant	Impact <sup>1</sup> (µg/m <sup>3</sup> )	Background <sup>2</sup> (µg/m <sup>3</sup> )	Total Impact (µg/m <sup>3</sup> )	Limiting Standard (µg/m <sup>3</sup> )	Percent of Standard
NO <sub>2</sub>	6.30	263.2	269.5	470	57
CO	9.30	5750	5759.3	23,000	25
SO <sub>2</sub>	0.50	52.4	52.9	655	8
1 Impacts include emissions from all four turbines					
2 See AIR QUALITY Table 5					

### ***OPERATIONAL MODELING ANALYSIS***

The MVPC provided staff with a modeling analysis, using the ISCST3 model to quantify the potential impacts of the project for both turbines, during normal steady state operation and during start-up conditions. This modeling analysis consisted of a screening level and a refined level analysis. The screening level analysis tested 10 basic operating conditions, which combined various load levels and duct burner operations with several ambient air temperatures. The refined modeling was developed from these screening level runs. The screening level runs showed that

the highest impacts occur for short-term averaging periods (24 hours or less) when the boilers (units 1 and 2) and the turbines unit 3 are at full load, while the turbines in unit 4 are in cold start, with the emergency generator operating. The annual impacts (PM10) include the combustion turbines, the boilers, the emergency engine, the firewater pump and the cooling towers in both startup and full load operation. These impacts are shown in AIR QUALITY Table 23.

The project's PM10 impacts could contribute to existing violations of the state 24-hour and annual average PM10 standards. Because of the conservatism of the air dispersion model itself, staff believes that the actual impacts from the project would be somewhat less than the projected modeled impacts shown in AIR QUALITY Table 23.

**AIR QUALITY Table 23**  
**Facility Modeling Maximum Impacts**

Pollutant	See AIR QUALITY Table #	Averaging Time	Impact ( $\mu\text{g}/\text{m}^3$ )	Back-Ground <sup>1</sup> ( $\mu\text{g}/\text{m}^3$ )	Total Impact ( $\mu\text{g}/\text{m}^3$ )	Limiting Standard ( $\mu\text{g}/\text{m}^3$ )	Percent of Standard
NO <sub>2</sub>	17	1-hour	74.0	263.2	337.2	470	72
	19	Annual	0.61	67.54	68.15	100	68
CO	17	1-hour	34.1	5750	5784.1	23,000	25
	17	8-hour	11.5	4444	4455.5	10,000	45
SO <sub>2</sub>	17	1-hour	2.50	52.4	54.9	655	8
	18	24-hour	0.29	28.9	29.19	130	22
	19	Annual	0.08	4.8	4.88	80	6
PM <sub>10</sub>	18	<b>24-hour</b>	10.10	148	158.1	50	<b>316</b>
	19	<b>Annual</b>	2.01	50.6	52.61	30	<b>175</b>
Note: The applicant has recently changed the exhaust stack of the emergency IC engine and will be required to resubmit new modeling to reflect this change.							
1 See AIR QUALITY Table 5							

The meteorological data used in the ISCST3 model was a single year from one station. This is atypical for an air dispersion modeling analysis. Typically, the applicant uses 5 years of the most recent meteorological data available. However, in this case the District requires the use of specific meteorological data files that they have examined and corrected for modeling purposes. Generally the District followed the EPA guidelines for correcting errors or missing data in the meteorological data file. This meteorological data was taken from the Redlands monitoring station in 1981 (19 years old). Staff was initially concerned that since this is a single year, the meteorological data might result in low impacts for the modeling effort. However, the CAPCOA Risk Assessment Guidelines for Dry Cleaners (CAPCOA 2000) used this same meteorological data as well as other meteorological data from California and the rest of the United States. The modeling

results of the Risk Assessment Guidelines show that the Redlands 1981 meteorological data produce the highest impacts of any other meteorological data using the same type of emission sources. Therefore, staff believes that it is reasonable to base the ISCST3 modeling solely on the Redlands 1981 meteorological data.

## **SECONDARY POLLUTANT IMPACTS**

The project's gaseous emissions of NO<sub>x</sub>, SO<sub>2</sub>, VOC and ammonia can contribute to the formation of secondary pollutants, ozone and PM<sub>10</sub>. 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 NO<sub>x</sub> and VOC emissions to ozone formation, it can be said that the emissions of NO<sub>x</sub> and VOC from the MVPP do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

Secondary PM<sub>10</sub> formation, as discussed earlier is the process of conversion from gaseous reactants to particulate products. 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 are no agency (EPA or CARB) recommended models or procedures for estimating nitrate or sulfate formation.

Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO<sub>2</sub> and NO<sub>x</sub>. The data from these studies can be used to approximate the conversion of SO<sub>2</sub> and NO<sub>x</sub> to particulate. This can be done by using an aggregate conversion factor (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model is run with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO<sub>2</sub> and NO<sub>2</sub> that is converted to particulate. This approach is an oversimplification of a complex process; nevertheless, given the stringency of the PM<sub>10</sub> standards, and the need to address interpollutant conversion rates in setting offset ratios, for interpollutant trading, staff believes this issue needs to be addressed.

Alternatively, ambient background information exists in the area near the project site that would allow an estimate of the predicted ammonium nitrate formation. The information was measured by the District in a 1995 dairy impact study that was intended to estimate the impacts of dairy farming (a significant source of ammonia) on ambient secondary PM<sub>10</sub> formation. The results would have to be restricted to an annual average as the nitrate formation reaction is very dependent on ambient conditions. Staff intends to make these calculations available at a later date (see Appendix A for more information).

## **CUMULATIVE IMPACTS**

To evaluate reasonably foreseeable future projects as part of a cumulative impacts analysis, staff needs specific and timely information. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when the project applicant has submitted an application

to the District for a permit. Air dispersion modeling required by the District would necessitate that the applicant develop the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those probable future projects in our cumulative impacts analysis that are currently under construction, or are currently under District review. Projects located up to six miles from the proposed facility site usually need to be included in the analysis.

The MVPC has submitted a cumulative analysis, which includes an estimate on regional and local impacts from the MVPP. Staff was unable to closely review the MVPC protocol for the cumulative analysis. The protocol is insufficient in staff's opinion. MVPC has been informed as to the nature of the insufficiencies, for which they are currently seeking remedies.

## **VISIBILITY IMPACTS**

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NO<sub>x</sub>) and particulate (PM<sub>10</sub>) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 areas to the MVPP site are the Aqua Tibia Wilderness area, the Cucamonga Wilderness area, the Joshua Tree National Park, The San Gabriel Wilderness Area, the San Gorgonia Wilderness area and the San Jacinto Wilderness area. MVPC used the EPA approved model ISCST3 to assess the project's visibility impacts. The results from the VISCREEN modeling analysis indicated that the project's visibility impacts would be below the significance criteria for contrast and perception. Therefore the project's visibility impacts on these Class 1 areas are considered insignificant.

## **MITIGATION**

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### **APPLICANT'S PROPOSED MITIGATION**

#### ***CONSTRUCTION MITIGATION***

MVPC proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from MVPC that follow this section take these control measures into consideration.

To control exhaust emissions from heavy diesel construction equipment

- Limit engine idle time and shutdown equipment when not in use.
- Perform regular preventative maintenance to reduce engine problems.
- Use CARB Low-Sulfur fuel for all heavy construction equipment.
- Ensure that all heavy construction equipment complies with EPA 1996 Diesel standards.

To control fugitive dust emissions

- Use water application or chemical dust suppressant on unpaved travel surfaces and parking areas.
- Use vacuum or water flushing on paved travel surfaces and parking areas.
- Require all trucks hauling loose material to either cover or maintain a minimum of two feet of freeboard.
- Limit traffic speed on unpaved roads to 25 mph.
- Install erosion control measures.
- Re-plant disturbed areas as soon as possible.
- Use gravel pads and wheel washers as needed.
- Use wind breaks and chemical dust suppressant or water application to control wind erosion from disturbed areas.

## ***OPERATIONS MITIGATION***

The MVPP's air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NO<sub>x</sub> emissions, MVPC proposes to use dry-low NO<sub>x</sub> combustors in the CTGs and a Selective Catalytic Reduction system with an ammonia injection grid.

To reduce CO and VOC emissions, MVPC proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. PM<sub>10</sub> emissions will be limited by the use of a clean burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO<sub>2</sub> emissions.

## **COMBUSTION TURBINE**

### ***Dry Low-NO<sub>x</sub> Combustors***

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NO<sub>x</sub> formed during combustion. Because of the expense and efficiency losses due to steam or water injection in the combustor cans to reduce combustion temperatures and the formation of NO<sub>x</sub>, CTG manufacturers are presently choosing to limit NO<sub>x</sub> formation through the use of dry low-NO<sub>x</sub> technologies. The GE version of the dry low-NO<sub>x</sub> combustor is a four-stage ignition system. Initially the fuel/air mixture is ignited in two independent combustors (0% to 35% load). Then the startup sequence moves to a lean-lean operation (35% to 70% load) where the center burner is engaged as well. Then second stage burning is begun and all the fuel is directed to the center burner. The second stage burning is a transient event while proceeding to the premixed phase. Premixed operation (70% and 100% load) has fuel being pumped to all burners, but ignition only in the center burner.

In this process, firing temperatures remain somewhat low, thus minimizing NO<sub>x</sub> formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NO<sub>x</sub> concentrations entering the HRSG are 25 ppm

corrected to 15 percent O<sub>2</sub>. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 5 ppm at 100 percent load.

## **FLUE GAS CONTROLS**

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. MVPC is proposing two catalyst systems, a selective catalytic reduction system to reduce NO<sub>x</sub>, and an oxidizing system to reduce CO.

### ***Selective Catalytic Reduction (SCR)***

Selective catalytic reduction refers to a process that chemically reduces NO<sub>x</sub> by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NO<sub>x</sub> rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100°F.

Catalysts generally operate between 600 to 750°F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600°F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770°F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO<sub>x</sub> to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

MVPC proposes to use a combination of the dry low-NO<sub>x</sub> combustors and SCR system to produce a NO<sub>x</sub> concentration exiting the HRSG stack of 2.5 ppm, corrected to 15 percent excess oxygen averaged over a 1-hour period.

### ***Oxidizing Catalyst***

To reduce the turbine carbon monoxide (CO) emissions, MVPC proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO<sub>2</sub>). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to 6 ppm, corrected to 15 percent excess oxygen and averaged over 1-hour.

## COOLING TOWER

Cooling tower drift consists of small water droplets, which contain particulate matter that originate from the total dissolved solids in the circulating water. To limit these particulate emissions, drift eliminators are installed in the cooling tower to capture these water droplets. MVPC intends to use drift eliminators on the cooling tower, with a design efficiency of 0.0006 percent. This is a very high level of efficiency for cooling tower drift eliminators. Similar cooling tower designs have been used successfully by a number of other projects licensed by the Energy Commission in recent years.

## EMISSION OFFSETS

The MVPC has provided a significant amount of emission reduction credits (ERCs) and RECLAIM trading credits (RTCs) to offset the project impacts. ERCs were provided for CO, VOC, SOX and PM10 emissions, while RTCs were provided for NOx emissions. There were insufficient PM10 ERCs to fully offset the MVPP PM10 emissions, therefore MVPC proposed (with the District) to trade SOx ERCs for PM10 emissions at a 2:1 ratio (i.e., 2 pounds of SOx for each pound of PM10). AIR QUALITY Table 24 through 27 shows the ERC certificate number, Company, city of origin and the quantity of pollutant purchased for CO, SOx, VOC and PM10. The quantity purchased is in terms of pounds per day via District banking rules. AIR QUALITY Table 27 shows that one purchase of a PM10 ERC is still pending, the District has indicated that there will likely be no opposition to this purchase on their part but that they are still reviewing it.

**AIR QUALITY Table 24**  
**Carbon Monoxide Emission Reduction Credits Procured**  
**for the**  
**Mountainview Power Project Emission Offsets**

Certificate Number	Company	City	Amount (lbs/day)
AQ001463	Alumax Mill Products Inc	Riverside	56
AQ001404	Central Plants Inc	Los Angeles	13
AQ002080	Central Plants Inc	Santa Fe Springs	671
AQ002370, 2372	Rhodia Inc	Carson	30
AQ000979	GWF Power Systems Co.	Newhall	26
AQ002768, 2815	National Offsets	Vernon	11
AQ001481	Granite Construction Co.	Indio	340
AQ001782	Unocal Corp.	Brea	232
<b>Total Emission Reduction Credits</b>			<b>1,379</b>

(MVPC 2000nn)

**AIR QUALITY Table 25**  
**Sulfur Dioxide Emission Reduction Credits Procured**  
**for the**  
**Mountainview Power Project Emission Offsets**

Certificate Number	Company	City	Amount (lbs/day)
AQ002238	Signal Hill Holding Corp.	Carson	47
AQ000349	GAF Building Materials	Irwindale	114
AQ003046	GAF Building Materials	Irwindale	48
AQ001121	California Steel Industries, Inc	Fontana	50
AQ000563	Miller Brewing	Irwindale	378
AQ000542	California Amforge	Azusa	17
AQ001377	Alcoa	Vernon	88
AQ000333	Technicolor Inc	North Hollywood	4
AQ000668	Hughes Aircraft Company	El Segundo	9
<b>Total Emission Reduction Credits</b>			<b>755</b>

(MVPC 2000nn)

**AIR QUALITY Table 26**  
**Volatile Organic Compounds Emission Reduction Credits Procured**  
**for the**  
**Mountainview Power Project Emission Offsets**

Certificate Number	Company	City	Amount (lbs/day)
AQ002700	Crown Beverage Packaging Inc	Van Nuys	121
AQ002705	Alumax Mill Products Inc	Riverside	201
AQ001405	Central Plants Inc	Los Angeles	13
AQ001447	Central Plants Inc	Santa Fe Springs	207
<b>Total Emission Reduction Credits</b>			<b>542</b>

(MVPC 2000nn)

**AIR QUALITY Table 27**  
**PM10 Emission Reduction Credits Procured**  
**for the**  
**Mountainview Power Project Emission Offsets**

Certificate Number	Company	City	Amount (lbs/day)
AQ000765	March AFB	South Gate	10
AQ002594	Internat'l Light Metals/Lockheed	Los Angeles	262
AQ002627	Equilon Enterprises	Carson	100
AQ001545	Owens Brockway Glass	Pomona	60
AQ002523	Alumax	Riverside	96
AQ002371	Rhodia Inc	South Gate	3
AQ000545	Southern California Gas Co	Monerey Park	6
AQ002709	Equilon Enterprises	Carson	165
AQ000669	Hughes Aircraft	El Sugundo	25
AQ000011	Firma Inc	South Gate	12
AQ001909	Kiewit-Granite	Hemet	1
AQ002097	Kiewit-Granite	Hemet	26
AQ001910	Kiewit-Granite	Hemet	5
AQ002054, 2256	Kiewit-Granite	Hemet	32
AQ002506	NI Industries	Vernon	4
AQ000376	GE-Energy and Env. Research	Santa Anna	7
AQ002828	National Offset		3
AQ000615	Deluxe Laboratories Inc	Hollywood	11
<b>PENDING</b>	Atkinson, Washington, Zachry	Winchester	105
AQ000350	GAF Building Products	Irwindale	4
AQ000149	Rhodia Inc	Los Angeles	1
AQ000232	Benjamin Moore	Commerce	4
<b>Total Emission Reduction Credits</b>			<b>942</b>

(MVPC 2000nn)

AIR QUALITY Table 28 shows the RTCs purchased for the MVPP. This table shows the zone and cycle of each RTC. The zone refers generally to the location and allowable effective area for an RTC. In the case of MVPP, they may use either zone 1 or 2. The cycle refers to the time frame within a year that a RTC is effective. Cycle 1 RTCs are effective from January through December, while cycle 2 RTCs are effective from July through December. The District requires that the applicant purchase enough RTCs to offset the project NOx emissions for the first year of operation. For the MVPP this will be the year 2003. To calculate the RTCs offsets in any year the District adds the total cycle 1 and cycle 2 RTCs from the current year, the cycle 2 RTCs of the previous year and the cycle 1 RTCs of the next year. The adequacy of these ERCs and RTCs will be discussed in the "ADEQUACY OF PROPOSED MITIGATION" section below. The calculation of these RTCs and ERCs will be discussed in the LORS Compliance section of this analysis.

**AIR QUALITY Table 28**  
**Nitrogen Oxides RECLAIM Trading Credits Procured**  
**for the**  
**Mountainview Power Project Emission Offsets**  
**(Pounds/Year)**

Year	RTC	RTC	RTC	RTC	RTC	RTC	RTC	Subtotal for Cycle 1	RTC	RTC	RTC	RTC	RTC	RTC	RTC	Subtotal for Cycle 2	Total
Zone	2	1	1	1	1	1	1		1	1 or 2	1	1	2	1	1		
Cycle	1	1	1	1	1	1	1		2	2	2	2	2	2	2		
2000		10000						10000								0	40000
2001					30000			30000	3100	200						3300	88519
2002		25219			30000			55219	3100	1500						<b>4600</b>	145115
<b>2003</b>	2000	20000	5000	13646	30000	11350		<b>81996</b>	3100	3000	15000	15000	20750	7120	58800	<b>122770</b>	<b>294688</b>
2004	5326	20000	5000	13646	30000	11350		<b>85322</b>	3100	3000	15000	15000	20750	7120	58800	122770	566184
2005	5326	20000	5000	13646	30000	11350	150000	235322	3100	3000	15000	15000	20750	7120	58800	122770	716184
2006	5326	20000	5000	13646	30000	11350	150000	235322	3100	3000	15000	15000	20750	7120	58800	122770	716184
2007	5326	20000	5000	13646	30000	11350	150000	235322	3100	3000	15000	15000	20750	7120	58800	122770	716184
2008	5326	20000	5000	13646	30000	11350	150000	235322	3100	3000	15000	15000	20750	7120	58800	122770	716184
2009	5326	20000	5000	13646	30000	11350	150000	235322	3100	3000	15000	15000	20750	7120	58800	122770	716184
2010	5326	20000	5000	13646	30000	11350	150000	235322	3100	3000	15000	15000	20750	7120	58800	122770	716184
2010+	5326	20000	5000	13646	30000	11350	150000	235322	3100	6592	15000	15000	20750	7120	58800	126362	484454

(MVPC 2000nn)

## **ADEQUACY OF PROPOSED MITIGATION**

### ***CONSTRUCTION MITIGATION***

Staff finds that the mitigation proposed of fugitive dust control is reasonable and will mitigate the impacts from fugitive dust to the extent feasible. However, staff finds that there are further mitigation measures possible for the control of combustion emissions from construction equipment. These additional mitigation measures are discussed in the Staff Proposed Mitigation section below.

### ***OPERATIONS MITIGATION***

#### **EMISSION CONTROLS**

MVPC has proposed, in their opinion, all practical and technically feasible mitigation measures to limit NO<sub>x</sub> emissions from the combustion turbines to 2.5 ppm over a 1-hour average. In addition, they propose to use an oxidizing catalyst to limit CO emissions to 6 ppm over a 1-hour period, which will also limit VOC emissions to 1.4 ppm over a 1-hour period.

MVPC's use of drift eliminators with an efficiency of 0.0006 percent represent the state-of-the-art of drift eliminator design. To our knowledge, commercially available drift eliminators with even higher efficiency, which could further reduce the cooling tower's PM<sub>10</sub> emissions, are not available.

#### **OFFSETS**

The emission reduction credits (ERCs) and RECLAIM trading credits (RTCs) identified in AIR QUALITY Tables 24 through 28 are intended to mitigate the MVPP air quality impacts. The amount of ERCs determined necessary for the MVPP (the ERC liability) is based on the daily average of the worst case month. In the case of MVPP this is most likely to be in the August time frame. The directive from the District is to calculate the total expected monthly emissions from the MVPP for August and divide that total by 30 (days per month) to determine the daily average. These calculations will be shown in more detail in the "Compliance with LORS" section of this analysis. The significant difference between the determination of the ERC liability required by the District and that shown in AIR QUALITY Table 29 is the inclusion of the new boiler emissions (above historic background emissions), the emergency IC engine, the firewater pump and the cooling towers. The Historic boiler emissions, shown in AIR QUALITY Table 29, are based on actual measured emissions from the facility for the RECLAIM program. It is staff's opinion that the applicant should not be held responsible for these emissions and thus they are discounted from the ERC liability calculation (see Net liability column). The MVPC could not procure enough PM<sub>10</sub> ERCs to mitigate the MVPP air quality impacts. Therefore, MVPC proposed, with the District, to trade SO<sub>x</sub> ERCs for MVPP PM<sub>10</sub> emissions at a 2:1 ratio.

**AIR QUALITY Table 29**  
**Comparison of Expected Annual Emissions to Offsets Provided**  
**(tons/year)**

	Annual Liability <sup>1</sup>	Historic Boiler Annual Emissions <sup>2</sup>	Net Liability	RTC or ERC Procured <sup>3</sup>	Remaining Liability	Convert SOx to PM10 <sup>4</sup>	Final Liability
NOx	190.62	36.10	154.51	147.34	7.17		7.17
CO	201.14	0.79	200.35	251.67	-51.32		-51.32
VOC	58.05	0.26	57.79	98.92	-41.13		-41.13
SOx	24.09	0.26	23.83	137.79	-113.96		-113.96
PM10	219.82	0.08	219.75	171.92	47.83	56.98	-9.15
<sup>1</sup> See AIR QUALITY Table 19 <sup>2</sup> Based on emissions reported in RECLAIM from September 1998 to August 1999. <sup>3</sup> Based on summary of current status of RTCs and ERCs, September 21, 2000. <sup>4</sup> Assuming a 2:1 ratio of SOx to PM10.							

AIR QUALITY Table 29 shows that the ERCs provided adequately mitigate the MVPP air quality impacts with the exception of NOx. The NOx RTCs fell short of mitigating the MVPP air quality impacts by 7.17 tons per year. Since it is unlikely that the MVPP will cause or contribute to an exceedance of the NO<sub>2</sub> ambient air quality standards (see Incremental Impacts section), ozone and secondary PM10 impacts become our primary concerns. Since the MVPC provided an excess of VOC ERCs (41.13 tons/year), which can also contribute to ozone and secondary PM10 impacts. Therefore, it is staff's opinion that the excess VOC ERCs should be reasonable expected to mitigate the remaining NOx emission impacts.

AIR QUALITY Table 30 compares the RTCs and ERCs provided to the expected worse case daily emissions. The significant difference between Table 29 and 30 is the assumption concerning the historic boiler emissions. In the case of annual emissions, the boilers do not run each day. In the worse case daily emissions, the boilers run for the entire 24 hour period, thus relieving a higher percentage of NOx liability than in the annual case. AIR QUALITY Table 30 shows that the CO ERCs fall short of fully offsetting the CO emissions from MVPP by 1,284 lbs/day. This is due to the assumption MVPC used to determine the worse month daily average CO liability as compared to staff assumptions for the worst case daily emissions. MVPC assumed that the MVPP could, on a monthly basis, achieve a 2.0 ppm CO emission rate. Staff assumes that the worst case daily CO emission will be 6.0 ppm. Because CO emissions from MVPP will be monitored by a continuous emission monitoring system (CEM), a 2.0 ppm monthly average and a 6.0 ppm hourly average can both be verified. Additionally, the Incremental Impacts section shows there is very little possibility that MVPP will cause or contribute to an impact on the ambient air quality standards for CO. Therefore, staff finds there to be no compelling reason for MVPC to provide further mitigation for their CO emission impacts.

**AIR QUALITY Table 30**  
**Comparison of Expected Daily Emissions to Offsets Provided**  
**(pounds/day)**

	Daily Liability <sup>1</sup>	Historic Boiler Daily Emissions <sup>2</sup>	Net Liability	RTC Or ERC Procured <sup>3</sup>	Remaining Liability	Convert SOx to PM10 <sup>4</sup>	Final Liability
NOx	3,213	2,646	566	807	-241		-241
CO	2,720	58	2,663	1,379	1,284		1,284
VOC	347	19	327	542	-215		-215
SOx	154	19	135	755	-620		-620
PM10	1,161	6	1,156	942	214	310	-96
<p>1 See AIR QUALITY Table 18</p> <p>2 Based on emission factors consistent with emissions reported in RECLAIM from September 1998 to August 1999 and assuming 24 hours of operation.</p> <p>3 Based on summary of current status of RTCs and ERCs, September 21, 2000.</p> <p>4 Assuming a 2:1 ratio of SOx to PM10.</p>							

## STAFF PROPOSED MITIGATION

### CONSTRUCTION MITIGATION

The modeling assessment discussed earlier shows that the combustion sources used for heavy construction have the potential for causing significant air quality impacts. After responding to a staff data request directing MVPC to investigate 11 different mitigation options, MVPC has determined that the following options are reasonable mitigation measures that they will consider further but have not agreed to at this time.

- Timing retardation on older diesel construction equipment that does not use a fuel injection system (referred to as a common rail).
- Employ where possible construction equipment that uses the common rail, high-pressure fuel injection system.
- Ensure that all on-road gasoline powered vehicles are equipped with a catalytic converter.
- Ensure that idle time on all diesel power construction equipment is minimized to less than 5 minutes.
- Employ oxidizing soot filters and oxidation catalysts where applicable.

Staff proposes Conditions of Certification AQ-C1 and AQ-C2 to be considered with these mitigation measures.

## ***OPERATIONS MITIGATION***

Staff will reserve judgement of the completeness of the proposed operation mitigation (both the emission levels and the offsets) until the District has released the preliminary Determination of Compliance.

## **COMPLIANCE WITH LORS**

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### **FEDERAL**

The District has not yet issued a preliminary Prevention of Significant Deterioration (PSD) permit as part of their Determination of Compliance for the MVPP.

### **STATE**

MVPC will demonstrate that the MVPP will comply with Section 41700 of the California State Health and Safety Code when the District issues the Determination of Compliance and the CEC staff's affirmative finding for the project.

### **LOCAL**

Staff will relate the compliance status of the MVPP with District rules after the preliminary Determination of Compliance has been issued.

## **CONCLUSIONS AND RECOMMENDATIONS**

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Staff can make no conclusions until after the revised cumulative analysis has been completed and the District has released the preliminary Determination of Compliance (PDOC). Staff expects the MVPC to issue the cumulative analysis at a later date. Once the District has released the PDOC, staff will issue a revised analysis that incorporates both the cumulative analysis and the conditions within the PDOC.

However, to facilitate the process of licensing the MVPP, staff recommends the following construction related conditions of certification (AQ-C1 through 3).

## CONDITIONS OF CERTIFICATION

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**AQ-C1** The project owner shall require as a condition of its construction contracts that all contractors/subcontractors ensure that all heavy earthmoving equipment, that includes, but is not limited to bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. The project owner shall further require as a condition of its construction contracts that this equipment shall employ high pressure fuel injection (common rail) system or engine timing retardation to control the emissions of oxides of nitrogen. The project owner shall further require as a condition of its construction contracts that all heavy construction equipment to the extent practical shall remain running at idle for no more than 5 minutes.

**Verification:** The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that the contractor's/subcontractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain construction contracts on the site for six months following the start of commercial operation.

**AQ-C2** The project owner shall install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or associated linear construction sites. Where the oxidizing soot filter is determined to be unsuitable, the owner shall install and use an oxidation catalyst. Suitability is to be determined by an independent California Licensed Mechanical Engineer who will stamp and submit for approval an initial and all subsequent Suitability Reports as necessary containing at a minimum the following:

### **Initial Suitability Report:**

- a list of all fuel burning, construction related equipment used,
- a determination of the suitability of each piece of equipment to firstly work appropriately with an oxidizing soot filter,
- a determination of the suitability of each piece of equipment to secondly work appropriately with an oxidation catalyst,
- if a piece of equipment is determined to be suitable for an oxidizing soot filter, a statement by the independent California Licensed Mechanical Engineer that the oxidizing soot filter has been installed and is functioning properly,

- if a piece of equipment is determined to be unsuitable for an oxidizing soot filter, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination,
- if a piece of equipment is determined to be unsuitable for an oxidizing soot filter, but suitable for an oxidation catalyst, a statement by the independent California Licensed Mechanical Engineer that the oxidation filter has been installed and is functioning properly and
- if a piece of equipment is determined to be unsuitable for both an oxidizing soot filter and an oxidizing catalyst, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination.

### **Subsequent Suitability Reports**

If a piece of construction equipment is subsequently determined to be unsuitable for an oxidizing soot filter or oxidizing catalyst after such installation has occurred, the filter or catalyst may be removed immediately. However notification must be sent to the CPM for approval containing an explanation for the change in suitability within 10 days. Changes in suitability are restricted to three explanations which must be identified in any subsequent suitability report. Changes in suitability may not be based on the use of high-pressure fuel injectors, timing retardation and/or reduced idle time.

1. The filter or catalyst is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to increased back pressure by 20% or more.
2. The filter or catalyst is causing or reasonably expected to cause significant damage to the construction equipment engine.
3. The filter or catalyst is causing or reasonably expected to cause a significant risk to nearby workers or the public.

**Verification:** The project owner will submit to the CPM for approval, the initial suitability report stamped by an independent California Licensed Mechanical Engineer, 60 days prior to breaking ground on the project site. The project owner will submit to the CPM for approval, subsequent suitability reports as required, stamped by an independent California Licensed Mechanical Engineer no later than 10 working day following a change in the suitability status of any construction equipment.

**AQ-C3** Prior to breaking ground at the project site, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the Mountainview Power Plant and related facilities.

**Protocol:** The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from construction of the project site and linear facilities. Measures that should be addressed include the following:

- the identification of the employee parking area(s) and surface of the parking area(s);
- the frequency of watering of unpaved roads and disturbed areas;
- the application of chemical dust suppressants;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site;
- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads; and,
- the use of on-site monitoring devices.

**Verification:** At least sixty (60) days prior to breaking ground at the project site, the project owner shall provide the CPM with a copy of the Construction Fugitive Dust Mitigation Plan for approval.

## REFERENCES

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- ARB (California Air Resources Board ) 1992., “Sources and Control of Nitrogen Emissions.” Sacramento, August. p. 38
- ARB 1998. “Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards”. August 1998.
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- ARB 1996. “Second Triennial Review of the Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California”. October, 1996.
- CAPCOA (California Air Pollution Control Officers’ Association) 2000. Dry-Cleaner Industry-wide Risk Assessment Committee, “Air Toxic Hot Spots Program Perchloroethylene Dry Cleaner Industry-wide Risk Assessment Guidelines” June 20, 2000.
- Chow, et al 1993. Judith C. Chow, John G. Watson and Douglas H. Lowenthal. “PM10 and PM2.5 Compositions in California’s San Joaquin Valley” Aerosol Science and Technology, the Journal of the American Association for Aerosol Research.
- EPA (US Environmental Protection Agency) 1995. Compilation of Air Emission Factors. Document AP-42.
- EPRI 1990. “Combustion Turbine NOx Control News.” Electric Power Research Institute. RP 2936, Summer 1990, Issue 3.
- MVPC (Mountainview Power Plant Project/Andrews) 2000a. Submittal letter to AFC. Submitted to the California Energy Commission on February 1, 2000.
- MVPC 2000b. Air Quality Modeling Files and Topo Maps. Submitted to the California Energy Commission on February 2, 2000.
- MVPC 2000c. Application to the South Coast AQMD for a DOC and a Permit to Construct. Submitted to the California Energy Commission on February 9, 2000.
- MVPC 2000ff. Detailed Construction Emission Calculations – Appendix G.2. Submitted to the California Energy Commission on July 21, 2000.

MVPC 2000nn. Summary status of securing the necessary emission offset credits ERC's and RECLAIM trading credits (RTCs). Submitted to the California Energy Commission on September 21, 2000.

SCAQMD (South Coast Air Quality Management District) 1999. "1997 Air Quality Management Plan"

Seinfeld, John H. "Atmospheric Chemistry and Physics of Air Pollution", Chapter 9.7, 1986.

## **CALCULATIONS OF SECONDARY PM10 IMPACTS**

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Staff proposes to use the equation below as the basis for predicting the potential secondary PM10 formation from the ammonia slip emissions at the MVPP.

$$AN = \frac{1}{2} \{TA + TN - [(TA+TN)^2 - 4(TA \cdot TN - K_p)]^{1/2}\} \quad (\text{Seinfeld 1986})$$

$$TN = N_g + N_a$$

$$TA = A_g + A_a$$

$$A_g = TA - AN$$

$$N_g = TN - AN$$

Where

- AN = Total ammonium nitrate formed
- TA = Total ammonia available to form ammonium nitrate
- TN = Total nitrate available to form ammonium nitrate
- K<sub>p</sub> = Equilibrium dissociation constant for pure ammonium nitrate
- N<sub>g</sub> = Gaseous nitric acid concentration
- N<sub>a</sub> = Aerosol nitrate
- A<sub>g</sub> = Gaseous ammonia concentration
- A<sub>a</sub> = Aerosol ammonium concentration

The components that were measured by the District in a 1995 dairy impact study that can be incorporated into these equations are the gaseous nitric acid (N<sub>g</sub>), aerosol nitrate (N<sub>a</sub>), gaseous ammonia (A<sub>g</sub>) and the aerosol ammonium (A<sub>a</sub>) concentrations. Beginning with these initial states staff would calculate the initial expected ammonium nitrate concentration (AN). Then staff would increase the A<sub>g</sub> concentration by the amount that the power plant's predicted maximum ammonia impact. By using an iterative process, staff would solve each of the above equations to eventually derive the predicted MVPP impact on ammonium nitrate formation. These results would have to be restricted to an annual average as the nitrate formation reaction is very dependent on ambient conditions. Staff intends to make these calculations available at a later date.

## **DETAILED EMISSION CALCULATIONS**

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Mountianview Power Project  
Basic Emission Factors for short term only

Equipment	Operation	lbs/hr NOx	SOx	CO	VOC	PM10
CTG Turbine	Full Load w/duct					
	102 deg F	16.37	1.31	23.92	3.19	11
	Full Load w/duct					
	82 deg F	16.64	1.33	24.32	3.24	11
	Full Load w/o duct					
	59 deg F	16.03	1.28	23.37	3.12	11
	Full Load w/o duct					
	30 deg F	16.59	1.32	24.2	3.24	11
	Full Load w/duct					
	30 deg F	17.77	1.42	25.91	3.47	11
CTG Cooling Tower	Cold start	20	0.86	50	3.47	10.38
	Warm start	20	0.86	62.5	3.47	10.38
	Hot start	20	0.86	100	3.47	10.38
	Full Load					2.92
	Startup					2.92
	Full Load					0.2
	Startup					0.02
Boiler	Full Load	32.64	0.68	2.04	0.68	0.2
	Startup	2.51	0.05	0.16	0.05	0.02
Boiler Cooling Tower	Full Load					0.77
	Startup					0.06
Emergency IC Engine	Full Load	19.8	0.44	1.56	1.56	0.81
Firewater Pump	Full Load	1.98	0.063	0.53	0.31	0.1

Basic Emission Factors for long term only

	Temperature	Duct	lb/hr NOx (see 1)	SOx	CO (see 2)	VOC	PM10
CTG Turbine @ full load	102	on	6.56	1.31	7.98	3.19	11
	82	on	6.66	1.33	8.11	3.24	11
	59	off	6.38	1.28	7.8	3.12	11
	59	on		1.37	8.34	3.34	11
	30	off	6.62	1.32	8.06	3.24	11
	30	on	7.13	1.42	8.65	3.47	11

Note: Boiler and Cooling tower emissions are the same as shortterm

1 NOx emissions assume an annual average of 1.0 ppm

2 CO emissions assume an annual average of 2.0 ppm

Mountainview Power Project - Startup Calculations

		<b>Blackstart</b>	Duration	pounds NOx	SOx	CO	VOC	PM10
No Duct	Full Load	IC Eng.	3	59.40	1.32	4.68	4.68	2.43
	Start	Boiler 1	3	7.53	0.15	0.48	0.15	0.06
		Boiler 2	3	7.53	0.15	0.48	0.15	0.06
		Boiler CT 1	3	0.00	0.00	0.00	0.00	0.18
		Boiler CT 2	3	0.00	0.00	0.00	0.00	0.18
	Full Load	Boiler 1	6	195.84	4.08	12.24	4.08	1.20
		Boiler 2	6	195.84	4.08	12.24	4.08	1.20
		Boiler CT 1	6	0.00	0.00	0.00	0.00	4.62
		Boiler CT 2	6	0.00	0.00	0.00	0.00	4.62
	Start	CTG U1 T1	3	60.00	2.58	150.00	10.41	31.14
		CTG U1 T2	3	60.00	2.58	150.00	10.41	31.14
	Full Load	CTG U1 T1	3	49.77	3.96	72.60	9.72	33.00
		CTG U1 T2	3	49.77	3.96	72.60	9.72	33.00
	Start	CTG U2 T1	3	60.00	2.58	150.00	10.41	31.14
		CTG U2 T2	3	60.00	2.58	150.00	10.41	31.14
	Full Load &	CTG CT1	6	0.00	0.00	0.00	0.00	17.52
	Start	CTG CT2	3	0.00	0.00	0.00	0.00	8.76
		<b>TOTAL</b>	<b>9</b>	<b>805.68</b>	<b>28.02</b>	<b>775.32</b>	<b>74.22</b>	<b>231.39</b>
		Ave. lb/hr		89.52	3.11	86.15	8.25	25.71
		<b>Cold Start</b>						
No Duct	Full Load	Boiler 1	6	195.84	4.08	12.24	4.08	1.20
		Boiler 2	6	195.84	4.08	12.24	4.08	1.20
		Boiler CT 1	6	0.00	0.00	0.00	0.00	4.62
		Boiler CT 2	6	0.00	0.00	0.00	0.00	4.62
	Start	CTG U1 T1	3	60.00	2.58	150.00	10.41	31.14
		CTG U1 T2	3	60.00	2.58	150.00	10.41	31.14
	Full Load	CTG U1 T1	3	49.77	3.96	72.60	9.72	33.00
		CTG U1 T2	3	49.77	3.96	72.60	9.72	33.00
	Start	CTG U2 T1	3	60.00	2.58	150.00	10.41	31.14
		CTG U2 T2	3	60.00	2.58	150.00	10.41	31.14
	Full Load &	CTG CT1	6	0.00	0.00	0.00	0.00	17.52
	Start	CTG CT2	3	0.00	0.00	0.00	0.00	8.76
		<b>TOTAL</b>	<b>6</b>	<b>731.22</b>	<b>26.40</b>	<b>769.68</b>	<b>69.24</b>	<b>228.48</b>
		Ave. lb/hr		121.87	4.40	128.28	11.54	38.08

		Warm Start							
No Duct	Full Load	Boiler 1	4	130.56	2.72	8.16	2.72	0.80	
		Boiler 2	4	130.56	2.72	8.16	2.72	0.80	
		Boiler CT 1	4	0.00	0.00	0.00	0.00	3.08	
		Boiler CT 2	4	0.00	0.00	0.00	0.00	3.08	
	Start	CTG U1 T1	2	40.00	1.72	125.00	6.94	20.76	
		CTG U1 T2	2	40.00	1.72	125.00	6.94	20.76	
	Full Load	CTG U1 T1	2	33.18	2.64	48.40	6.48	22.00	
		CTG U1 T2	2	33.18	2.64	48.40	6.48	22.00	
	Start	CTG U2 T1	2	40.00	1.72	125.00	6.94	20.76	
		CTG U2 T2	2	40.00	1.72	125.00	6.94	20.76	
	Full Load &	CTG CT1	4	0.00	0.00	0.00	0.00	11.68	
	Start	CTG CT2	2	0.00	0.00	0.00	0.00	5.84	
			<b>TOTAL</b>	<b>4</b>	<b>487.48</b>	<b>17.60</b>	<b>613.12</b>	<b>46.16</b>	<b>152.32</b>
			Ave. lb/hr		81.25	2.93	102.19	7.69	25.39
		Hot Start							
No Duct	Full Load	Boiler 1	2	65.28	1.36	4.08	1.36	0.40	
		Boiler 2	2	65.28	1.36	4.08	1.36	0.40	
		Boiler CT 1	2	0.00	0.00	0.00	0.00	1.54	
		Boiler CT 2	2	0.00	0.00	0.00	0.00	1.54	
	Start	CTG U1 T1	1	20.00	0.86	100.00	3.47	10.38	
		CTG U1 T2	1	20.00	0.86	100.00	3.47	10.38	
	Full Load	CTG U1 T1	1	16.59	1.32	24.20	3.24	11.00	
		CTG U1 T2	1	16.59	1.32	24.20	3.24	11.00	
	Start	CTG U2 T1	1	20.00	0.86	100.00	3.47	10.38	
		CTG U2 T2	1	20.00	0.86	100.00	3.47	10.38	
	Full Load &	CTG CT1	2	0.00	0.00	0.00	0.00	5.84	
	Start	CTG CT2	1	0.00	0.00	0.00	0.00	2.92	
			<b>TOTAL</b>	<b>2</b>	<b>243.74</b>	<b>8.80</b>	<b>456.56</b>	<b>23.08</b>	<b>76.16</b>
			Ave. lb/hr		121.87	4.40	228.28	11.54	38.08

### Max Hourly Emissions

Second Turbine Cold Start			Pounds				
		Duration	NOx	SOx	CO	VOC	PM10
Full Load	Boiler 1	1	32.64	0.68	2.04	0.68	0.20
	Boiler 2	1	32.64	0.68	2.04	0.68	0.20
	Boiler CT 1	1	0.00	0.00	0.00	0.00	0.77
	Boiler CT 2	1	0.00	0.00	0.00	0.00	0.77
Full Load	CTG U1 T1	1	17.77	1.42	25.91	3.47	11.00
	CTG U1 T2	1	17.77	1.42	25.91	3.47	11.00
Start	CTG U2 T1	1	20.00	0.86	50.00	3.47	10.38
	CTG U2 T2	1	20.00	0.86	50.00	3.47	10.38
	CTG CT1	1	0.00	0.00	0.00	0.00	2.92
	CTG CT2	1	0.00	0.00	0.00	0.00	2.92
	<b>TOTAL</b>	<b>1</b>	<b>140.82</b>	<b>5.92</b>	<b>155.90</b>	<b>15.24</b>	<b>50.54</b>
	turbines only		75.54	4.56	151.82	13.88	48.60

### Max Daily Emissions

Cold Start Day			Pounds				
Full Load	Boiler 1	24	783.36	16.32	48.96	16.32	4.80
	Boiler 2	24	783.36	16.32	48.96	16.32	4.80
	Boiler CT 1	24	0.00	0.00	0.00	0.00	18.48
	Boiler CT 2	24	0.00	0.00	0.00	0.00	18.48
Start	CTG U1 T1	3	60.00	2.58	150.00	10.41	31.14
	CTG U1 T2	3	60.00	2.58	150.00	10.41	31.14
Full Load	CTG U1 T1	21	373.17	29.82	544.11	72.87	231.00
	CTG U1 T2	21	373.17	29.82	544.11	72.87	231.00
Start	CTG U2 T1	3	60.00	2.58	150.00	10.41	31.14
	CTG U2 T2	3	60.00	2.58	150.00	10.41	31.14
Full Load	CTG U2 T1	18	319.86	25.56	466.38	62.46	198.00
	CTG U2 T2	18	319.86	25.56	466.38	62.46	198.00
	CTG CT1	24	0.00	0.00	0.00	0.00	70.08
	CTG CT2	21	0.00	0.00	0.00	0.00	61.32
	IC Engine	1	19.80	0.44	1.56	1.56	0.81
	<b>TOTAL</b>	<b>24</b>	<b>3,212.58</b>	<b>154.16</b>	<b>2,720.46</b>	<b>346.50</b>	<b>1,161.33</b>
			1,645.86	121.52	2,622.54	313.86	1,114.77

Maximum	Annual Emissions				Tons					
	Equipment	Operation	Temperature	Duct	Duration	NOx	SOx	CO	VOC	PM10
Turbine	Startup	Hot	off	233	2.33	0.10	11.65	0.40	1.21	
		Warm	off	96	0.96	0.04	3.00	0.17	0.50	
		Cold	off	36	0.36	0.02	0.90	0.06	0.19	
		Full Load	102	on	20	0.07	0.01	0.08	0.03	0.11
			82	on	850	2.83	0.57	3.45	1.38	4.68
			59	off	3605	11.50	2.31	14.06	5.62	19.83
			30	off	2875	9.52	1.90	11.59	4.66	15.81
		30	on	1045	3.73	0.74	4.52	1.81	5.75	
		Subtotal				8760	31.29	5.68	49.24	14.14
	CTG Cooling Tower	Startup			365					0.53
		Full Load			8395					12.26
	Subtotal				8760	0.00	0.00	0.00	0.00	12.79
	Boiler Unit 1	Startup			1495	1.88	0.04	0.12	0.04	0.01
Full Load				2500	40.80	0.85	2.55	0.85	0.25	
Subtotal				3995	42.68	0.89	2.67	0.89	0.26	
Boiler Cool Tw. 1	Startup			1495					0.04	
	Full Load			2500					0.96	
Subtotal				3995	0.00	0.00	0.00	0.00	1.01	
Boiler Unit 2	Startup			819	1.03	0.02	0.07	0.02	0.01	
	Full Load			1200	19.58	0.41	1.22	0.41	0.12	
Subtotal				2019	20.61	0.43	1.29	0.43	0.13	
Boiler Cool Tw. 2	Startup			819					0.02	
	Full Load			1200					0.46	
Subtotal				2019	0.00	0.00	0.00	0.00	0.49	
Emergency IC Engine	Full Load			200	1.98	0.04	0.16	0.16	0.08	
Firewater Pump	Full Load			200	0.20	0.01	0.05	0.03	0.01	

#### Summary Table

Equipment	Number	Tons/year				
		NOx	SOx	CO	VOC	PM10
Turbines Unit 1-4	4	125.15	22.73	196.97	56.55	192.27
Boiler Unit 1	1	42.68	0.89	2.67	0.89	0.26
Boiler Unit 2	1	20.61	0.43	1.29	0.43	0.13
Cooling Towers	4	0.00	0.00	0.00	0.00	27.07
Emergency Engine	1	1.98	0.04	0.16	0.16	0.08
Firewater Pump	1	0.20	0.01	0.05	0.03	0.01
<b>Total</b>		<b>190.62</b>	<b>24.09</b>	<b>201.14</b>	<b>58.05</b>	<b>219.82</b>
		1 ppm		2 ppm		



# PUBLIC HEALTH

Obed Odoemelum, Ph.D.

## INTRODUCTION

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Operating the proposed Mountainview Power Plant Project (MVPP) would create combustion products and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this public health analysis is to determine whether a significant health risk would result from public exposure to these chemicals and combustion by-products as routinely emitted during project operations. The issue of possible worker exposure is addressed in the **Worker Safety and Fire Protection** section of this Staff Assessment (SA). Exposure to electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as noncriteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants. Since, as noted in the **Air Quality** section, this project is proposed for an area with existing violations of specific air quality standards, the potential for impact exacerbation is addressed in this **Public Health** section in assessing the need for specific mitigation.

The criteria pollutants are also identified in this section (along with regulations for their control) because of their usually significant contribution to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies is discussed in the **Air Quality** section.

## LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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### FEDERAL

The Clean Air Act of 1970 (42 U.S.C., § 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 micron or less (PM10) and lead).

### STATE

California Health and Safety Code § 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10,

lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the noncriteria pollutants. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

California Health and Safety Code § 41700 states 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 considerable 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 business or property.”

The California Health and Safety Code §§ 39650 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, noncriteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB’s April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal-EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For noncancer-causing toxic air pollutants, Cal-EPA established specific no-effects levels (known as reference exposure levels, or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk assessments.

California Health and Safety Code § 44300 et seq. requires facilities, which emit large quantities of criteria pollutants and any amount of noncriteria pollutants to provide the local air district an inventory of toxic emissions. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB and the South Coast Air Quality Management District (SCAQMD) will ensure implementation of these requirements for the proposed project.

## **LOCAL**

The South Coast Air Quality Management District has no specific rules implementing Health and Safety Code § 44300. It does, however, require the results of a health risk assessment as part of the application for the Determination of Compliance. MVPP has complied with this requirement.

## **SETTING**

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According to information from the applicant, the Mountainview Power Company (MVPC 2000a, pages 6.3-1 through 6.3-23, 6.8-1 and 6.9-1), the project site is in a mix-use area of agricultural, industrial, and commercial uses with relatively few residences. The nearest of these residences are between 50 feet and 100 feet from

the southwest boundary of the property line. However, the nearest residential areas are west and south of the site, the closest being about 200 feet from the site. Other residences are located approximately 1,000 feet to the east and 0.25 miles to the south.

**Verification:** The applicant has identified a number of sensitive receptor locations within 1 mile of the project site. These sensitive receptor locations include schools, churches, museums, and recreational centers where children and the elderly may be found in relatively large numbers. These sensitive subgroups are classified as such because they are more susceptible than the general population to the effects of environmental pollutants in general. Therefore, extra consideration is given to possible effects in these individuals in establishing exposure limits.

As discussed by the applicant (MVPC 2000a, pages 6.8-10 through 6.8-24), the project area is non-attainment (meaning that its ambient levels are currently higher than applicable air quality standards) for ozone and PM10 at the state and federal levels mainly because of pollutant transportation from the other parts of the air basin. Such non-attainment status requires the offsetting of these two pollutants as contributed by the project and any other new sources in the air basin.

Ozone is formed secondarily from the sunlight-driven interaction of its precursor pollutants (NO<sub>x</sub> and VOCs) transported from one point to the other. Since such transportation occurs throughout a given air basin, any ozone problem is considered a basin-wide problem for which a basin-wide control strategy is formulated by the local Air District with respect to sources of the precursor pollutants. This strategy consists of (a) emission control requirements with respect to each project's emissions and (b) offset requirements with respect to the basin-wide precursor transport.

PM10 also constitutes a basin-wide problem as derived from fugitive dust, the interaction of its precursors (which include NO<sub>x</sub> and VOCs), or emitted directly from sources throughout the air basin. Its emission from each given source could create a localized health problem when project-related exposures are added to the existing basin-wide, background levels. The potential for localized impacts is minimized through specific emission controls while its potential contribution on a basin-wide basis is minimized through specific offset requirements.

## **METHOD OF ANALYSIS**

Any significant pollution-related impacts from this type of project would be mainly associated emissions from its natural gas-fired combustion turbines. Staff's main concern about cooling tower emissions is potential exposure to toxic water additives, which are not proposed for the project. Potential public exposure in the surrounding area is estimated for the combustion products through air dispersion modeling. It is these exposure estimates, along with data characterizing the existing exposure conditions, that staff uses to establish whether total exposures will be above or below the applicable air quality standards or reference exposure levels established against noncancer effects. For cancer-causing (or carcinogenic) effects, such assessment is made in terms of the potential for exposure at levels

whose related cancer risks are considered significant by regulatory agencies. The procedure for evaluating the potential for these cancer and noncancer health effects is known as a health risk assessment process and consists of the following steps:

- A hazard identification step in which each pollutant of concern is identified along with possible health effects;
- A dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- An exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling; and
- A risk characterization step in which the nature and the magnitude of the possible human health risk is assessed.

### ***HEALTH EFFECTS ASSESSED***

Health risks from a source of air pollutants can result from high-level exposure, which creates immediate-onset (acute) effects, or prolonged low-level exposure, which creates chronic effects. Noncancer effects are assumed to result after exposure above specific thresholds. Therefore, an analysis of the potential for these effects will include consideration of background or ambient levels of the toxic pollutants being assessed. Unfortunately, data on such levels is not usually available for the noncriteria pollutants associated with natural gas combustion unless there are major sources in the area. Such pollutants are generally emitted at relatively low levels as compared to the criteria pollutants, which are required to be measured and considered in assessing impacts.

For natural gas-burning facilities such as MVPP, high-level exposure to toxic pollutants (which could cause acute effects) could occur only during major accidents and is not expected from routine operations when emissions are much lower. When the area is designated as non-attainment for a criteria pollutant, incidents of acute health impacts could increase with further additions of that same pollutant from a project.

Since acute health impacts are not associated with normal noncriteria pollutant emissions, effects from chronic exposures are considered of greater concern than acute effects in assessing the potential for impacts. Such chronic effects may manifest as cancer or health effects other than cancer. Only noncancer effects are expected from chronic exposures to the criteria pollutants.

### **ASSESSING THE LIKELIHOOD OF NONCANCER EFFECTS**

The method used by regulatory agencies to assess the likelihood of acute or chronic pollutant impacts is the hazard index method. In this approach, a hazard index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source in question. This index is calculated by dividing the exposure estimate by the applicable reference

exposure level or air quality standard. After calculating the hazard indices for the individual pollutants, these indices are added together for all those that affect the same part of the body or target organ, to obtain a total hazard index. Total hazard indices of 1.0 or less are regarded as indicative of a potential lack of significant effects. However, exposures yielding a total hazard index of more than 1.0 may indicate a significant potential for the noncancer effects being considered.

In a non-attainment area, the hazard index for background exposures would be more than 1.0 for the criteria pollutant involved. For any proposed project, the hazard index for the operational phase would be obtained by dividing total (background plus project-related) exposure by the applicable air quality standard. Since all air quality standards are health-protective limits that are not to be exceeded, further additions from the project would necessitate additional mitigation with respect to the pollutant in question. The pollutant-specific hazard index that is calculated for the operational-phase exposure would facilitate the **Air Quality** staff's analysis to establish the level of mitigation necessary.

### **ASSESSING THE POTENTIAL RISK OF CANCER**

According to present understanding, cancer from carcinogenic exposure results from biological effects at the molecular level. Such effects are currently assumed possible from every exposure to a carcinogen. Therefore, staff and other regulatory agencies generally consider the likelihood of cancer as more sensitive than the likelihood of noncancer effects for assessing the environmental acceptability of a source of pollutants. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens involved. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together for the project's carcinogens to obtain the total incremental cancer risk associated with operations. Given the conservatism in the various phases of this risk calculation process, these numerical estimates are regarded as only representing the upper bounds on the cancer risk at issue. The actual risk will likely be lower and could indeed be zero. The significance of these estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

### **STAFF'S SIGNIFICANCE CRITERIA**

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. The SCAQMD considers the same risk of 10 in a million as acceptable for a source (such as MVPP) in which the best available control technology for air toxics (T-BACT) is used.

The Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is negligible (meaning that project operation is not expected to result in any increase in cancer). Above this level, further mitigation could be recommended after consideration of issues related to the limitations of the risk assessment process.

For noncarcinogenic pollutants, staff considers significant health impacts to be unlikely when the hazard index estimate is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective but would recommend specific mitigation only after consideration of issues related to the uncertainties in the assessment process.

## IMPACTS

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### PROJECT SPECIFIC IMPACTS

The health impacts from the siting and operation of the proposed project can be considered separately as construction-phase impacts and operational-phase impacts.

#### ***CONSTRUCTION PHASE IMPACTS***

Construction-phase impacts are those from human exposure to (a) the windblown dust from site grading and other construction-related activities and (b) emissions from the heavy equipment and vehicles to be used for such construction. Upon reviewing their calculation method and data (MVPC 2000a, pages 6.8-55, through 6.8-64, and Appendix G.2), staff finds that the applicant used an acceptable procedure for estimating the project's construction-related PM10 levels from fugitive dust.

A Phase I Environmental Site Assessment, which was conducted at the project site in May 1997 (MVPC 2000a, page 6.12-1 through 6.12-3), revealed specific areas of soil contamination from power generation and other industrial activities in the area. A Phase II assessment between 1997 and 1999 further delineated the site's contamination patterns while identifying the sources responsible. Remediation is scheduled to be completed before the start of MVPP construction (MVPC 2000a, page 6.12-3). Such remediation should be adequate to ensure that construction workers are not exposed to contaminated fugitive dust. The procedures for minimizing such dust generation are addressed in the **Air Quality** section while the requirements for soil remediation are specified in the **Waste Management** section. Staff considers these requirements as adequate for such purposes.

The applicant has identified the construction-phase vehicles to be used, along with their respective exhaust emission rates for the relatively short (19-month) construction period (MVPC 2000a, pages 6.8-55 through 6.8-64, and Appendix G.2). They also modeled and presented the ambient concentrations of the criteria pollutants of potential health significance in this regard (MVPC 2000a, page 6.8-63). The measures to mitigate these emissions have been specified by the applicant (MVPC 200a, page 6.8-57). Their adequacy with respect to criteria pollutants is

addressed in the **Air Quality** section. Since chronic health impacts are usually not expected from equipment emissions within the relatively short construction periods for MVPP and similar projects, only acute health effects could be significant with respect to the toxic exhaust emissions of concern in this analysis. Staff considers the applicant's specified mitigation measures as adequate with respect to these acute effects.

### ***DIRECT OPERATIONAL IMPACTS***

The applicant conducted the health risk assessment for the project-related noncriteria pollutants of potential significance, as emitted from all power generating units. This assessment was conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines for sources of this type. The results were provided to staff along with documentation of the assumptions used (MVPC 2000a, pages 6.9-6 through 6.9-11 and Appendix H). Such documentation was provided with regard to the following:

- Pollutants considered;
- Emission levels assumed for the pollutants involved;
- Dispersion modeling used to estimate potential exposure levels;
- Exposure pathways considered;
- The cancer risk estimation process;
- Hazard index calculation; and
- Characterization of project-related risk estimates.

Staff has found these assumptions to be generally acceptable for evaluating the proposed project. We concur with the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each noncarcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

### **IMPACTS ASSOCIATED WITH THE PROJECT'S NONCRITERIA POLLUTANTS.**

**Verification:** The following noncriteria pollutants were considered with respect to noncancer effects: acetaldehyde, acrolein, ammonia, barium, benzene, 1,3 butadiene, cadmium, chromium, copper, cyanide, ethylbenzene, formaldehyde, hexane, lead, manganese, mercury, naphthalene, phenols, polycyclic aromatic hydrocarbons (PAHs), propylene, propylene oxide, sulfates, toluene, xylenes, and zinc. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide.

A chronic hazard index of 0.9 was calculated for the maximally exposed individual, with and acute hazard index of 0.4 calculated for the same individual ((MVPC 2000a, 6.9-130). These indices are below the levels of potential health significance,

suggesting that no significant health impacts would likely be associated with the project's noncriteria pollutants. The highest cancer risk possible for the exposed individual was calculated as 0.17 in a million. This risk was calculated using existing procedures, which assume that the individual would be exposed at the highest possible levels to all the carcinogenic pollutants from the project for 70 years. The risk is much below staff's de minimis level as well as SCAQMD's acceptable level for sources such as MVPP.

#### **IMPACTS ASSOCIATED WITH THE PROJECT'S CRITERIA POLLUTANTS**

Only ozone and PM10 were considered among the project's criteria pollutants, because of the project area's noted designation as non-attainment for both pollutants. As presented in the **Air Quality** section, the highest area background ozone concentration as measured in 1999 is 0.13 parts per million (ppm), which, when divided by the state's 1-hour 0.09 ppm standard (which is not to be exceeded), yields a maximum background hazard index of 1.44

A maximum background PM10 level of 148 ug/m<sup>3</sup> was measured in 1995 in the project area. Dividing this by the state's 24-hr standard of 50.1 ug/m<sup>3</sup> would yield a hazard index of 2.95, pointing to a background health hazard. The emission controls and offset requirements to mitigate MVPP's additions are specified in conditions of certification recommended in the **Air Quality** section.

#### **CUMULATIVE IMPACTS**

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant levels normally fall within ambient background levels beyond the points of maximum impacts. Therefore, potentially significant cumulative impacts are only expected in situations where new sources are located adjacent to one another. Since no significant sources of noncriteria pollutants are presently located or proposed for the MVPP's impact areas (MVPC 2000a, page 6.9-16), no exposures of a cumulative nature are expected during the operational phase.

### **CONCLUSIONS AND RECOMMENDATIONS**

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#### **CONCLUSIONS**

Staff has determined that the construction and operation of the proposed natural gas-burning project will not pose a significant public health risk to the surrounding population with regard to the toxic pollutants considered. However, ozone and PM10 levels are encountered at background levels posing a significant hazard to human health. The mitigation measures recommended in the **Air Quality** section are acceptable to staff and are in keeping with the Air District's plans for an orderly, basin-wide reduction of these health hazards.

## RECOMMENDATIONS

Since ozone and PM10 are encountered in the project area at potentially hazardous levels, staff recommends adoption of the ozone- and PM10-specific mitigation measures and conditions of certification recommended in the **Air Quality** section. No significant public health impacts are considered likely by staff with regard to toxic emissions from the project's new and refurbished power generating units. Therefore, no Public Health Conditions of Certification are proposed with respect to these pollutants.

## REFERENCES

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California Air Resources Board (ARB) 1996. California Toxic Emissions Factors (CATEF) Database for Natural Gas-Fired Combustion Turbine Cogeneration.

California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.

MVPC (Mountainview Power Company) 2000a. Application for Certification: Mountainview Power Plant. Volumes I and II. Submitted to the California Energy Commission on February 1, 2000.

# WORKER SAFETY AND FIRE PROTECTION

Rick Tyler

The requirements for worker and fire protection are set forth in laws, ordinances, regulations, and standards (LORS), and enforced through Federal, State, and local regulations. Effective implementation of worker safety programs at a facility is essential to the protection of workers from workplace hazards. These programs are documented through project specific, worker safety plans. Industrial workers at the proposed facility will operate, process equipment, and handle hazardous materials, and may face other workplace hazards that can result in accidents, serious injury. The worker safety and fire protection measures proposed for this project are designed to either eliminate or minimize such hazards through special training, use of protective equipment or implementation of procedural controls

The purpose of this analysis is to assess the adequacy of worker safety and fire protection measures proposed by Mountianview Power Company (MVPC) for the Mountianview Power Project (MVPP). Staff has reviewed both the original Application for Certification (AFC) (MVPC 2000 a) and the Data Adequacy Responses (MVPC, 2000 g) to determine if the proposed MVPC has proposed adequate measures to:

- comply with applicable safety laws, ordinances, regulations and standards;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- ensure that adequate emergency response measures are implemented.

Staff has determined that the worker safety and fire protection measures associated with the proposed project will comply with applicable LORS and minimize the exposure of workers to industrial accidents and hazards. Staff has also determined the proposed project will not cause significant impacts on local fire protection services.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

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### **FEDERAL**

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970 (the Act). The Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). This public law is codified at Title 29 of the Code of Federal Regulations, under General Industry Standards, Parts 1910.1 through 1910.1450 (29 CFR Part 1910.1 - 1910.1450) and clearly defines the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the safety and health standards now in force under the Act for general industry represent a compilation of materials authorized by the Act from existing

federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI), and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The congressional purpose of the Act is to “assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources,” (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the Act.

- Applicable Federal requirements include:
- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970)
- 29 CFR Part 1910.1-1910.1450 (Occupational Safety and Health Administration Safety and Health Regulations)
- 29 CFR Part 1952.170-1952.175

(Federal approval of California’s plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR Part 1910.1-1910.1500)

## **STATE**

California passed the Occupational Safety and Health Act of 1973 (Cal/OSHA) as published in the California Labor Code § 6300 et seq. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with Part 450 (8 CCR Part 450 et seq.) The California Labor Code requires that the State Standards Board must adopt standards at least as effective as the federal standards, which have been, promulgated (Labor Code §142.3(a)). Health and Safety laws meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations in lieu of the federal requirements published at 29 CFR Parts 1910.1 - 1910.1500). The Federal Secretary of Labor, however, continually oversees California’s program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with the responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible to insure that their employees are informed about workplace hazards, potential exposure and the work environment (Labor Code §

6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Material Safety Data Sheet (MSDS) (8 CCR § 5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1990 (1980 § 874 and Labor Code §§ 6360-6399.7). It mirrored the Federal Hazard Communication Standard (29 CFR Part 1910.1200) which established an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers.

Finally, California Senate Bill 198 requires that employers establish and maintain a written Injury and Illness Prevention Program to identify workplace hazards and communicate them to its employees through a formal employee-training program (8 CCR § 3203).

- Applicable State requirements include:
- 8 CCR § 339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act
- 8 CCR § 450, et seq. Cal/OSHA regulations
- 24 CCR § 3, et seq. - incorporates the current addition of the Uniform Building Code
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility
- Health and Safety Code § 255000 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility

## **LOCAL**

The California Building Standards Code published at Title 24 of the California Code of Regulations, (24 CCR § 3, et seq.) is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, MVPC mechanical, energy, and fire codes applicable to the project. Local planning /building & safety departments enforce the California Uniform Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code is published at Part 9 of Title 24 of the California Code of Regulations.

Similarly the Uniform Fire Code Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition.

Applicable local requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9)
- Uniform Fire Code Standards
- California Building Code Title 24, California Code of Regulations Part 3, et seq.

## **SETTING**

The proposed MVPP involves the construction and operation of a natural gas natural pipeline and gas-fueled power plant in San Bernardino County. Construction of the proposed project will require a maximum workforce of 563. Operation of the project will require a workforce of 33.

The project would rely on both the Redlands and San Bernardino Fire Department in the event of a major fire or hazardous materials incident. The closest fire station to the project site is Station 263. The response time to the MVPP facility from this station is about 12 minutes. The nearest Hazmat response team is located in San Bernardino County located at 385 North Arrowhead Road. The response time from this facility to the project site is about 30 minutes.

## **IMPACTS**

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### **PROJECT SPECIFIC IMPACTS**

#### ***FIRE PROTECTION***

Staff reviewed the information provided in the AFC regarding on-site fire protection and determined that the proposed equipment and practices are adequate. In addition staff Condition of Certification WORKER SAFETY 1 requires MVPC to submit its Fire Protection Plan to the City of Redlands Fire Department for review and Comment. The Redlands Fire Department will also inspect the facility and approve the fire suppression systems prior to operation and periodically thereafter. The MVPC will rely on both on-site fire protection systems and the Fire Department's fire protection and emergency response services.

The information provided in the AFC indicates that the proposed fire protection system at the site will be adequate for fighting incipient fires. The proposed fire protection system at the site will include fire alarms, detection systems, fire hydrants, water storage, and both primary electric and backup diesel water pumps and hose stations throughout the facility. Fixed fire suppression systems will be installed at pre-determined fire risk areas, such as the transformers, turbine lubrication oil equipment, and cooling tower (MVPC 2000a). The system will be designed and operated in accordance with National Fire Protection Association (NFPA) standards and recommendations. Sprinkler systems will be installed in the Control/Administration Building and Fire Pump Building, as required by NFPA

requirements. Hand-held fire extinguishers will be located in accordance with NFPA 10 throughout the facility.

The applicant will also be required to provide final diagrams and plans of fire protection systems to staff and to the Redlands Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection systems and plans. All Fire Department access roads, water mains, and fire hydrants shall be installed and operational during construction in accordance with Article 87 of the Fire Code. A final inspection by the Fire Department will be required to confirm that the facility meets all the Fire and Building Code requirements. Staff believes that these measures are sufficient to ensure adequate protection of workers and the public from impacts associated with fire hazards posed by the proposed facility.

## **WORKER SAFETY**

Industrial environments are potentially dangerous. Workers could be exposed to chemical spills, hazardous waste, fires, moving equipment, and confined space entry and egress problems. It is important to have well-defined facility specific policies and procedures, training, and hazard recognition and control to minimize work place hazards and to protect workers from unavoidable hazards. Staff has reviewed MVPC's proposed mitigation measures for protection of workers during construction and operation of the proposed project. These mitigation measures are described below. It is staff's belief that these measures are adequate to protect workers from work place hazards associated with the proposed project and that they will comply with applicable LORS.

## **MITIGATION**

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### **MITIGATION OF DIRECT IMPACTS**

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

### **CONSTRUCTION SAFETY AND HEALTH PROGRAM**

The MVPP project includes construction and operation of two natural gas-fired combustion turbine generators equipped with evaporative combustion air coolers, two heat recovery steam generators equipped with duct burners, a condensing steam turbine generator, a mechanical draft cooling tower, electrical and natural gas infrastructure, and water treatment facilities. Therefore, during the construction phase of the project, workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at Title 8 of the California Code of Regulations beginning with section 1502 (8 CCR § 1502, et seq.). These

requirements are promulgated by Cal/OSHA and are applicable to the construction phase of the project. The Construction Safety and Health Program will include the following:

Construction Injury and Illness Prevention Program (8 CCR § 1509)  
Construction Fire Protection and Prevention Plan (8 CCR § 1920)  
Personal Protective Equipment Program (8 CCR § 1514-1522)

Additional programs under General Industry Safety Orders (8 CCR § 3200-6184), Electrical Safety Orders (8 CCR § 2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR § 450-544) include:

- Electrical Safety Program
- Unfired Pressure Vessel Safety Orders
- Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Prevention Program
- Scaffolding/Ladder Safety Program
- Articulating Boom Platforms Program
- Crane and Material Handling Program
- Housekeeping and Material Handling and Storage Program
- Hot Work Safety Program
- Respiratory Protection Program
- Employee Exposure Monitoring Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program
- Air Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

The AFC includes adequate outlines of each of the above programs. Prior to construction of the MVPP, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-1**.

## **OPERATION SAFETY AND HEALTH PROGRAM**

Upon completion of construction and prior to operations at MVPP, the Operations Safety and Health Program will be prepared pursuant to regulatory requirements of Title 8 of the California Code of Regulations. MVPC's Operation Safety and Health Program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203)
- Emergency Action Program/Plan (8 CCR § 3220);
- Fire Protection and Prevention Program (8 CCR § 3221); and;

- Personal Protective Equipment Program (8 CCR § 3401-3411);

Additional programs under General Industry Safety Orders (8 CCR § 3200-6184), Electrical Safety Orders (8 CCR §2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR § 450-544) include:

- Motor Vehicle and Heavy Equipment Safety Program;
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Crane and Material Handling Program
- Hazard Communication Program
- Hot Work Safety Program
- Respiratory Protection Program
- Electrical Safety Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Housekeeping and Material Handling and Storage Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Safe Driving Program
- Employee Exposure Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

The AFC includes adequate outlines of each of the above programs. Prior to operation of the proposed MVPP, detailed programs and plans will be provided pursuant to the condition of certification WORKER SAFETY-2.

## **SAFETY AND HEALTH PROGRAM ELEMENTS**

MVPC has provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:  
Injury and Illness Prevention Program (IIPP)

MVPC will submit an expanded Construction and Operations Illness and Injury Prevention Programs to Cal/OSHA for review and comment 30 days prior to both construction and operation of the project. The IIPP will include the following components:

- Responsible personnel
- Safety and health policy
- Work rules and safe work practices
- System for ensuring that employee compliance with safe work practices
- Employee communications

- Identification and evaluation of workplace hazards
- Methods and/or procedures for correcting unsafe or unhealthy conditions, practices, or procedures in a timely manner based upon severity of the hazards
- Specific safety procedures (included in Operations Safety and Health Program)
- Training and instruction

Cal/OSHA will review and provide comments on MVPC's IIPP as a result of an consultation request required by staff's Condition of WORKER SAFETY 1. A Cal/OSHA representative will complete a physical survey of the site, analyze work practices, and assess those practices that may likely result in illness or injury. This on-site consultation will give Cal/OSHA an opportunity to evaluate MVPC's IIPP in conjunction with the activities occurring on site.

### ***EMERGENCY ACTION PLAN***

- California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan. The outline lists the following features:
- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
- Procedures to account for all employees after emergency evacuation has been completed
- Rescue and medical duties for employees
- Fire and emergency reporting procedures
- Alarm and communication system
- Contact personnel
- Response procedures for ammonia release
- Training requirements

Staff proposed a condition of certification WORKER SAFETY-2, which requires MVPC to submit a final Operation's Emergency Action Plan to Cal/OSHA for review and comment after an on-site consultation. It also requires that MVPC submit the final Operation's Emergency Action Plan to the Fire Department for review and approval.

### **FIRE PREVENTION PLAN**

California Code of Regulations requires Construction and Operation Fire Prevention Plans (8 CCR § 1920 and 3221). The MVPP AFC contains an outline of the proposed fire prevention plans. Development and implementation of Construction and Operations Fire Prevention Plans, required by staff's recommended conditions of certification WORKER SAFETY-1 and 2, will include the following:

- General requirements
- Fire hazard inventory, including ignition sources and mitigation
- Housekeeping and proper materials storage
- Employee alarm/communication system
- Portable fire extinguishers

- Fixed freighting equipment
- Fire control
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of liquids
- Training
- Contact personnel
- Local fire protection services

The conditions of certification also require MVPC to submit a copy of the Construction and Operations Fire Prevention Plans to the California Energy Commission compliance Project Manager (CPM) and Fire District for review and approval.

### **PERSONAL PROTECTIVE EQUIPMENT PROGRAM**

California regulations require that Personal Protective Equipment (PPE) and first aid supplies be provided whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function, from absorption, inhalation or physical contact (8 CCR § 3380-3400). MVPP's operational environment will require development and implementation of a PPE.

The PPE Program ensures that employers provide appropriate protective equipment, ensure proper use of such equipment, and provide employees with the information and training necessary to implement the program. MVPC provided a satisfactory outline that identifies minimum requirements of a proposed PPE program. The components of MVPC's program will include:

- Hazard analysis and prescription of PPE
- Personal protective devices
- Head protection
- Eye and face protection
- Body protection
- Hand protection
- Foot protection
- Skin protection
- Sanitation
- Safety belts and lifelines for fall protection
- Protection for electric shock
- Medical services and first aid/ bloodborne pathogens
- Respiratory protective equipment
- Hearing protection
- Training

### **GENERAL SAFETY**

In addition to the specific plans listed above, there are additional general requirements applicable to the project, called "safe work practices". Both the

Construction and the Operations Safety Programs will include elements addressing safe work practices. The components of these programs are presented below.

#### **MOTOR VEHICLE AND HEAVY EQUIPMENT SAFETY PROGRAM**

This program ensures the safe operation and maintenance of vehicles and heavy equipment. A safe driving training program will be included in the operations safety program.

#### **FORKLIFT OPERATION PROGRAM**

Forklifts will only be operated by trained and certified operators. Training programs will include procedures for safe fueling and procedures for safe forklift operation.

#### **EXCAVATION/TRENCHING PROGRAM**

A Cal/OSHA permit is required for certain trenches, excavations, structures, scaffolding and dismantling. MVPC's program will include:

- Shoring, sloping, and benching requirements
- Cal/OSHA permit requirements
- Inspection
- Air monitoring
- Access and egress

#### **FALL PROTECTION PROGRAM**

Worker training will identify fall hazards and identify the appropriate protection devices, such as safety harnesses.

#### **SCAFFOLDING / LADDER SAFETY PROGRAM**

Workers will be trained in the construction, inspection and proper use of ladders and scaffolding equipment, and the appropriate safety and protective equipment to use.

#### **ARTICULATING BOOM PLATFORMS PROGRAM**

This program will consist of:

- Inspection of equipment
- Load ratings
- Safe operating parameters
- Operator training

#### **CRANE AND MATERIAL HANDLING PROGRAM**

Only certified and licensed operators will be permitted to operate cranes. Worker training will include:

- Inspection of equipment
- Load ratings
- Safe operating parameters

## **HOT WORK SAFETY PROGRAM**

Work, which causes sparks or can ignite combustible materials, such as welding, cutting or brazing is called hot work. Before proceeding with hot work, workers will request a work authorization from the projects assigned Safety Officer. The control operator and shift supervisor will approve these requests. Before proceeding, the area will be inspected and the job posted. MVPC's proposed Hot Work Safety Program will include:

- Welding and cutting procedures
- Fire watch
- Hot work permit
- Personnel protective equipment
- Training

## **EMPLOYEE EXPOSURE MONITORING PROGRAM**

Routine medical surveillance will be conducted on workers to evaluate and monitor individual exposure to hazardous conditions or substances. This program will include:

- Exposure evaluation
- Monitoring and reporting requirements
- Medical surveillance
- Training

## **ELECTRICAL SAFETY PROGRAM**

MVPC's Electrical Safety Program will include procedures for grounding, lock-out/tag-out, overhead and underground utilities, utility clearance and employee training. Lock-out/tag-out requirements are specified under Title 8 of the California Code of Regulations (8 CCR §§ 2320.4, 2320.5, 2320.6, 2530.43, 2530.86, 3314, 3340 and 3341). These procedures reduce employee exposure to moving equipment, electrical shock, and hazardous and toxic materials exposure. Lock-out is the placement of a padlock, blank flange, or similar device on equipment to ensure it will not be operated until the lock-out device is removed. Tag-out procedures utilize warning signs that caution personnel when equipment can not be energized until the lock-out device is removed. Warning signs are used to alert employees to the presence of hazardous and toxic materials. MVPC's lock-out/tag-out program will include steps for applying and removing locks and tags, and employee training procedures.

## **CONFINED SPACE ENTRY**

The California Code of Regulations identifies the minimum standards for preventing employee exposure to contaminated and/or oxygen deficient spaces. Confined spaces include areas where there is an oxygen-deficient atmosphere, a limited means of egress, or areas with a source of toxic or flammable contaminants (8 CCR Sections 5156-5168). Confined spaces can include silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. MVPC

included an outline of their confined space entry program, that includes the following components:

- Air monitoring and ventilation requirements
- Rescue procedures
- Lock-out / tag-out and blocking, blinding, and blanking requirements
- Permit completion
- Training

Before entering a confined space, personnel will evacuate or purge the space and disconnect the lines that provide access of substances into the space. The air in the vessel will be tested for oxygen deficiency, and the presence of toxic and explosive gases and vapors. Employees will wear lifelines or safety harnesses when entering the confined space, and a person will be stationed outside the confined space to handle the line and summon assistance in case of emergency. Appropriate respirators will be provided when necessary.

#### **HAND AND PORTABLE POWER TOOL SAFETY PROGRAM**

This program applies to construction and operations. It will include guarding and proper operations of power tools and worker training in proper use of such tools.

#### **HOUSEKEEPING AND MATERIAL HANDLING AND STORAGE PROGRAM**

This program will ensure safe handling of equipment, and general housekeeping practices. Worker training includes good housekeeping practices.

#### **HEARING CONSERVATION PROGRAM**

This program will result in identification of high-noise environments and prescribe appropriate hearing protective devices to areas based on the noise level. Although hearing protection is included in personal protective equipment, this program includes exposure monitoring and medical surveillance, and worker training.

#### **BACK INJURY PREVENTION PROGRAM**

This program will provide training in proper lifting practices and material handling procedures.

#### **HAZARD COMMUNICATION PROGRAM**

The Hazard Communications Standard establishes an employee's right to know about chemical hazards in the workplace. In accordance with federal and State requirements, MVPC will prepare a list of hazardous substances and provide a Material Safety Data Sheet (MSDS) for each substance on the list found in the workplace. MVPC will train workers to understand MSDS and to work safely with hazardous substances. Worker training in this program will also include proper labeling, storage and handling of hazardous materials.

#### **RESPIRATORY PROTECTION PROGRAM**

The respiratory protection program will include:

- Proper selection and use of a respirator
- Fit testing
- Medical requirements
- Inspection, repair, cleaning and storage of respirator
- Training

#### **HEAT AND COLD STRESS MONITORING AND CONTROL PROGRAM**

This program will include monitoring, prevention and control methods to ensure that workers are protected from hazards associated with extreme hot or cold environments.

#### **PRESSURE VESSEL AND PIPELINE SAFETY PROGRAM**

Employees conducting work involving pressure vessels and pipelines will be trained in the following procedures:

- Line-breaking policy
- Equipment inspection and maintenance
- Blocking , bleeding, and blanking
- Communication

### **FACILITY CLOSURE**

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The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time.

## **CONCLUSION AND RECOMMENDATIONS**

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### **CONCLUSIONS**

If MVPC provides: (1) a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification WORKER SAFETY 1 and 2; staff believes that the project will incorporate sufficient measures to ensure adequate levels of worker and fire protection, and will comply with applicable LORS.

### **RECOMMENDATIONS**

If the Commission certifies the project, staff recommends adoption of the following proposed conditions of certification. The proposed conditions of certification provide assurance that Project Construction and Operation will not create significant impacts on workers or the public. The conditions also require verification that final plans are adequate to assure that worker safety and fire protection programs will comply with applicable LORS.

## PROPOSED CONDITIONS OF CERTIFICATION

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**WORKER SAFETY-1** The project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, containing the following:

- a construction Injury and Illness Prevention Program
- a construction Fire Protection and Prevention Plan
- a personal Protective Equipment Program

Protocol: The Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

The Construction Fire Protection and Prevention Plan shall be submitted to the City's of Redlands Fire Department for review and acceptance.

**Verification:** At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program, with a copy of the cover letter transmittal of the programs to Cal/OSHA Consultation Service. The project owner shall provide a letter from the City of Redlands Fire Department stating that they have reviewed and accepted the Construction Fire Protection and Prevention Plan.

**WORKER SAFETY-2** The project owner shall submit to the CPM a copy of the Project Operation Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan
- an Emergency Action Plan
- on Operation Fire Protection Plan
- a Personal Protective Equipment Program

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service for review and comment concerning compliance of the program with all applicable Safety Orders. The operation's Emergency Action Plan and Fire Protection Plan shall be submitted to the City of Redlands Fire Department for review and acceptance. The final versions of the operation Injury and Illness Prevention Plan, Emergency Action Plan, Fire Protection Plan and Personal Protective Equipment Program shall incorporate Cal/OSHA and City of Redlands Fire Department comments.

**Verification:** Verification: 2 At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program with a copy of the cover letter to Cal/OSHA's Consultation Service, and City of Redlands Fire Department comments stating that

they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

## REFERENCES

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# TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam, Ph.D.

## INTRODUCTION

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The energy generated from the new and existing units of the proposed Mountainview Power Plant Project (MVPP) will be transmitted to the existing Southern California Edison (SCE) power grid through the 230 kV SCE San Bernardino Switchyard adjacent to the east of the project site. The connection to the two new units will be made through two new 230 kV overhead lines, which will be located entirely within the project site. The existing on-site 115 kV connection from the existing generation units will be raised to 230 kV as part of the proposed power plant project. The purpose of this staff analysis is to assess the two proposed on-site connection lines for compliance with existing design requirements and (b) evaluate the impacts of the additional energy on the fields within this section of the SCE transmission system which consists of four 230 kV lines and extends from the San Bernardino Substation to the Devers, Vista, and Etiwanda Substations. The assessment will evaluate the following issues that relate primarily to the physical presence of the lines, or secondarily to the physical interactions of their electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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Discussed below by subject area are design-related LORS applicable to the physical impacts of the proposed connection lines and the existing SCE transmission system into which power from MVPP will be transmitted. The impacts of concern are addressed through specific federal or state regulations or through established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above.

## AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collision throughout the country.

## **FEDERAL**

- Title 14, Part 77 of the Federal Code of Regulations (CFR), “Objects Affecting the Navigation Space”. Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.
- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that may Affect the Navigation Space”. This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting”. This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

## **INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION**

Transmission line-related radio-frequency interference is one of the indirect effects of line operation as produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

## **FEDERAL**

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all

complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement. Since electric fields cannot penetrate the soil and other objects, underground lines do not produce the radio noise associated with overhead lines.

## **STATE**

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

## **AUDIBLE NOISE**

### **FEDERAL**

As with radio noise, any audible noise from a transmission line usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It therefore, is generally not expected at significant levels from lines of less than 345 kV such as the ones within the area's SCE transmission system and the ones proposed for MVPP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way. There are no design-specific regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance.

## **NUISANCE SHOCKS**

### **FEDERAL**

Nuisance shocks around transmission lines are non-hazardous but unpleasant experiences caused by current flow at levels generally incapable of causing significant physiological harm. Such shocks mostly result from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields. For

modern high-voltage lines, shocks of this type are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). As with the proposed and existing SCE lines, the owner is responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

## **FIRE HAZARDS**

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees and other combustible objects.

### ***STATE***

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction”. This order specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14 Section 1250 of the California Code of Regulations, “Fire Prevention Standards for Electric Utilities”. This code specifies utility-related measures for fire prevention.

## **HAZARDOUS SHOCKS**

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

### ***FEDERAL***

- National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. Provisions in this part of the code specify the national safe operating clearances applicable in areas where the line might be accessible to the public. Such requirements are intended to minimize the potential for direct or indirect contact with the energized line.

### ***STATE***

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements usually ensures the safety of the general public and line workers.

- Title 8, CCR, Group 2, Sections 2700 through 2974. “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

## **ELECTRIC AND MAGNETIC FIELD EXPOSURE**

The possibility of health effects from exposure to electric and magnetic fields has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering exposure to both as EMF exposure. The available evidence, as evaluated by CPUC and other regulatory agencies, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to reduce such fields where feasible, until the issue is better understood. The challenge has been to establish when and how far to reduce them. Several regulations have been established to control human exposure.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns relate to the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

## **FEDERAL**

No federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Minnesota, Florida, New York, Montana, and New Jersey) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. All regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, whose effects can manifest as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate building materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

## **STATE**

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires a showing that each proposed line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability, efficiency and maintainability. It is therefore, up to each applicant to ensure that such measures are applied without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends, in the case of electric fields, on line voltage, the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the reduction measures necessary.

## **SETTING**

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According to information from the applicant, the Mountainview Power Company, or MVPC (2000a, pages 2-1, 2-46, and 2-63), the MVPP site is an area with a network of SCE transmission lines of 66 kV, 115 kV, and 230 kV whose switchyards are near the site. The power from the existing units is presently transmitted into the SCE system at 115 kV through a 115 kV terminal at the San Bernardino switchyard. It is this transmission that will be increased to 230 kV after these existing units are refurbished as part of MVPP. Since there will be no project-related modifications to the existing SCE transmission system, the four 230 kV lines that presently transmit the generated energy into the SCE power grid will remain the same when all the new units are operational.

The MVPP site is in a sparsely populated area, therefore, relatively few individuals would be subjected to the prolonged residential field exposures at the root of the present health concern. According to Information from the applicant (MVPC 2000a, page 6.9-1), the nearest residences to the plant site (and therefore the on-site connecting kV lines being assessed), are the four along the west side of Mountainview Avenue, approximately 50 to 100 feet to the south. Other residences are located 1,000 feet to the east and 0.5 miles to the south. Most field exposures would be to workers on site. Since (a) line electric fields depend only on applied voltage and (b) the system's voltage will remain the same within the SCE lines to be used, there will be no change in the strengths of the electric fields within the rights-of-way of the lines from the San Bernardino Switchyard to the Devers, Atiwanda and Vista Switchyards located between 8.2 and 43.4 miles to the east and west. The added power from the proposed units would increase the system's magnetic fields along the rights-of-way since magnetic fields (unlike electric fields) vary with current flow.

## **PROJECT DESCRIPTION**

The proposed transmission project will consist of two single-circuit, 500-foot 230 kV overhead lines extending on site from each of the two generating units to SCE's 230 kV San Bernardino Switchyard. Minor modifications within the switchyard would allow the power from the existing units to be transmitted at 230kV instead of the present 115 kV. Each line conductor will be supported on steel towers and arranged in keeping with SCE's field-reducing specifications. The height at the lowest point will be 23 feet. At 500 feet, each proposed line will be much shorter than those within the existing transmission system through which the generated power will be transferred to the load centers up to 43.4 miles away, in the case of the Devers Substation.

## **IMPACTS**

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### **GENERAL IMPACTS**

As noted in the LORS section, GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to prevent the direct or indirect contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts manifesting as nuisance shocks, radio noise, communications interference and human field exposure. The relative magnitude of such impacts would be reflected in the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation, together with related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will, therefore, vary from one service area to the other according to prevailing conditions. Each project proponent will apply such measures to the extent appropriate for the geographic area involved. The potential for all these impacts is assessed separately for each proposed project.

### **PROJECT SPECIFIC IMPACTS**

#### ***AVIATION SAFETY***

There are no major airports in the immediate vicinity of the MVPP site within which the two proposed 230 kV lines will be located. Since (a) the proposed lines will be designed according to SCE guidelines relative to aviation and the other safety hazards and, (b) the existing SCE lines to which they will be connected have not posed a significant hazard to area aviation, staff does not expect these proposed lines to pose a significant hazard to area aviation. An FAA "Notice of Construction or Alteration" will not be required, according to existing regulatory criteria. However, owners of transmission lines generally inform the FAA about such lines before construction, even when the FAA notice is not required. The applicant intends to appropriately inform the FAA with respect to the proposed lines and MVPP's stacks (MVPC 2000a, page 6.3-17).

#### ***INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION***

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware and other irregularities around the conductor surface. The applicant's intended use of a low-corona conductor design, construction, and maintenance methods (MVPC 2000a, page 2-68) should minimize the potential for such interference, which is usually of concern only for lines of 345 kV and above. No significant communications interference is expected, as with the existing SCE 230 kV lines designed according to SCE guidelines relative to communication interference. The previously noted provisions of the related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the affected individual. Since the proposed

lines are to be located onsite, away from area residences, staff does not consider the communication interference issue as significant for MVPP.

### **AUDIBLE NOISE**

As with radio noise, the low-corona conductor proposed for the MVPP line and currently used in the SCE 230 kV lines (to which MVPP's energy will be transmitted), will minimize the potential for audible noise. This means, as noted by the applicant (MVPC 2000, pages 2-67 and 2-68), that the new lines will not add significantly to existing background noise levels in the project area. For an assessment of the noise from all phases of the proposed power plant and related facilities, please refer to staff's analysis in the **Noise** section.

### **FIRE HAZARDS**

Since the project-related lines will be located entirely within the project site and operated in keeping with SCE's fire prevention guidelines, staff does not expect them to pose a fire hazard during operations.

### **HAZARDOUS SHOCKS**

As with all SCE transmission lines, the proposed connection lines will be designed according to GO-95 requirements against hazardous shocks from direct or indirect human contact with the overhead energized line. Therefore, staff does not expect these lines to pose a shock hazard on site.

### **NUISANCE SHOCKS**

Since the proposed lines will be grounded according to SCE requirements, staff does not expect them to pose a significant nuisance shock at their on-site location. Ensuring GO-95-required ground clearance, as with all SCE lines, will minimize the potential for the electrical charging for which such grounding would be necessary.

### **ELECTRIC AND MAGNETIC FIELD EXPOSURE**

The proposed lines will be designed in compliance with SCE's EMF reduction requirements arising from CPUC Decision 93-11-013 of 1989. Since the applied voltage will remain the same in the new on-site lines and the existing SCE lines. The applicant calculated the maximum strengths of the existing line electric fields at 5.3 kV/m directly underneath, diminishing to 0.93 kV/m at the edge of the right-of-way, 75 feet from the center. These fields will remain the same during MVPP operations.

From data on the maximum currents in the existing lines, the applicant calculated the maximum magnetic field strengths underneath the existing lines at 44 mG, directly underneath, and 20 mG at the edge of the right-of-way. The additional power from MVPP's new units would increase these magnetic fields to 220 mG directly underneath and 100 mG at the edge of the right-of-way and the switchyard boundary (MVPC 2000a, page 2-66). The results show that the additional power generation from MVPP would significantly add to magnetic field strengths around the proposed and the existing SCE lines. These field strengths are similar to SCE lines of the same voltage and current-carrying capacity. Staff has established the appropriateness of the applicant's calculation approach with respect to parameters

bearing on field strength and dissipation, and exposure levels. These field strengths are less at the edge of the right-of-way than for fields in states with regulatory limits. It is only for the edges of rights-of way that these limits were established in these states. These regulatory limits range from 200 mG in New York to 150 mG in Florida.

## **CUMULATIVE IMPACTS**

The strengths of electric and magnetic fields from the proposed line were calculated (and will be required) to be measured to factor the interactive effects of all area lines. These calculated field strength values, therefore, reflect the cumulative exposure of an individual to fields from all lines within the impact area of the proposed lines. They reflect the implementation of the field-reducing guidelines incorporated in SCE field designs as currently required by the CPUC.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as those proposed for this project, the public health significance of any project-related field exposure cannot be characterized with certainty. The short-term exposures associated with the proposed and the other lines in its field impact area are typical of similar SCE lines. The long-term residential magnetic exposure primarily at the root of the present health concern will be insignificant in the case of the proposed MVPP since the lines will be located entirely within the project site. Any nuisance shocks from the lines will be minimized through grounding and other measures to be implemented by the project owner in compliance with GO-95, Title 8, Section 2700 et seq. of the California Code of Regulations, and SCE guidelines. Since these relatively short (500-foot) lines will be located away from all area airports, any hazard to area aviation will be small. The use of low-corona conductors together with an appropriate line maintenance program will minimize the potential for interference with radio-frequency communication.

### **RECOMMENDATIONS**

Since the proposed 230 kV transmission lines will be designed according to the applicable SCE safety and field-reducing guidelines, and routed over a relatively short (500-foot) distance within the MVPP site, staff recommends their approval for the routes proposed. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure implementation of the measures necessary to achieve the field levels assumed by the applicant for the line design.

### **CONDITIONS OF CERTIFICATION**

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**TLSN-1** The project owner shall construct the proposed transmission line according to the requirements of GO-95, GO-52, Title 8, Group 2, Sections 2700 through 2974 of the California Code of Regulations and SCE's EMF-reduction measures arising from CPUC Decision 93-11-013.

**Verification:** Thirty days before start of transmission line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the transmission line will be constructed according the requirements of GO-95, GO-50, Title 8, Group 2, Sections 2700 through 2974 of the California Code of Regulations, and SCE's EMF reduction guidelines arising from CPUC Decision 93-11-013.

**TLSN-2** The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields for the area along the proposed 500-foot lines, before and after the lines are energized. Measurements should be made at the same point for which field strength values were presented by the applicant in the AFC. The areas to be measured should include the facility switchyard.

**Verification:** The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements. These measurements shall be completed within 6 months of the start of operations.

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# HAZARDOUS MATERIALS MANAGEMENT

Testimony of Rick Tyler

## INTRODUCTION

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The purpose of this analysis is to determine if the proposed Mountainview Power Project (MVPP) will result in the potential for a significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. There are specific regulations applicable to protection of workers in general the standards for exposure and methods used to protect workers are very different than those applicable to the general public. Employers must inform employees of hazards associated with their work and workers accept a higher level of risk than the general public in exchange for compensation. Workers are thus not afforded the same level of protection normally provided to the public. Further, special protective equipment and training can be used to protect workers and reduce the potential for health impacts associated with the handling of hazardous materials (see staff's **Worker Safety and Fire Protection** analysis). Application of this type of mitigation would not be appropriate for the general public.

The only hazardous materials proposed for use at the MVPP in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), are aqueous ammonia and sulfuric acid (MVPC 2000a). The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at high pressure. The high pressure and resultant latent internal energy associated with the anhydrous form of ammonia can act as a driving force in the event of an accidental release. Loss of containment involving anhydrous ammonia typically results in violent release and can rapidly introduce large quantities of the material into the ambient air, where it can be transported by the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are typically much less violent and easier to contain. In addition, the emission rate from a release of aqueous ammonia is limited by mass transfer from the free surface of the spilled material, thus reducing the rate of emission to the atmosphere. While sulfuric acid is a listed material, its storage and use poses no risk of off-site impacts. The sulfuric acid proposed for use is a non-fuming 93% solution with very low vapor pressure. This low vapor pressure limits the emission rate from any spill to a level that precludes significant off-site concentrations.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors, water conditioners and hydrogen will be present

at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. Issues regarding the design of the natural gas pipeline are addressed in staff's **Facility Design** analysis.

The MVPP will also require the transportation of aqueous ammonia to the facility. Analysis of ammonia transportation is addressed in staff's **Traffic and Transportation** analysis.

## **LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES**

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The following federal, state, and local laws and policies generally apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

### **FEDERAL**

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C. F. R., § 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility.

### **STATE**

The requirements of the Federal Acts described above are reflected in the California Health and Safety Code section 25531 et seq. The California Health and Safety Code section 25534 directs facility owners storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP). This requirement is not applicable to the proposed TMPP project as none of the materials proposed for use are listed as acutely hazardous. The Aqueous ammonia proposed for use at the facility will be exempt because the ammonia concentration in solution is 19%.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements

primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

California 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 causes injury, detriment, nuisance, or annoyance to any considerable 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 AND REGIONAL**

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design** portion of this document.

## **SETTING**

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### **SITE AND VICINITY DESCRIPTION**

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- The local meteorology,
- Terrain characteristics, and
- The location of population centers and sensitive receptors relative to the project.

Staff considered these factors, as discussed below, in assessing the potential public health impacts of the project.

### ***METEOROLOGICAL CONDITIONS***

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the level of public exposure to such materials and the associated health risks. When wind speeds are low and stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the **air quality** section of the AFC (MVPC 2000a). This data indicates that wind speeds

below one meter per second and temperatures exceeding 80°F can occur in the project area. Therefore, staff suggests that the applicants use F stability (stagnated air, very little mixing), one meter per second wind speed and an ambient temperature of 100° F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. These conditions were reflected in the modeling used to estimate the potential worst case impacts associated with an accidental ammonia release with exception of 1.5 meters per second wind speed.

### ***TERRAIN CHARACTERISTICS***

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The principal risk of accidental release at this facility is associated with aqueous ammonia. However, modeling of an accidental release of aqueous ammonia indicates that significant concentrations would be confined to the facility property under all plausible release scenarios. Thus, elevated terrain is not an important factor affecting the modeled results for the project.

### ***LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS***

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). Also, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 6.4a-c (MVPC, 1999a) shows the locations of both populated areas and sensitive receptors in the project vicinity.

## **IMPACTS**

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Based on the hazard potential and quantities to be stored or handled, the energy commission staff has determined that aqueous ammonia and natural gas are the only hazardous materials that pose a risk of off-site impacts. The following is a project specific analysis of the potential impacts associated with the handling of each of these materials. Aqueous ammonia could be released from the storage tank directly or during delivery of ammonia from the delivery vehicle to the storage tank.

### **AQUEOUS AMMONIA**

Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NOx) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 200 ppm,

which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the exposure associated with a potential release would exceed 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

The applicant provided the results of modeling for a worst case accidental release of aqueous ammonia (MVPC 2000a). The worst-case release scenario is associated with a postulated spontaneous catastrophic storage tank failure. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and that winds of 1.5 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. This analysis indicated that concentrations exceeding 75 PPM could occur at one sensitive receptor location and that concentrations exceeding 200 PPM could occur at two nearby residences. Staff agrees with the modeling approach used and the estimates of downwind concentrations associated with the storage tank failure scenario. Staff also agrees with MVPC's conclusion that such a release is implausible with a risk below one in 1,000,000 per year.

MVPC also evaluated a more plausible scenario involving a release during transfer of ammonia from the delivery vehicle to the storage tank. Staff also agrees with the modeling approach used in this analysis. In modeling this scenario MPC reflected the effect of a catchment basin which they propose as part of the project. This basin would capture any material released during a delivery accident and direct it to a covered sump. The only exposure to the atmosphere would then be through the drain. With this mitigation concentrations above 75 PPM would not extend to any public receptors.

## **NATURAL GAS**

Natural gas, which will be used as a fuel by the project, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code 85A requires: 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in gas fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture.

The facility will also require the installation of a natural gas pipeline that could result in accidental release of natural gas. Staff believes that design and construction of the natural gas pipeline to current codes will reduce the risk of accidental release of natural gas to insignificant levels. The design and construction of the natural gas pipeline is governed by laws and regulations discussed in staff's **Facility Design** analysis. Staff believes that these measures are sufficient to reduce the risk of a natural gas release to insignificant levels.

## **CUMULATIVE IMPACTS**

As proposed, the facility will cause no significant risk of off-site impacts. Thus the direct impacts of the project will not add to any existing accidental release risks.

## **FACILITY CLOSURE**

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The requirements for handling of hazardous materials remain in effect until such materials are removed from the site. Regardless of facility closure the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility, in a manner which poses a risk to surrounding populations, staff will coordinate corrective action with the California Office of Emergency Services, Shasta County Environmental Health Department and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties (O.E.S. 1990).

## **MITIGATION**

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The worst case accidental release scenario for ammonia evaluated by the applicant assumed that all accidental spills would occur from the storage vessel into the basin below the storage vessel. While such an event could result in hazardous downwind concentrations staff agrees with MVPC's conclusion that such an event is implausible. MVPC proposes inclusion of a catchment basin between the delivery area and the storage facility. This mitigation effectively mitigates the plausible risk of an accidental release during transfer of ammonia between the delivery truck. Staff, therefore, does not propose any additional mitigation measures.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSION**

Staff's evaluation of the proposed project will pose no plausible potential for significant impacts on the public. With adoption of the proposed conditions of certification, the project will comply with all applicable laws, ordinances, regulations and standards (LORS). With adoption of staff's proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will

not pose any potential for significant impacts to the public from hazardous materials releases.

## RECOMMENDATION

Staff recommends the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental release of ammonia or any other hazardous materials.

## PROPOSED CONDITIONS OF CERTIFICATION

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**HAZ-1** The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, C. F.R. Part 355, Subpart J, section 355.50, not listed in Appendix B, below, or in greater quantities than those identified by chemical name in Appendix B, below, unless approved in advance by the CPM.

**Verification:** The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.

**HAZ-2** If required the project owner shall provide a Risk Management Plan and a Process Safety Management Plan to the San Bernardino County Fire Department and the CPM for review at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA) and the California Occupational Safety and Health Administration (Cal-OSHA). The Project owner shall also reflect all recommendations of the San Bernardino County Fire Department and the CPM in the final Plans. A copy of the final plans, reflecting all comments, shall be provided to the San Bernardino County Fire Department and the CPM once accepted by EPA and Cal-OSHA.

**Verification:** At least 60 days prior to the delivery of aqueous ammonia to the facility, the project owner shall provide final plans listed above to the CPM for review and approval.

**HAZ-3** The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 110% of the storage volume plus the volume associated with 24 hours of rain assuming a 25 year storm.

**Verification:** At least 60 days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

**HAZ-4** The project owner shall provide a covered secondary containment basin to passively contain any spill during the delivery of aqueous ammonia to the storage facility.

**Verification:** At least 60 days prior to construction of the secondary containment basin described above, the project owner shall provide detailed design drawings and specifications for the secondary containment basin to the CPM for review and approval.

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## HAZARDOUS MATERIAL MANAGEMENT

### Appendix A

#### BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

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Staff uses a criterion of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this criterion is not consistent with the 200 ppm criterion used by EPA and Cal EPA in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices are implemented and actions are taken in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limits (STPELs) to determine the potential for significant impact. These limits are designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at these levels should not result in "serious sequelae" but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures of the general public to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75 ppm STPEL.

## HAZARDOUS MATERIAL MANAGEMENT

### APPENDIX A TABLE 1

#### Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH <sup>2</sup>	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10 <sup>1</sup>	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL <sup>2</sup>	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL <sup>3</sup>	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL <sup>4</sup>	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protect nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA <sup>2</sup>	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2 <sup>5</sup>	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

\* The (NRC 1979), (WHO 1986), and Haber's Law all suggest a direct relationship to increases in effect with both increased exposure and increased exposure duration of exposure for direct non-specific irritants such as ammonia. \*\* The (NRC 1979) describes a study involving young animals which suggests greater sensitivity to acute exposure in young animals.

The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

## REFERENCES

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## ABBREVIATIONS

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ACGIH, American Conference of Governmental and Industrial Hygienists  
AIHA, American Industrial Hygienists Association  
EEGL, Emergency Exposure Guidance Level  
EPA, Environmental Protection Agency  
ERPG, Emergency Response Planning Guidelines  
IDLH, Immediately Dangerous to Life and Health Level  
NIOSH, National Institute of Occupational Safety and Health  
NRC, National Research Council  
STEL, Short Term Exposure Limit  
STPEL, Short Term Public Emergency Limit  
TLV, Threshold Limit Value  
WHO, World Health Organization

## **HAZARDOUS MATERIAL MANAGEMENT**

### **Appendix B**

[Insert here Table 6.10-1 from the AFC (MVPC 2000a)]



# WASTE MANAGEMENT

Obed Odoemelam, Ph.D.

## INTRODUCTION

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Different types of wastes will be generated during the construction and operation of the proposed Mountainview Power Plant Project (MVPP) and must be managed appropriately to minimize the potential for adverse human and environmental impacts. These wastes are designated as hazardous or non-hazardous according to the toxic nature of their respective constituents. This analysis assesses the adequacy of the management plan proposed by the applicant (the Mountainview Power Plant Company, LLC, or MVPC) with respect to handling, storage and disposal of these wastes in the amounts estimated for the project. The handling of project's wastewater, for which a National Pollutant Discharge Elimination System (NPDES) permit is required, is discussed in the **Soil and Water Resources** section.

This Energy Commission staff (staff) analysis is intended to ensure that all the wastes of concern are handled and disposed of according to the applicable laws, ordinances, regulations, and standards (LORS). These LORS are discussed below.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

#### ***RESOURCE CONSERVATION AND RECOVERY ACT, RCRA, (42 U.S.C. § 6922)***

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires the generators of hazardous wastes to comply with requirements regarding:

- Record keeping practices which identify the quantities and disposal of hazardous wastes generated,
- Labeling practices and use of appropriate containers,
- Use of a recording or manifest system for transportation, and
- Submission of periodic reports to the EPA or an authorized state agency.

#### ***TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260***

These sections specify the regulations promulgated by the EPA to implement the requirements of RCRA as described above. To facilitate such implementation, the defining characteristics of each hazardous waste are specified in terms of toxicity, ignitability, corrosivity, and reactivity.

## STATE

### ***CALIFORNIA HEALTH AND SAFETY CODE §25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED).***

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control or DTSC, under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt specific criteria and guidelines for classifying such wastes. The act also requires all hazardous waste generators to file specific notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

### ***TITLE 14, CALIFORNIA CODE OF REGULATIONS, § 17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)***

These regulations specify the minimum standards applicable to the handling and disposal of solid wastes. They also specify the guidelines necessary to ensure that all solid waste management facilities comply with the solid waste management plans of the administering county agency.

### ***TITLE 22, CALIFORNIA CODE OF REGULATIONS, §66262.10 ET SEQ. (GENERATOR STANDARDS)***

These sections establish specific requirements for generators of hazardous wastes with respect to handling and disposal. Under these requirements, all waste generators are required to determine whether or not their wastes are hazardous according to state-specified criteria. As with the federal program, every hazardous waste generator is required to obtain an EPA identification number, prepare all relevant manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, all hazardous wastes are required to be handled only by registered hazardous waste transporters. Requirements for record keeping, reporting, packaging, and labeling are also established for each generator.

## LOCAL

There are no local LORS of particular significance with regard to the wastes from the proposed and similar projects.

## SETTING

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### **PROJECT AND SITE DESCRIPTION**

According to information from the applicant (MVPC 2000a, pages 2-1, through 2-6, and page 6.9-1), the proposed project will consist of two existing natural gas-fired units of 66 MW each (that will be refurbished) and two new natural gas fired units of 542.6 MW each. The project will be located on a 16.3-acre site around the location of the existing units in an unincorporated section of San Bernardino County.

Related facilities will include two new connecting 230 kV transmission lines to Southern California Edison's 230 kV San Bernardino Switchyard adjacent to the project, and an existing 115 kV connection to the same Switchyard. This 115 kV line will be operated at 230 kV when all units are operational. Existing buildings include an administrative building, a maintenance shop, and a warehouse. The project site is in a mixed-use area of agricultural, industrial and residential uses.

To assess the likelihood of soil contamination from past industrial or other activities at the project site, Phase I Environmental Site Assessment (ESA) surveys were conducted in 1997 according to procedures specified by the American Society for Testing and Materials (MVPC 2000a, pages 6.12-1 through 6.12-3). As detailed by the applicant, these surveys revealed specific areas of soil and underground water contamination from past industrial activities at the site and surrounding areas.

Phase II assessment surveys were conducted between 1997 and 1999 to (a) delineate the patterns of contamination, (b) identify the contaminants and the levels of contamination involved, (c) identify the sources of these contaminants, and (d) establish the extent of the needed remediation. The applicant intends to complete such mitigation before the start of construction (MVPC 2000a, page 6.12-3).

## **IMPACTS**

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### **PROJECT SPECIFIC IMPACTS**

#### ***CONSTRUCTION RELATED***

As noted by the applicant (MVPC 2000a, pages 6.12-4, 6.12-5, 6.12-8 through 6.12-10) preparation and construction of the proposed plant and related facilities will generate both hazardous and non-hazardous wastes. The non-hazardous component of the construction-related wastes will include waste paper, wood, glass, scrap metal, and plastics, from packing materials, waste lumber, excess concrete, insulation materials, and non-hazardous chemical containers. Management of these wastes will be the responsibility of the applicant's contractors. The applicant has provided estimates of the amounts to be generated along with the methods for their management. These wastes will be segregated, where practical, for recycling. Those that cannot be recycled will be placed in covered containers and removed on a regular basis by a certified waste handling contractor for disposal at a Class III facility.

The relatively small quantities of hazardous materials to be generated during this construction phase will mainly consist of used oil, waste paint, spent solvents, materials, used or batteries, and cleaning chemicals. These wastes will be recycled or disposed of at licensed hazardous waste treatment or disposal facilities (MVPC 2000a, page 6.12-9). The construction contractor will be considered the generator of the hazardous waste produced during construction and will be responsible for compliance with applicable federal and state regulations regarding licensing, personnel training, accumulation limits, reporting requirements, and record keeping.

If contaminated soil is encountered during construction, such contamination will be assessed using procedures that allow for identification of best disposal options (MVPC 2000a, page 6.12-9).

### **OPERATIONS RELATED**

Under normal operating conditions, both hazardous and non-hazardous wastes will be generated at the facility as noted by the applicant (MVPC 2000a, pages 6.12-10 through 6.12-12). The non-hazardous component will include routine maintenance-related trash, office wastes, empty containers, broken or used parts, and used packaging materials and air filters. Some of the wastes will be recycled to minimize the quantity to be disposed of in a landfill. The non-recyclables will be disposed of at a non-hazardous waste disposal facility. The volume of non-hazardous wastes from the proposed and similar gas-fired facilities is typically small and readily accommodated within area disposal facilities. For the proposed facility for example, such wastes are expected to be negligible compared to the capacity available Class III landfills (MVPC 2000a, page 6.12-4).

The operations-related hazardous wastes will include spent air pollution control catalysts, used oil and air filters, used cleaning solvents, and used batteries. As noted by the applicant (MVPC 2000a, page 6.12-13), some of these wastes will be recycled. These will include the spent air pollution control catalysts, used oil from equipment maintenance, and oil-contaminated materials such as rags or other cleanup materials. The non-recyclables will be disposed of in a Class I disposal facility.

### **POTENTIAL IMPACTS ON EXISTING WASTE DISPOSAL FACILITIES**

The applicant provided a listing of the three area non-hazardous waste disposal facilities (Colton, Mid-Valley, and San Timeteo) available for use with respect to proposed project (MVPC 2000a, page 6.12-4). The listing includes information on remaining capacity, location, and anticipated closure year. This information shows that the volume of the waste from project construction and operation would be insignificant relative to available disposal capacity.

As discussed by the applicant (MVPC 12000aa, page 6.12-4), there are three major Class I landfills in California available for the disposal of hazardous wastes from the proposed and similar projects. These are the Laidlaw Landfill in Imperial County, the Kettleman Hills Landfill in Kettleman City, and the Laidlaw Landfill in Kern County. There is a total of more than twenty million cubic yards of disposal space within these landfills, reflecting a total operational life of up to 137 years. The operational lives of these facilities are expected to be lengthened by two factors: (a) the success of the state's waste reduction program in reducing the volume of wastes to be disposed of and (b) the phenomenon of out-of-state disposal of wastes deemed hazardous under California law, but not under federal law. Staff has concluded from all this that adequate disposal space would be available with respect to all hazardous wastes generated during the operational life of the proposed project.

## **CUMULATIVE IMPACTS**

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As noted from the available information, there is adequate capacity in the disposal facilities available with respect to the hazardous and non-hazardous wastes associated with the proposed project. Therefore, staff agrees with the applicant ((MVPC 2000a, page 6.12-13) that the wastes from the construction and operation of the proposed project and its related facilities will not significantly impact the capacity of the these landfills.

## **FACILITY CLOSURE**

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During any type of facility closure (whether temporary or permanent), the primary waste management-related issue of concern would be the potential for significant health impacts from worker or public exposure to hazardous materials on site. In the case of unexpected temporary closure, requirements under existing LORS (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would be adequate to minimize exposures. By contrast, specific contingency plans are required with respect to temporary closures of more than 90-days to ensure removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment.

A specific on-site contingency plan is also necessary, in case of unexpected permanent closure to ensure (a) the removal of hazardous materials and hazardous wastes, (b) the draining of all chemicals from storage tanks and other equipment, and (c) the safe shutdown of all equipment. For all such closures, a specific facility closure plan is required from the applicant at least twelve months before the start of closure-related activities

## **COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

Staff has concluded from the applicant's submittal that their plan for managing the wastes from the project's construction, operation, and closure would be in accordance with existing LORS designed to minimize the potential for human health and environmental effects. The applicant intends in this regard to dispose of all project-related hazardous and non-hazardous only at facilities they have identified as appropriate for such purposes. An EPA identification number will also be obtained because of the applicant's potential status as a hazardous waste generator. Any on-site storage, handling or disposal of hazardous materials will be as required under California Code of Regulations, Title 22, Section 67100 et seq.

## **MITIGATION**

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The adequacy of the applicant's waste management plan is facilitated by their planned implementation of specific mitigation measures (MVPC 2000a, pages 6.12-14 through 6.12-15.) The most significant of these measures include the following:

- Storing hazardous wastes on site for less than 90 days and ensuring that such wastes are stored only in hazardous waste storage areas surrounded by containment structures.
- Ensuring that hazardous wastes are handled and disposed of only by licensed hazardous waste handlers.
- Training facility workers with respect to waste handling, containment and minimization procedures.

Staff will recommend specific conditions of certification to ensure implementation of these and the other facilitative measures.

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

Staff has determined that the applicant's waste management plan for the proposed would be adequate for compliance with LORS designed to minimize the potential for human health and environmental effects.

### RECOMMENDATIONS

Given the acceptability of the applicant's waste management plan, staff recommends that the proposed project be considered acceptable with respect to the potential for waste-related impacts. To ensure implementation of all necessary mitigation measures, staff recommends adoption of the conditions of certification listed below.

## CONDITIONS OF CERTIFICATION

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**WASTE-1.** The project Owner shall ensure that all the contaminated soil is removed from the project site and disposed of at appropriate disposal facilities before the start of construction.

**Verification:** At least thirty days before the start of construction (or as agreed upon with the CEC Project Manager), the project owner shall provide to the CEC Project Manager verification from the San Bernardino County Fire Department, Hazardous Materials Division, verification that the project site is free of soil contaminants as established from the Phases I and II Assessment Surveys.

**WASTE-2.** The project owner, or its designee, shall obtain a hazardous waste generator identification number from USEPA prior to generating any hazardous waste.

**Verification:** The project owner shall keep its copy of the identification number on file at the project site and notify the Compliance Project Manager (CPM) through its initial monthly compliance report.

**WASTE-3.** Whenever aware of any impending waste management-related enforcement action, the project owner shall notify the CPM of any such action whether it is to be taken against the project owner, the waste transporter under contract, or the disposal or treatment facility to be used.

**Verification:** The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action.

**WASTE-4.** Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM, for review and comment, a waste management plan with respect to all wastes generated during construction and operation of the facility. The plan shall include the following at a minimum:

- A description of all expected types of wastes including the estimates of the amounts expected.
- The applicable waste management methods including the treatment methods, treatment facilities, classification procedures, transportation methods, disposal requirements, facility location, and recycling and waste minimization/reduction measures.

**Verification:** No less than 60 days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operations-related waste management plan shall be submitted no less than 60 days prior to the start of operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or on a mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used in the course of the year.

## REFERENCES

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California Environmental Protection Agency and Regional Water Quality Control Boards, 1999. Wastes Allowed for Discharge at Disposal Facilities. April 24.

MVPC (Mountainview Power Company) 2000a. Application for Certification. Mountainview Power Plant. Volumes I and II. Submitted to the California Energy Commission, February 1, 2000.

# LAND USE

Michael E. Berman

## INTRODUCTION

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The Mountainview Power Plant project (MVPP) involves the construction and operation of an expansion to the existing 132 MW (net) Mountainview Power Plant. The expansion would add 1,056 MW (net) of natural gas-fired combined cycle power to an enlarged site. A gas pipeline, wastewater line, and water supply lines will be extended to the site.

The land use analysis of the MVPP focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's consistency with existing and planned land uses. In general, an electric generation project can be incompatible with existing and planned uses when it creates unmitigated noise, dust, public health hazard or nuisance, traffic, visual impacts and when it unduly restricts existing or planned land uses.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

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### FEDERAL

#### ***FEDERAL AVIATION ADMINISTRATION REGULATIONS***

The proposed project is south of the San Bernardino International Airport in the area where land uses could interfere with proper operation of the airport. Federal Airport Regulations govern aspects of land use in the vicinity of airports. These regulations are designed to promote the safety of aircraft operations at the airport.

### STATE

### LOCAL

The proposed project site is in the City of Redlands Sphere of Influence in San Bernardino County, immediately adjacent to the City of San Bernardino. Linear features of the project (i.e. natural gas pipeline, water supply line, and waste water line) would pass through San Bernardino County and the cities of Redlands, San Bernardino, Rialto, Rancho Cucamonga, Fontana, and Colton. Staff reviewed the following land use planning documents for goals, policies, and regulations relevant to the proposed project. A discussion of the project's conformity with applicable goals, policies, standards, and regulations from each of these planning documents can be found in the **COMPLIANCE WITH LORS** subsection of this report.

#### ***CITY OF REDLANDS GENERAL PLAN***

The City of Redlands General Plan was adopted in October 1995 and last amended on December 15, 1998. This General Plan describes the city that present residents believe should emerge in the future. The Redlands General Plan contains the seven

required elements, namely land use, circulation, housing, open space, safety, noise and conservation. There are also optional elements including growth management, city design and preservation, air quality, human services and economic development.

### ***CITY OF REDLANDS ZONING ORDINANCE***

Title 18 of the City of Redlands Municipal Code contains zoning provisions revised on May 2, 2000. The zoning provides definitions and classifications along with details of how development is to occur within each zoning district. Requirements for development include setbacks from property lines, height limits, parking, design review, and landscaping.

### ***CITY OF SAN BERNARDINO GENERAL PLAN***

The City of San Bernardino General Plan was adopted on June 2, 1989. This plan defines the framework by which the City's resources are to be managed and utilized. The General Plan clarifies and articulates the City's intentions regarding the rights and expectations of the general public, property owners, and prospective investors and business interests. The plan informs these groups of its goals, policies, and development standards. The City of San Bernardino General Plan contains the seven mandatory elements and six additional elements, which are urban design, historical resources, economic development, infrastructure/utilities, public services, and parks and recreation.

### ***CITY OF SAN BERNARDINO DEVELOPMENT CODE***

The City of San Bernardino Development Code was adopted in May 1991 and revised in June 1997. It is contained in Title 19 of the City's Municipal Code. The purpose of the Development Code is to promote the public health, safety, general welfare, and to preserve and enhance the aesthetic quality of the City by providing regulations to ensure an appropriate mix of land uses in an orderly manner. The Development Code is a primary tool for the implementation of the goals, objectives, and policies of the San Bernardino General Plan.

### ***CITY OF RIALTO GENERAL PLAN***

The City of Rialto General Plan was approved on March 31, 1992. The General Plan provides comprehensive planning for the future and contains the seven mandatory elements. Estimates of future population, household types and employment base are used to plan land use and facilities in response to changing needs. The seven elements when taken together provide a guide for all aspects of planning in the future.

### ***CITY OF RIALTO ZONING ORDINANCE***

The City of Rialto Zoning Ordinance is located in Title 18 of the City's municipal code. The zoning regulations are made in accordance with the General Plan and are designed to lessen congestion on streets, secure safety from fire and other hazards, prevent the overcrowding of land, promote general health and welfare, provide adequate light and air, and avoid undue population concentration. The

Zoning Ordinance facilitates the adequate provision of transportation, water, sewer, schools, parks and other public amenities.

### ***EAST VALLEY CORRIDOR SPECIFIC PLAN***

The adopted East Valley Corridor Specific Plan is a joint powers planning effort. This specific plan seeks to guide the development in the project area surrounding but not including the project site itself. The Specific Plan is consistent with the General Plans of the three jurisdictions. (i.e., Redlands, Loma Linda, and San Bernardino County).

### ***CITY OF RANCHO CUCAMONGA GENERAL PLAN***

The City of Rancho Cucamonga General Plan was adopted on February 17, 1981 and amended on January 4, 1989. The General Plan represents a formal expression of the community's goals and desires and provides a guide for making decisions about the City's development. The Plan provides the community with a means to determine the relative importance of differing values such as preservation of natural resources, provision of parks and recreational facilities, community appearance and timely provision of public services.

### ***CITY OF RANCHO CUCAMONGA DEVELOPMENT CODE***

The Rancho Cucamonga Development Code was adopted on December 7, 1983 and revised in June 1999. The Development Code sets standards and guidelines to protect and promote the public health, safety, morals, comfort and convenience of City residents. The Development Code implements the goals and objectives of the General Plan guiding future growth to be in accordance with the General Plan. The Development Code protects physical, social, and economic stability of residential, commercial, industrial and other uses within the City to assure orderly and beneficial development, and reduces hazards to the public from inappropriate location, use, or design of buildings and improvements. The Development Code seeks to attain the advantages of comprehensive, orderly, land use and resource planning.

### ***CITY OF FONTANA GENERAL PLAN***

The City of Fontana General Plan was adopted May 11, 1990 and last amended September 2, 1997. This General Plan focuses on the direction and control of anticipated future development. The Plan serves as the blueprint for the long-range physical planning of the City. It contains goals and policies designed to shape the development of the City and protect environmental, social, cultural, and economic resources in the City. The City General Plan also serves to improve coordination of community development activities among all units of government.

### ***CITY OF FONTANA ZONING ORDINANCE***

The City of Fontana Zoning and Development Code was adopted in 1995 and last amended on October 6, 1998. The Zoning and Development Code establishes land use zoning regulations and districts consistent with the General Plan. It encourages the most appropriate use of land, ensures compatibility between uses, provides open space for light, air and preservation of resources, facilitates the timely

provision of infrastructure and facilities, promotes excellent architectural design, and promotes the health, safety and general welfare of citizens of Fontana and visitors.

### ***CITY OF COLTON GENERAL PLAN***

The City of Colton Final Preliminary General Plan was adopted May 5, 1987. This document establishes land use and growth policy to the year 2005. Review and refinement of this preliminary document will lead to formulation and adoption of a final General Plan. The primary purpose of the Final Preliminary General Plan is to present revisions and updates to the 1981 General Plan and to allow for review and comment on proposed policies before a final plan is adopted.

### ***CITY OF COLTON ZONING ORDINANCE***

The City of Colton Zoning Ordinance (Title 18) was adopted on January 14, 1986 and last amended January 10, 1990. The Zoning ordinance provides definitions, provides zones for uses in the City, identifies uses allowed within each zone, and provides requirements including lot size, density, lot dimensions, structure height, building setback, landscaping, and other development specifications dealing with mechanical equipment, parking, trash enclosures and storage areas.

## **ENVIRONMENTAL SETTING**

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The MVPP site is located in San Bernardino County in the City of Redlands. Influence. The City of Redlands is located on the north, east, and west of the property that is now within the City of Redlands.. The City of San Bernardino boundary forms the western boundary of the County of San Bernardino Sphere of Influence. Therefore the project site is located in a pocket of County land between San Bernardino and Redlands. (See **LAND USE Figure 1**) The applicant has had the project site annexed to the City of Redlands.

The natural gas pipeline would be constructed within existing roadway rights-of-way through an urban area containing a mixture of residential, commercial, industrial, and institutional uses such as schools, churches and government facilities. The proposed reclaimed wastewater line would be constructed within existing roadway rights-of-way through an area currently used for agricultural purposes. The wastewater supply line would be extended for approximately 1,100 feet across Twin Creek from an area containing residences in the east to an area with commercial and industrial uses in the west.

## **SITE AND VICINITY DESCRIPTION**

The MVPP would occupy a 54.36-acre parcel of land. Part of the site is developed as a gas-fired power plant that has been in operation since 1957. Most recently the site was operated as a peaking facility. In the western portion of the site there are storage tanks previously used for oil storage that will be used as a part of the project to store water.

The area to the west of the project site across Mountainview Avenue is developed with industrial uses towards the north and residential uses towards the south.

Residential areas extend to the southwest of the project site. Residential uses occur approximately 220 feet from the nearest edge of the storage tanks. The area to the north is open space land used for drainage and the remainder of the eastern portion of the northern boundary is adjacent to agricultural land. The eastern and southern areas adjacent to the project site are currently used as an electrical switching yard and beyond that for agriculture.

The site is located within San Bernardino County. The zoning is Regional Industrial (IR) for the site and for the remainder of the 82 acres that has been annexed to the City of Redlands. (see **LAND USE Figure 2**) The proposed project will only occupy 54.36 acres.

The area north of the project site is zoned FC (Flood Control/Construction Aggregates) by the City of Redlands. Land to the south and east of the area proposed for annexation is zoned Commercial/Industrial (CI) by the City of Redlands. The area to the west of the project site is zoned IH (Industrial Heavy) towards the north and RU-1 (Residential Urban) towards the south by the City of San Bernardino.

## **NATURAL GAS PIPELINE**

Natural gas is proposed to be brought to the site in a new 24- to 30 -inch pipeline that would be installed underground beginning at Etiwanda Avenue and proceeding east on Arrow Route Highway until it turns south on Cherry Avenue and then east on Merrill Avenue. The pipeline continues east on Merrill Avenue, which becomes Mill Street until it turns south on Tippecanoe Avenue and then east on San Bernardino Avenue until it reaches the power plant on the northeast corner of Mountain View Avenue and San Bernardino Avenue. The pipeline would be within an existing roadway right-of-way and would be within a quarter mile of several schools, churches, commercial, industrial and residential uses.

## **WATER SUPPLY LINE**

Cooling water would be obtained from two onsite wells and the Gage Canal Water Company. The project applicant is also considering use of secondary treated effluent from the Redlands Wastewater Treatment Plant.

Water from the Gage Canal Water Company would be obtained from an existing water supply line located adjacent to the project site. Bringing secondary treated effluent to the site will involve construction of a 12- to 16-inch pipeline from the

Insert Figure 1a (11"x17")

Insert Figure 1b (11"x17")

Insert Figure 1c (11"x17")

Insert Figure 2a (11"x17")

Insert Figure 2b (11"x17")

Insert Figure 2c (11"x17")

Redlands Wastewater Treatment Plant south on Nevada Avenue for approximately 0.9 mile, then west on San Bernardino Avenue for approximately 1.4 miles to the project site, all within public road right-of-way. Agriculture is the predominant land use in this area.

## **WASTEWATER LINE**

Wastewater discharge would utilize an existing 12 -inch pipeline that proceeds from the project site to the west for approximately 2.8 miles. A 1,100 -foot length of 12 -inch pipe would be installed underneath Twin Creek Channel to connect the existing unused pipeline to the Santa Anna Regional Interceptor (SARI) discharge line.

## **IMPACTS**

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According to Appendix G (Environmental checklist form) of the Guidelines to the California Environmental Quality Act (CEQA), a project may have a significant effect on land use if the project will:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.

A project may also have a significant impact on land use if it will create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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### ***FEDERAL AVIATION ADMINISTRATION***

Federal Airport Regulations Part 77 Section 77.25 Civil Airport Imaginary Surfaces provides a methodology for calculating the height of structures permitted in the vicinity of an airport. These regulations would permit a structure to reach up to 1,307 feet above mean sea level between 1550 feet and 10,000 feet from the runway centerline.

The FAA requires San Bernardino International Airport operators to implement a number of Sponsor Assurances. These Sponsor Assurances include provisions that require the operator to exercise their power to ensure that:

- Uses in the vicinity of an airport do not attract birds to the area. This regulation is designed to minimize bird strikes.

- Land uses in the vicinity of an airport are not permitted to emit radio frequencies in the 0-140 MHz range in the UHF band. This regulation is designed to prevent interference with airport navigation equipment and voice communications.
- Land uses do not impair visibility by introducing smoke and steam in the area above the airport imaginary surface.
- Land uses do not create turbulence that could affect aircraft.

The proposed project is located at approximately 1,105 feet above mean sea level. (Page 2-1 AFC Volume 1). Proposed exhaust stacks are estimated to be 3,890 feet from the San Bernardino International Airport runway centerline. The project is subject to a height limit for structures of 1,307 feet above sea level. The proposed 200-foot exhaust stacks would reach an altitude of approximately 1,305 feet above sea level. Therefore the proposed steel exhaust stacks are within the range allowed by FAA regulations.

The FAA and the San Bernardino International Airport were contacted to verify the calculations provided above. The FAA and the airport contacts confirm that the imaginary surface is 1,307 feet above sea level.

For a discussion of the potential for the project to increase bird attraction to the area see the **Biology** section.

For a discussion of smoke and steam plumes generated by the project and turbulence see the **Visual** and **Air Quality** sections.

The proposed project is a power plant that is not expected to result in detectable radio waves in the radio frequency ranges of concern to the FAA.

### ***CITY OF REDLANDS GENERAL PLAN***

The site is designated Industrial by the City of Redlands General Plan. The Redlands General Plan Land Use Element policy 4.80c states "Maintain standards for industrial development and operation that prohibit creation of noise, odor, or other harmful emissions beyond the boundaries of the site" (Section 4 Page 42). Policy 4.80d encourages private development of well-designed industrial park subdivisions, which meet high standards of improvement. Further discussion of air quality and noise issues can be found in the **Noise** and **Air Quality** Sections.

The City of Redlands General Plan identifies San Bernardino Avenue and Mountain View Avenue as Major Arterials. The cross-section of these Major Arterials in the General Plan is 110 feet right-of-way with a 14-foot median, four 12 foot travel lanes, and 14 feet from curb to edge of property. Consultations with City Staff indicate that the City would prefer to require the roadway cross-section of the East Valley Corridor Specific Plan for San Bernardino Avenue and the requirements of the Redlands General Plan for a Local Street for Mountain View Avenue north of San Bernardino Avenue. (Personal communication John Jaquess, City of Redlands 8/11/00). This issue is discussed further below.

The required cross-section for San Bernardino Avenue is provided below under the discussion of the East Valley Corridor Specific Plan. The Redlands General Plan identifies a cross-section for a Local Street. A Local Street has a 60-foot right-of-way with 36 feet of pavement and a 12-foot curb on each side. Mountain View Avenue would be required to have a 60-foot right-of-way north of San Bernardino Avenue.

## ***CITY OF REDLANDS ZONING ORDINANCE***

The City of Redlands has approved a pre-zoning of the site to General Industrial (M-2). According to Chapter 18.116 the purpose of the M-2 General Industrial Zone is to: preserve appropriate city lands for heavy industrial uses; protect these lands from intrusion of residential and inharmonious commercial uses; promote uniform and orderly industrial development; foster an efficient and aesthetically pleasing industrial district; attract and encourage the location of desirable industrial plants; and, to provide proper safeguards and appropriate transitions for surrounding land uses.

The M-2 zone lists permitted uses and uses permitted subject to a conditional use permit. Non-nuclear electric generating stations are listed as a use by right (i.e. no use permit would be required), which is allowed in the M-2 zone. The City Planning Commission may permit any other use it determines to be similar to the uses listed in the ordinance.

Within the M-2 zone property development standards of the M1 Zone are applicable. These property development standards require:

1. A minimum lot area of 5,000 square feet.
2. A lot width of 50 feet except where adjacent to a residential zone where a minimum 70 feet lot width is required.
3. Minimum lot depth of 100 feet.
4. Buildings and structures in the M-1 zone shall not exceed 50 feet in height; provided, however, that non-nuclear generating stations, shall not exceed 100 feet in height, and appurtenant cooling towers and emission stacks for non-nuclear generating stations shall not exceed 225 feet in height. (This item was amended at an April 18, 2000 City Council Meeting)
5. A front yard of 25 feet adjacent to a major or secondary highway or where adjacent to or across the street from a residential zone.
6. A minimum of 10 feet of the front yard area shall be landscaped where it adjoins a residential district or a major or secondary highway or a block wall is required adjacent to the residential zone.
7. Minimum 50 feet of access on a dedicated and improved street.
8. Lot coverage not exceeding 50%.
9. Outdoor storage areas are to be enclosed by building walls, a solid masonry wall, solid fencing, or uniformly compact evergreen hedge, continuously maintained and not less than 6 feet in height, located no closer to any street

than the front setback line. Side and rear setback areas are to be treated similarly when viewable from the street.

10. Items stored within 100 feet of a street or a residential zone shall not be stacked greater than 6 feet high.
11. Combustible materials are not to be stored less than 20 feet from an interior lot line.
12. Wastes are to be stored in an enclosed area accessible to service vehicles.
13. Wastes, which create fumes or dust, are to be stored in enclosed containers.
14. Metal buildings are not to be located closer than 150 feet from the property line along a major or secondary highway or closer than 100 feet from the property line along any other dedicated street. An exception is provided where the sheet metal comprises less than 25% of the exterior wall area of a structure, the sheet metal consists of stainless steel baked enamel or similar finishes, or the structure is concealed from public streets by structures, walls, fences and landscaping.
15. One parking space is required for each two employees on the largest shift plus one parking space is required for each vehicle connected with the use.
16. A loading space not less than 10 feet wide, 20 feet long and 14 feet high is required.

The proposed project is consistent with items 1, 2, 3, 4, 5, 7, 8, 11, 12, 14, and 15 because:

- The lot on which the use is proposed meets City of Redlands requirements (i.e. Items 1, 2, 3, and 7).
- The project owner has proposed construction or uses that conform to the City of Redlands requirements (i.e. Items 4, 5, 8, 11, 12, 14, and 15).

The project owner has stated that the proposed improvements are being made under the umbrella of a development agreement with the City of Redlands as a part of annexation of the site. Therefore, the project owner has concluded that setback and landscape issues along Mountain View Avenue and San Bernardino Avenue are “not problematic” and so the project owner has not proposed roadway improvements such as curb and gutter that are consistent with City of Redlands regulations. Therefore, the project is not consistent with City of Redlands street improvement requirements. Provision of the street improvements would ensure the project is consistent with City of Redlands regulations requiring roadway improvements.

The project owner has indicated in response to Data Request 2 Item 143, that landscaping of a 10-foot wide strip within the 25-foot setback is not necessary. The City of Redlands Zoning Ordinance requires a 10-foot wide strip be provided within the 25-foot setback area. Therefore, the proposed project is not consistent with this requirement (Item 6).

The project owner has not indicated what height items stored outdoors on the site may be stacked within 100 feet of a roadway or the type of barrier enclosing areas of the site used for outdoor storage (Items 9 and 10). To comply with Redlands requirements a maximum height of 6-feet within 100 feet of a roadway would be required for outdoor storage and a solid barrier is required to enclose the outdoor storage area.

The project owner has not specified how wastes that create fumes or dust will be stored on the site (Item 13). Storing these wastes in an enclosed container would ensure project compliance with City of Redlands requirements.

The project owner has indicated in response to the second data request (#151) that the MVPP has ample space to conduct loading activities well inside the project site and will therefore not provide a loading dock consistent with Redlands standards. Discussions with City of Redlands staff (Personal communication John Jaquess 9/11/00) indicate that if the City were reviewing the application they would likely waive the loading dock requirement. Therefore, the project is consistent with item 16 that requires a loading dock.

Section 18.116.110 Noise Control of the Redlands Municipal Code does not allow uses in the M-1 zone to operate in a manner that produces noise exceeding 60 CNEL (Community Noise Equivalent Level) when measured at the property line of any property used for residential, hospital, school or park use. Noise issues are discussed in the **Noise** section.

The City of Redlands C-4 Zoning District Sign Ordinance Section 15.36.230 provisions are applicable to the project site within the M-2 Zone. The ordinance allows a maximum overall sign area of the greater of one square foot of sign area for each linear foot of building frontage, up to 120 feet, plus 0.5 feet of sign area for each foot of building frontage in excess of 120 feet or alternatively 0.5 square feet of sign area for each linear foot of lot frontage is allowed.

A Main Identification Sign is allowed that is 1 square foot in area for each linear foot of building frontage, up to 120 linear feet, plus 0.25 square feet of sign area for each foot of building frontage in excess of 120 linear feet, up to a maximum of 300 square feet.

Provisions of Section 15.36.230 seek to ensure that signs located in the project area are related to the architectural style of the structure upon which they are placed. The Planning Commission must approve the location, size, and architectural design of all freestanding signs and support structures. Signs in the district may only contain the name of the company as shown on a City of Redlands Business License, or the owner's name and type of business, or the principal product of the business. Signs mounted on buildings must be placed parallel to the vertical surface of the building and may not extend out more than 12 inches from the furthest surface of the building, marquee, or canopy. An exception is allowed for one projecting sign not exceeding 3 square feet for each street that the building faces.

The Sign Ordinance allows monument signs with an overall height not exceeding four feet and pedestal signs with an overall height not exceeding twelve feet. One freestanding sign per parcel or unified parcel is allowed except where there is more than one major tenant or projects of more than 35 acres. In these cases one freestanding sign is allowed for each major tenant or two signs are allowed on a site greater than 35 acres in extent.

Additional provisions of the City of Redlands Sign Ordinance are:

1. No freestanding signs may be placed so that it obstructs signs on adjacent property from public view.
2. A freestanding sign in excess of 24 square feet is considered a main identification sign. Only one main identification sign is permitted.
3. No freestanding sign may be placed within 40 feet of another freestanding sign.
4. No portion of a freestanding sign may extend over an existing or future right-of-way.
5. The maximum size of a freestanding sign will be 75 square feet for 10-35 acres and 120 square feet for more than 35 acres of project site.
6. Where signs are not visible from the public right-of-way, parking areas or other public areas the Planning Commission may exempt certain signs from the requirements of these provisions.

The project owner has stated that no new signs are proposed and therefore no sign plan will be developed as a part of the project (Second data request, Response 144). The City of Redlands requires that non-conforming signs be replaced with conforming signs when ownership changes but not when expansion of an existing use occurs. Therefore, the project is in compliance with the City of Redlands Sign Ordinance. However, if the project were proposed in the City of Redlands the City would request that the project owner bring any existing non-conforming signs into compliance with the City of Redlands sign ordinance.

### ***CITY OF SAN BERNARDINO GENERAL PLAN***

The City of San Bernardino General Plan Land Use element contains goals and policies related to the provision of public infrastructure. Goal 1E states “Provide for the development of public infrastructure to support existing and future residents, businesses, recreation and other uses. An associated objective (1.5.3) is for the City to set “aside lands for the continued operation and expansion of public infrastructure which supports residents and businesses and protects them from environmental hazards”. Policy 1.5.3 states: “Allow for the continuation and development of utility corridors (energy, sewer, water, telecommunications, etc.) to provide for existing and future land uses; establishing standards for the development of new surface and sub-surface facilities”. The utilities section of the General Plan acknowledges that Southern California Gas Company provides natural gas to the city area and that the company owns, operates and maintains natural gas lines in most city streets.

Only the proposed natural gas pipeline would be subject to the City of San Bernardino General Plan because this is the only physical component of the project that would be within the City limits. The proposed project is consistent with the City of San Bernardino General Plan as proposed proprietary gas line uses in existing rights-of-way are allowed under the General Plan.

### ***CITY OF SAN BERNARDINO ZONING ORDINANCE***

The City of San Bernardino Development Code, Title 19 addresses zoning provisions on private property outside the public roadway right-of-way. The provisions of the ordinance do not address the proposed pipeline because it is proposed for construction in a public roadway right-of-way.

Only the proposed natural gas pipeline would be subject to the City of San Bernardino Zoning Ordinance because this is the only physical component of the project that would be within the City limits. Since there are no provisions in the zoning ordinance pertinent to the pipeline there is no inconsistency between the proposed project gas pipeline and the zoning provisions.

### ***EAST VALLEY CORRIDOR SPECIFIC PLAN***

The East Valley Corridor Specific Plan is a multi-jurisdiction (Loma Linda, Redlands, San Bernardino County) planning document that applies to the design of San Bernardino Avenue improvements (Personal communication John Jaquess City of Redlands 8/11/00). The plan identifies land use and roadway standards for the planning area. The East Valley Corridor Specific Plan specifies the road configuration for San Bernardino Avenue to be 120 feet right-of-way with 52 feet from centerline to curb.

As discussed above the project owner does not believe that it is necessary to provide the street improvements required along San Bernardino Avenue. If the required street improvements are not provided the jurisdictions implementing the Specific Plan requirements may have difficulty providing consistent street improvements along San Bernardino Avenue because the plan assumes development along the corridor will provide it's fair share of the roadway improvements. The proposed project is not consistent with the East Valley Corridor Specific Plan roadway requirements for San Bernardino Avenue.

### ***CITY OF RIALTO GENERAL PLAN***

The City of Rialto General Plan does not address the issue of a natural gas pipeline being constructed or operated underground within roadway right-of-way including Merrill Avenue/Mill Street (a Secondary Highway).

Only the proposed natural gas pipeline would be subject to the City of Rialto General Plan because this is the only physical component of the project that would be within the City limits. The proposed project is consistent with the Rialto General Plan.

### ***CITY OF RIALTO ZONING ORDINANCE***

The City of Rialto Zoning Ordinance (Title 18) does not address the issue of a natural gas pipeline being constructed or located underground within Merrill Avenue/Mill Street.

Only the proposed natural gas pipeline would be subject to the City of Rialto Zoning Ordinance because this is the only physical component of the project that would be within the City limits. The proposed project is consistent with the Rialto Zoning Ordinance.

### ***CITY OF RANCHO CUCAMONGA GENERAL PLAN***

Only the proposed natural gas pipeline would be subject to the City of Rancho Cucamonga General Plan because this is the only physical component of the project that would be within the City limits. The Rancho Cucamonga General Plan Public Health and Safety Element requires that all proposed major utility lines, including gas lines, should be prevented from crossing a potentially active earthquake fault. Where alternative routes are not possible the facility must be designed to minimize hazards for adjacent development. Such systems should include devices capable of shutting off gas flow in the event of a pipeline rupture.

The project owner has not indicated whether shut-off valves will be provided adjacent to geological faults. Installation of shut-off valves where the gas pipeline crosses faults would ensure consistency with this Rancho Cucamonga General Plan policy.

### ***CITY OF RANCHO CUCAMONGA ZONING ORDINANCE***

Only the proposed natural gas pipeline would be subject to the City of Rancho Cucamonga Zoning Ordinance because this is the only physical component of the project that would be within the City limits. The City of Rancho Cucamonga Development Code does not address the issue of a gas pipeline in a public right-of-way.

The proposed project is consistent with the provisions of the City of Rancho Cucamonga Development Code.

### ***CITY OF FONTANA GENERAL PLAN***

Only the proposed natural gas pipeline would be subject to the City of Fontana General Plan because this is the only physical component of the project that would be within the City limits. The City of Fontana General Plan contains no goals, policies, and standards that are relevant to the construction of a natural gas pipeline within an existing street right-of-way.

The proposed project is consistent with the City of Fontana General Plan.

### ***CITY OF FONTANA ZONING ORDINANCE***

Only the proposed natural gas pipeline would be subject to the City of Fontana Zoning Ordinance because this is the only physical component of the project that

would be within the City limits. The City of Fontana Zoning Ordinance contains no provisions that are relevant to the construction of a natural gas pipeline within an existing street right-of-way.

The proposed project is consistent with the City of Fontana Zoning Ordinance.

### ***CITY OF COLTON GENERAL PLAN***

Only the proposed natural gas pipeline would be subject to the City of Colton General Plan because this is the only physical component of the project that would be within the City limits. The City of Colton General Plan contains no goals, policies, and standards that are relevant to the construction of a natural gas pipeline within an existing street right-of-way.

The proposed project is consistent with the City of Colton General Plan.

### ***CITY OF COLTON ZONING ORDINANCE***

Only the proposed natural gas pipeline would be subject to the City of Colton Zoning Ordinance because this is the only physical component of the project that would be within the City limits. The City of Colton Zoning Ordinance contains no provisions that are relevant to the construction of a natural gas pipeline within an existing street right-of-way.

The City of Colton requires that 10 copies of a design review application be submitted along with appropriate fees. The application will be reviewed by an interdepartmental team that may introduce conditions for the construction of the natural gas pipeline proposed between Rancho Avenue and Bordwell Avenue along Merrill Avenue.

Submission and approval of the completed design review application to the City of Colton and implementation of any conditions of approval identified by Rialto will ensure compliance with City of Rialto zoning provisions.

## **COMPATIBILITY WITH EXISTING AND PLANNED LAND USES**

### ***POWER PLANT***

The 54.36-acre site is partly used for an existing natural gas-fired power plant and is designated Industrial in the City of Redlands General Plan. The proposed power plant is consistent with this land use designation and would not result in a change in the planned development pattern of the area as identified in the City of Redlands General Plan. Furthermore, the proposed facility is compatible with the existing industrial character of the immediate surrounding land uses, which include the existing power plant to the west and south, storage to the north, and a utility switchyard to the east with the possible exception of residential uses across Mountain View Avenue. The nearest residential use is located west of Mountain View Avenue and north of San Bernardino Avenue. The residential use is across Mountain View Avenue from the project property adjacent to the row of storage tanks that would be retained as a part of the project. The nearest residences are

single-family homes approximately 86 feet from the western boundary of the project site in an area in the City of San Bernardino zoned RU-1 (Residential Urban). The extent to which these residences would be subjected to increased noise, visual disturbance, and air emissions is addressed in other sections of this report. Please refer to **Noise, Air Quality, Public Health, Visual Resources, and Traffic and Transportation** sections for a discussion of indirect land-use impacts due to construction and operation of the power plant and measures proposed to mitigate those impacts.

## ***GAS PIPELINE***

Staff does not expect that the natural gas pipeline would cause a significant permanent impact to land use. The underground pipeline would be located within roadway right-of-way for the entire length outside the project site. The pipeline would not disrupt or divide the physical arrangement of an established community. The Horizontal Directional Drilling (HDD) method would be used to avoid sensitive habitats that lie along the gas pipeline route. This would minimize impacts on these sensitive habitat lands.

Temporary construction impacts, such as increased dust, noise, and traffic may affect some land uses along the pipeline corridor. Please refer to **Air Quality, Noise, and Traffic and Circulation** sections of this report. Any construction lay down areas would be located on the project site or at the closest rail station or transportation hub (Page 2-75 AFC Volume 1). Control of fugitive dust during construction of the gas pipeline would be ensured by staff's proposed condition of certification in the **Air Quality** Section of this report.

## ***WATER LINE***

Staff does not expect that the new reclaimed wastewater supply line will cause a significant, permanent impact to land use. The underground water lines will be installed within public right-of-way for the entire route. No sensitive lands are known to be located along this route.

Temporary construction impacts, such as increased dust, noise, and traffic may affect some land uses along the pipeline route. Please refer to **Air Quality, Noise, and Traffic and Circulation** sections of this report. Any construction lay down areas would be located on the project site or at the closest rail station or transportation hub (Page 2-75 AFC Volume 1). Control of fugitive dust during construction of the water line would be ensured by staff's proposed condition of certification in the **Air Quality** Section of this report.

## ***WASTEWATER LINE***

Staff does not expect that the new wastewater disposal line would cause a significant, permanent impact to land use. The construction would be limited to an estimated 1,100-foot length that would be bored under an existing drainage channel using Horizontal Directional Drilling techniques.

Temporary construction impacts, such as increased dust, noise, and traffic may affect some land uses along the pipeline route. Please refer to **Air Quality, Noise,**

and **Traffic and Circulation** sections of this report. Any construction lay down areas would be located on the project site or at the closest rail station or transportation hub (Page 2-75 AFC Volume 1). Control of fugitive dust during construction of the wastewater line would be ensured by staff's proposed condition of certification in the **Air Quality** Section of this report.

## **CUMULATIVE IMPACTS**

Cumulative impacts may be caused if a project would have effects that are individually limited but cumulatively considerable when viewed together with effects of related projects.

The proposed project does not require a general plan amendment to ensure that the appropriate land use designation for the proposed use is available on the site. The proposed project would therefore have no contribution to cumulative impacts from past land uses, land uses currently being proposed, and those that are anticipated to be proposed in the future.

## **FACILITY CLOSURE**

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At some point in the future, the project will cease operation and will close down. At that time it will be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The information provided in the AFC did not specifically address the effects of project closure on land use issues and concerns. The proposed MVPP is expected to be in operation for 30 years (AFC Page 2-7). The project owner will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least 12 months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure, and unexpected permanent closure. In the event of temporary facility closure, staff has not identified any LORS from a land use perspective with which the project owner would have to apply. In the event of unexpected permanent closure and dismantling of the facility, staff has not identified any LORS from a land use perspective with which the project owner would have to comply.

## **MITIGATION**

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Staff's proposed conditions of certification would ensure that the MVPP would comply with the Warren-Alquist Act, City of Redlands General Plan, Rancho Cucamonga General Plan, City of Colton requirements, East Valley Corridor Specific Plan, and the Redlands Zoning Ordinance when the project site has been annexed to the City of Redlands.

## CONCLUSION AND RECOMMENDATIONS

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### CONCLUSIONS

#### ***SAN BERNARDINO COUNTY***

There is no consistency determination with San Bernardino County LORS for the MVPP because the site will be within the City of Redlands.

#### ***CITY OF RANCHO CUCAMONGA***

The project as proposed does not comply with City of Rancho Cucamonga requirements that a shut-off valve be installed where the natural gas pipeline crosses an earthquake fault. Provision of the shut-off valves will ensure consistency with the Rancho Cucamonga General Plan.

#### ***CITY OF COLTON***

The project as proposed does not comply with City of Colton requirements that an application and fee be submitted for approval of the proposed natural gas line construction and development of conditions of approval governing the proposed pipeline. Submission of the required application and fees and compliance with conditions of approval will ensure consistency with City of Colton LORS.

#### ***CITY OF REDLANDS***

The project owner has been working on having the proposed project site annexed to the City of Redlands and a development agreement with the City of Redlands. The agreement had not been finalized at the time of report preparation. The City of Redlands anticipates that the agreement would be complete soon. The agreement specifies that the project will be consistent with the existing City LORS. However, it is not clear how this would be assured.

The project as proposed does not comply with all applicable LORS because the project does not propose half-street improvements on San Bernardino Avenue and Mountain View Avenue consistent with the East Valley Specific Plan and Redlands General Plan requirements. Provision of the required street improvements will ensure project consistency with these LORS.

It is not clear that the project owner will comply with applicable LORS that ensure outdoor storage within 100 feet of a roadway will not exceed 6 feet in height and be enclosed in a 6-foot high solid barrier, because the project owner has not indicated the maximum height that storage will be allowed or the nature of the enclosure for outdoor storage. Acknowledgement from the project owner that storage within 100 feet of a roadway will not exceed 6 feet in height and periodic checks that this provision is being complied with, and provision of a solid 6-foot high enclosure will ensure consistency with these LORS.

The project as proposed does not comply with applicable LORS that require 10 feet of landscaping be provided within the 25-foot setback area because the project

owner does not believe that these improvements are necessary. Provision of the required landscaping improvements will ensure project consistency with these LORS.

## RECOMMENDATION

If the Energy Commission certifies the MVPP project, staff recommends that the Commission adopt the following proposed conditions of certification.

## CONDITIONS OF CERTIFICATION

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**LAND-1<sup>1</sup>** To ensure compliance with City of Redlands General Plan requirements, the East Valley Corridor Specific Plan and Public Resources Code Section 25525, the project owner shall:

- Provide the City of Redlands with a half-street along Mountainview Avenue, adjacent to the project site, that includes 18 feet of pavement (as measured from the centerline of Mountain View Avenue), and curb and gutter 12 feet from the MVPP project property line.
- Provide the City of Redlands with a half-street along San Bernardino Avenue that is 60 feet from centerline to property line and 52 feet from centerline to curb.

**Verification:** Within 60 days prior to the start of construction of the MVPP, the project owner shall submit a plan to the CPM for review and approval that identifies roadway improvements including half-street, curb, and gutter that complies with the mitigation measure. Prior to commencement of operations the project owner shall have installed the required roadway improvements and shall submit evidence to the CPM that the improvements have been installed and are ready for inspection.

**LAND-2** To ensure that the project complies with the City of Redlands Zoning ordinance and Public Resources Code Section 25525, the project owner shall:

Ensure that items stored outdoors within 100 feet of a roadway do not exceed 6 feet in height for the life of the project.

**Verification:** During the operation of the MVPP, the project owner shall annually, for the life of the project, submit evidence to the CPM that areas of the MVPP site within 100 feet of any roadway do not have items stacked over 6 feet high. Periodic inspections to verify compliance may be made.

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<sup>1</sup> This mitigation measure was added because of questions associated with the response to the Second Data request.

**LAND-3** To ensure that the project complies with the City of Redlands Zoning ordinance and Public Resources Code Section 25525, the project owner shall:

Provide a landscaping plan to the Energy Commission for approval, for a 10-foot wide strip within the 25-foot setback area, adjacent to San Bernardino Avenue and Mountain View Avenue. The project owner shall construct approved landscaping plan and maintain the landscaping for the life of the project.

**Verification:** Within 60 days prior to the start of construction of the MVPP, the project owner shall submit a landscaping plan to the CPM for review and approval that identifies 10 feet of landscaping within the 25-foot setback area.

The project owner shall construct the landscaping illustrated in the approved landscaping plan and shall provide evidence that the landscaping has been installed and evidence annually to the CPM that the landscaping is being properly maintained.

**LAND-4** To ensure that the project complies with the City of Rancho Cucamonga General Plan and Public Resources Code Section 25525, the project owner shall:

Design and construct the natural gas pipeline to minimize hazards for adjacent development in the vicinity of earthquake faults. The design shall include devices capable of shutting off gas flow in the event of a pipeline rupture located where the pipeline crosses earthquake faults.

**Verification:** Within 60 days prior to the start of construction of the MVPP, the applicant shall submit plans illustrating shut-off valves at earthquake fault zones and shall submit evidence that these valves have been installed prior to operation of the power plant.

**LAND-5** To ensure that the project complies with the City of Colton Zoning Ordinance and Public Resources Code Section 25525, the project owner shall:

Submit 10 copies of a design review application along with a fee of \$210-00 to the City of Rialto. The City of Rialto may introduce conditions for the construction of the natural gas pipeline proposed between Rancho Avenue and Bordwell Avenue along Merrill Avenue that the project owner shall comply with.

**Verification:** Within 60 days prior to the start of construction of the MVPP, the project owner shall submit evidence to the CPM that approval of the Colton design review application has been obtained and shall identify the conditions of approval.

The project owner shall be required to submit evidence of compliance with the conditions of approval monthly during construction and annually thereafter.

## REFERENCES

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- City of Colton Final Preliminary General Plan, May 5, 1987
- City of Colton Title 18 Zoning, No Date
- City of Fontana General Plan, 1990
- City of Fontana Zoning and Development Code, 1995
- City of Rancho Cucamonga Development Code, Revised June 1999
- City of Rancho Cucamonga General Plan, Amended January 4, 1989
- City of Redlands General Plan, Amended December 15, 1998
- City of Redlands Municipal Code, Title 18 Revised September 1999
- City of Redlands Sign Ordinance, Section 15.36.340
- City of Redlands Staff Report, April 18, 2000
- City of Rialto General Plan, Approved March 31, 1992
- City of Rialto Title 18 Zoning, November 1998
- City of San Bernardino Development Code Title 19, Revised June 1997
- City of San Bernardino General Plan, Adopted June 1989
- Mountainview Power Company, LLC Application for Certification Mountainview Power Plant, Volumes 1 and 2, (MVPC 2000A)
- Mountainview Power Company, LLC Response to Data Request 1, 2000k (MVPC 2000k)
- Mountainview Power Company, LLC Response to Data Request 2, Sept, 2000 (MVPC 2000 II)
- San Bernardino County, East Valley Corridor Specific Plan, No Date



# TRAFFIC AND TRANSPORTATION

Ron Foster

## INTRODUCTION

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The Traffic and Transportation section of the Staff Assessment (SA) addresses the extent to which the Mountainview Power Company (MVPC), Limited Liability Corporation, (LLC) power plant expansion project may impact the transportation system in the local area. This analysis includes the identification of: the roads and routings which are proposed to be used for construction and operation; potential traffic related problems associated with the use of those routes for construction and operation of the project; the anticipated number of trips to deliver oversize/overweight equipment; the anticipated encroachment upon public rights-of-way during the construction of the proposed project and associated facilities; and the frequency of trips and probable routes associated with the delivery of hazardous materials.

Information from the MVPC Application for Certification (MVPC 2000, AFC), as well as other resources were used to determine whether the project has the potential to have significant traffic and transportation impacts, as well as to assess the availability of mitigation measures which could substantially reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations and Standards (LORS).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- Title 49, Code of Federal Regulations, section 171-177, governs the transportation of hazardous materials, the type of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, section 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials and substances over public highways.
- Title 14, Code of Federal Regulation, Section 77.13(2)(i), requires an applicant to notify the FAA of construction of structures with a height greater than an imaginary surface extending outward and upward at a slope of 100 to 1 from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 feet in length.
- Title 14, Code of Federal Regulations, Section 77.17, require an applicant to Notice of Proposed Construction or Alteration (FAA Form No. 7460-1) to the FAA.

- Title 14, Code of Federal regulation, Section 77.21, 77.23, and 77.25 outline that criteria used by the FAA to determine whether an obstruction would create an air navigation conflict

## STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and right-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, section 353 defines hazardous materials.
- California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams.
- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials.
- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.
- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.4, 34501.10, 34505.5-7, 34507.5 and 34510-11, regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Vehicle Code, sections 2500-2505, authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulate right-of-way encroachment and the granting of permits for the encroachment on state and county roads.

- California Health and Safety Code, sections 25160 et seq., address the safe transport of hazardous materials.

## **COUNTY**

The San Bernardino County General Plan (Transportation and Circulation Element) establishes local goals and policies related to transportation operations and improvements.

California Government Code 65088: Legislation establishing Countywide Congestion Management Program (CMP). The program sets standards for traffic levels of service, for freeway, arterial and intersection level of service analysis methodologies, capital improvement programs and other transportation and land use measures. The program is administered by the County Congestion Management Agency (CMA). The San Bernardino Associated Governments (SANBAG) serves as the San Bernardino County CMA.

County Ordinance 8-15: San Bernardino County requires an Excavation Permit for any project that conducts excavation in the County roadways. No separate Encroachment Permit is required upon approval of the Excavation Permit. The County requires an Oversize Vehicle Permit (California Vehicle Code Section 35780) for the transporting of oversize or excessive loads on county roadways.

## **CITIES**

Several communities would be potentially affected by the proposed project. The communities include, Colton, Fontana, Loma Linda, Rancho Cucamonga, Redlands, Rialto and San Bernardino. These communities have LORS that address traffic conditions that might be encountered in the construction and operation of the project. While all incorporated communities adhere to County CMP standards, cities can and do set traffic level of service standards for local roadways that are often more stringent than the CMP requirements. The Mountainview generating plant is presently located in unincorporated San Bernardino County and the City of Redlands is in the process of annexing this facility.

The following paragraphs outlines the relevant LORS for each of the communities where construction may affect traffic.

### **CITY OF SAN BERNARDINO**

The City of San Bernardino requires the preparation of a Street/Utility Improvement Plan when an extensive length of trench will be made in the city streets. Upon the city's approval of the Street/Utility Improvement Plan a separate Encroachment Permit or Street-Cut Permit is not required. If the project will impede the normal progression of traffic the city requires a comprehensive Traffic Control Plan (TCP). Separate Lane-Closure Permits or Oversize Vehicle Permits are not required after approval of the comprehensive Traffic Control Plan. The city mandates that no trench work can be done between the last week of November to the following January 1<sup>st</sup> of any year.

The minimum accepted LOS standard for city arterials and signalized intersections is LOS D.

#### **CITY OF RANCHO CUCAMONGA**

The City of Rancho Cucamonga requires a Construction Permit (City Ordinance 12-03) and a TCP (City ordinance 12-03,140) for projects that would require excavation in the city streets. Separate Encroachment Permit or Street-Cut Permits are not required once the Construction Permit is approved.

The minimum accepted LOS standard for city arterials and signalized intersections is LOS D.

#### **CITY OF COLTON**

The City of Colton requires a Street-Cut permit (City Ordinance 8-75) and a TCP (no specific ordinance or code – California Department of Transportation Manual Section 5-1.1) for any project that would require excavation in the city streets. No separate Encroachment Permit is required upon approval of the Street-Cut Permit. Colton requires for its streets, that patches for all trenches satisfy the city's standard, and trenches exceeding 400 feet in length, require paving of the entire lane.

The minimum accepted LOS standard for city arterials and signalized intersections is the CMP standard LOS E.

#### **CITY OF REDLANDS**

For any project that requires excavation in the city streets the City of Redlands requires an Encroachment Permit (City Ordinance 12-16). For any oversized vehicles traveling on city streets not designated truck routes requires a Truck Route Permit (City Ordinance 10-54). Separate Oversize Vehicle Permits are not required upon approval of the Truck Route Permit.

The minimum accepted LOS standard for city arterials and signalized intersections is LOS C.

#### **CITY OF RIALTO**

A Construction Permit (Municipal Code 11.04) and a TCP must be obtained from the City of Rialto for projects that require excavation in the city streets. No separate Encroachment Permit or Street-Cut permits are required upon the approval of the Construction Permit.

The minimum accepted LOS standard for city arterials and signalized intersections is the CMP standard LOS E.

#### **CITY OF FONTANA**

The City of Fontana requires an Excavation Permit (City Ordinance 17-61) and a TCP (no specific ordinance or code – California Department of Transportation Manual Section 5-1.1) for any project that requires excavation in the city streets.

The City of Fontana uses the California Department of Transportation Manual, no separate Encroachment Permit is required upon approval of the Excavations Permits.

The minimum accepted LOS standard for city arterials and signalized intersections is LOS C.

#### **CITY OF LOMA LINDA**

Project construction traffic and oversize vehicles would not likely travel on Loma Linda streets, however, the two I-10 interchanges (at Tippecanoe Avenue and Mountain View Avenue) nearest the project site are located in the City of Loma Linda at the boarder of the City of San Bernardino. The I-10/Tippecanoe eastbound ramps currently operate at unacceptable LOS F during the PM peak hour.

The minimum accepted LOS standard for city arterials and signalized intersections is the CMP standard LOS E.

## **SETTING**

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### **REGIONAL DESCRIPTION**

#### ***FREEWAYS AND HIGHWAYS***

The project site is located in an unincorporated area of southeast San Bernardino County on San Bernardino Avenue between the cities of Redlands and San Bernardino as shown in **TRAFFIC AND TRANSPORTATION Figure 1**. Access to the project area is provided by a system of freeways, highways and local roadways. The San Bernardino Freeway (I-10) passes from east to west approximately 0.75 miles south of the project. This is a major east-west freeway that provides access west to Los Angeles and east to the desert communities. Interstate 215 (I-215) provides north-south freeway access to Riverside and San Diego Counties to the south and the high desert communities to the north. I-215 is located approximately two miles west of the plant site. State Route 30 (SR 30) located approximately two miles east of the plant site provides local east-west service between I-215 and western San Bernardino County. Mountain View Avenue provides the nearest access point from the power plant to the freeway. The I-10 interchange at Mountain View Avenue is located approximately 0.75 miles south of the site.

The major north-south roadways in the area of the power plant include:

- Mountain View Avenue – This is an undivided two-lane roadway located on the west side of the plant site.
- Alabama Street – This is an undivided two-lane roadway approximately 1.5 miles east of the plant site. Alabama is a primary arterial connecting the City of Redlands to the community of Highland.

- California Street – This is an undivided two-lane roadway 0.75 miles east of the plant site and provides an access corridor from I-10.

The major east-west roadways in the area that could be impacted by the power plant include:

- San Bernardino Avenue – This is a two-lane secondary arterial located south of the plant site and adjacent to it. The segments of this road that would be affected by the project gas pipeline are located in the cities of Redlands and San Bernardino.
- Lugonia Avenue – This is a major arterial that parallels I-10 approximately 0.5 miles south of the site.

Construction of the project natural gas pipeline would take place entirely within existing rights-of-way of city streets. The pipeline as proposed would run through the following Cities; Colton, Fontana, Rancho Cucamonga, Redlands, Rialto, and San Bernardino. The proposed gas pipeline route is shown on **TRAFFIC AND TRANSPORTATION Figure 2**.

Roadways that would be impacted by the construction of the pipeline include:

- Arrow Route Highway – This highway is a two-lane undivided east-west primary arterial. The segments of this arterial that would be affected by the gas pipeline are located in the City of Rancho Cucamonga and unincorporated San Bernardino County.
- Cherry Avenue – This is a four-lane north-south major arterial, with a center median between Arrow Route Highway and Merrill Avenue. The segments of this arterial that would be affected by the gas pipeline are located in unincorporated San Bernardino County.
- Merrill Avenue – This is an east-west secondary arterial east of Cherry Avenue. Merrill Avenue is a four-lane undivided arterial except for that portion of the avenue between Cherry Avenue and Beech Avenue and is a two-lane undivided arterial between Cedar and Riverside Avenues. The segments of this arterial that would be affected by the gas pipeline are located in unincorporated San Bernardino and the Cities of Fontana and Rialto.
- Mills Street - This is the continuation of Merrill Avenue. Mills Street is a four-lane divided primary arterial except for that portion of the street between Rancho Avenue and Mount Vernon Avenue where it is two-lanes. The segments of this arterial that would be affected by the gas pipeline are located in unincorporated San Bernardino County and the Cities of Colton and San Bernardino.

Figure 1

- Tippecanoe Avenue – This is a north-south four-lane divided primary arterial east of Mill Street. The segments of this arterial that would be affected by the gas pipeline are located in the City of San Bernardino.

## PLANNED ROADWAY IMPROVEMENTS

There are no near term roadway improvements planned to the local roadway system in the vicinity of the project site. The I-10 interchange at Mountain View Avenue has recently been signalized (Barton 2000) and a Caltrans Project Study Report (PSR) for improvements to the I-10 interchange at Tippecanoe Avenue is underway and is expected to be finalized next year. Currently there is no schedule for when improvements at this interchange would be constructed. County staff has estimated that it could be at least three years before the construction of improvements would begin on this interchange (Saylor 2000).

**TRAFFIC AND TRANSPORTATION Table 1, Current Characteristics of Roadways in the Project Area** identifies the jurisdiction, physical characteristics, annual average daily traffic (AADT), annual average peak hour traffic, and peak hour (AM/PM) levels of service (LOS) for freeways, highways and arterial roadways in the vicinity of the project. The information shown was obtained from the Caltrans 1998 Traffic Volumes on California State Highways publication, the SANBAG CMP, 1999 Update and MVPC 2000, AFC, Table 6.5-1. The traffic estimates for freeways are presented as averages for several segments between mileposts or interchanges on each freeway.

LOS refers to the average vehicle capacity and the overall flow of traffic. LOS A denotes free flow of traffic while LOS E and F means that there is a congested flow. The LOS criteria take into account numerous variables such as annual average daily traffic (AADT), lane capacity, grade, vehicle speed, vehicle delay, and other relevant information. A threshold of LOS E is the minimum standard accepted by the County Congestion Management Agency for the designated CMP system of roadways. All of the roadway segments shown in **Table 1** are part of the CMP system with the exception of the Merrill Avenue segment (approximately 7-miles long) between Riverside Avenue and Cherry Avenue.

Figure 2

**TRAFFIC AND TRANSPORTATION TABLE 1**  
**Current Characteristics of Roadways in the Project Area**

Jurisdiction	Segment	Between	Median	Lanes	ADT	AM Peak Hour	AM LOS	PM Peak Hour	PM LOS
Caltrans	I-10	I-215 & Mt. View	Divided	8	170,000	11,900	F	13,200	F
Caltrans	I-215	I-10 & Mill	Divided	8	160,000	11,700	F	13,000	F
Ran Cuc/SB Co.	Arrow Route	Etiwanda & Cherry	Undivided	2	13,000	1,110	D	1,370	F
Fontana/SB Co.	Cherry	Arrow & Merrill	Divided	4	19,000	1,620	B	2,000	B
Fontana/SB Co.	Merrill	Cherry & Beech	Undivided	2	8,000	480	B	810	C
Fontana/SB Co.	Merrill	Beech & Citrus	Undivided	4	9,000	550	B	900	B
Fontana	Merrill	Citrus & Sierra	Undivided	4	14,000	1,190	B	1,470	B
Fontana	Merrill	Sierra & Alder	Undivided	4	13,000	1,110	B	1,370	B
Fon/SB Co./Rialto	Merrill	Alder & Cedar	Undivided	4	8,000	450	B	800	B
Rialto	Merrill	Cedar & Riverside	Undivided	2	7,000	600	B	740	B
Rialto/SB City	Merrill/Mill	Riverside & Pepper	Undivided	4	15,000	1,280	B	1,580	B
SB City	Mill	Pepper & Rancho	Divided	4	11,000	940	B	1,160	B
Colton	Mill	Rancho & Mt. Vernon	Undivided	2	14,000	1,190	E	1,470	F
SB City	Mill	Mt. Vernon & "E" St.	Divided	4	24,000	2,040	B	2,520	C
SB City	Mill	"E" St & Waterman	Divided	4	14,000	1,190	B	1,470	B
SB City	Mill	Waterman & Tippecanoe	Divided	4	7,000	600	B	740	B
SB City	Tippecanoe	San Bernardino & Mill	Divided	4	22,000	1,870	B	2,310	C
SB Co./Redlands	San Bernardino	Tippecanoe & Mt View	Undivided	2	10,000	850	C	1,050	D
Redlands	San Bernardino	Mt View & California	Undivided	2	3,000	360	B	300	B
SB Co./Redlands	San Bernardino	California & Alabama	Undivided	2	4,000	340	B	420	B
Redlands	San Bernardino	Alabama & SR-30	Undivided	2	4,000	340	B	420	B
SB City/Redlands	Mt View	I-10 EB Ramp & San Bern	Undivided	2	8,000	700	B	800	C

Source: Caltrans 1998 Traffic Volumes Publication  
 CMP San Bernardino County, 1999 Update (Appendix A, Table A-2).  
 MVPC 2000, AFC Table 6.5-1, Page 6.5-5

The SA peak hour LOS results (**Table 1**) differ from those shown in the MVPC 2000, AFC Table 6.5-5. The SA determined roadway segments LOS per the CMP guidelines (Appendix A, Table A-2). The AFC used an overall design capacity to average daily volume analysis. Overall, the LOS findings do not vary significantly in that both analysis approaches identify the two segments (Arrow Route and Mill) which operate at below the minimum CMP standard of LOS E. The SA uses the CMP analysis approach based on direct communications with the County Congestion Management Agency (Wirts 2000, pers. comm.).

**TRAFFIC AND TRANSPORTATION Table 2, Peak Hour Level of Service for Intersections** provides an overview of the peak hour CMP intersection conditions prior to construction and operation of the expanded facility. **Table 2** shows operating conditions at locations along the proposed gas pipeline route and at the freeway ramps located closest to the site. The LOS intersection findings differ from those provided by the applicant (MVPC 2000a) due in part to the different analysis methodology used. **Table 2** provides intersection LOS directly from the CMP, 1999 Update (Table A-1) or from information provided by Caltrans and other local agencies. The required approach for CMP intersections analysis is detailed in the Highway Capacity Manual (Chapter 11). **TRAFFIC AND TRANSPORTATION Table 3, Level of Service Criteria for CMP Signalized Intersections** shows the level of service criteria for CMP signalized intersections. LOS is expressed in vehicle delay and delay is in terms of seconds per vehicle. **TRAFFIC AND TRANSPORTATION Figure 3** shows the location of study area intersections.

<b>TRAFFIC AND TRANSPORTATION Table 2</b> <b>Peak Hour</b> <b>Intersection Levels of Service</b>				
Location	AM Peak Hour		PM Peak Hour	
	LOS	Delay	LOS	Delay
Etiwanda & Arrow Route**	B	10.0	C	23.0
Cherry & Arrow Route*	B	10.0	C	18.0
Citrus & Merrill**	B	10.0	B	10.0
Sierra & Merrill**	B	10.0	D	30.0
Cedar & Merrill**	C	20.0	C	20.0
Riverside/Bloom & Merrill*	C	19.0	D	30.0
Pepper & Mill*	C	15.0	C	17.0
Mount Vernon & Mill*	C	23.0	D	25.0
Rancho & Mill*	B	5.0	B	5.0
E St./Inland Ctr. & Mill*	D	27.0	D	31.0
Waterman & Mill*	B	14.0	C	19.0
Tippecanoe & Mill*	B	9.0	B	12.0
Tippecanoe & S.Bernardino*	B	12.0	B	10.0
Tippecanoe & I-10 W. ramps**	C	25.0	C	23.0
Tippecanoe & I-10 E. ramps**	C	27.0	F	82.0
Mt. View & San Bernardino*	C	11.0	B	8.0
Mt. View & I-10 W. ramps**	C	30.0	C	30.0
Mt. View & I-10 E. ramps**	C	30.0	C	30.0

Source: Caltrans 1998 Traffic Volumes Publication.

\*CMP San Bernardino County, 1999 Update (Appendix A, Table A-1).

\*\* Direct communication with local jurisdictions.

<b>TRAFFIC AND TRANSPORTATION Table 3</b> <b>Level of Service Criteria for CMP Signalized Intersections</b>	
Level of Service	Stopped Delay Per Vehicle (Seconds)
A	<5.0
B	>5.0 and < 15.0
C	>15.0 and < 25.0
D	>25.0 and < 40.0
E	>40.0 and < 60.0
F	>60.0

Source: Highway Capacity Manual, Special Report 209, TRB 1994, Chapter 11, Page 9-6, Table 9-1.

The intersections shown in Table 2 operate within acceptable thresholds at both the CMP and local jurisdictional levels with the exception of the I-10 / Tippecanoe eastbound ramps. The signalized intersection at this location operates at LOS F during the PM peak hour, which is below the minimum acceptable CMP threshold of LOS E. This intersection, as noted is currently under study as part of the Caltrans I-10/Tippecanoe Avenue interchange PSR.

Figure 3

## **AIRPORT**

The MVPC project site is located approximately 4,000 feet south of the San Bernardino International Airport. The airport was formerly known as Norton Air Force Base. The airport was closed in 1994 and the facility was transferred to the local community. The facility is managed by a regional joint authorities composed of the Inland Development Agency and San Bernardino International Airport Authority. The 2,100 acre airport facility is a full service commercial airport with a 10,000 foot runway, a terminal area and aircraft maintenance facilities.

Traffic volumes at the airport in 1999 totaled 30,000 take-offs and landings. Current available airport data ([www.airnav.com](http://www.airnav.com)) indicates that airport operations average 195 per day and are split approximately at 60 percent local general aviation and 40 percent transient general aviation. Airport traffic volume is expected to increase in both cargo flights and passenger flights. Currently, there is no air traffic control to direct aircraft operation in and around the airport. Aircraft using the facility communicate with each other on a common radio frequency. The airport has an instrument landing system (ILS) which is available for aircraft landing on Runway-6 from the east.

## **RAILROADS**

The Burlington-Northern & Santa Fe (BN&SF) Railroad operates in the vicinity of the project. The BN&SF railroad line runs in a generally east-west direction south of the project plant site. This line provides freight service for the industrial users in the project area. BN&SF line crossings exist at Mountain View Avenue south of the power plant site, Mill Street approximately 0.25 miles west of the intersection of Mill Street and Waterman Avenue, and at Cherry Avenue approximately 0.125 miles north of Merrill Avenue.

Metrolink is a primary commuter/passenger rail system in southern California. Metrolink operates a line that runs in an east-west direction north of the project's proposed natural gas pipeline route. Metrolink will not be impacted by the pipeline or plant construction.

## **BUS ROUTES**

Omnitrans provides public bus transportation in the vicinity of the project and is the regional operator for San Bernardino County. Omnitrans provides fixed bus service, dial-a-ride service and dial-a-lift service for the handicapped. The following bus routes may be affected by the proposed natural gas pipeline route:

- 67-Fontana/Chaffey College – Travels on Arrow Route (between Mulberry Avenue and Cherry Avenue). Route operates weekdays between 6:00 AM and 8:00 PM on one-hour headway's.
- 20-Fontana/Metrolink/Kaiser – Travels on Merrill Avenue (between Hemlock Avenue and Sierra Avenue). Route operates weekdays between 5:45 AM and 7:40 PM on 30-minute headway's.

- 15-Fontana/Rialto/San Bernardino – Travels on Merrill Avenue (between Alder Avenue and Eucalyptus Avenue and Rancho Avenue and E Street). Route operates weekdays between 5:00 AM and 8:00 PM on one-hour headway's.
- 8/9-San Bernardino/Mentone/Yucaipa – Travels on Tippacano Avenue (between Rialto Avenue and Barton Avenue). Route operates weekdays between 5:45 AM and 7:40 PM on 30-minute headway's.
- 30/31-N. Redlands Loop/S. Redlands Loop – Travels on San Bernardino Avenue (between Alabama Avenue and University Avenue). Route operates weekdays between 6:30 AM and 7:00 PM on one-hour headway's.

Other Omnitrans routes going north-south will cross the proposed natural gas pipeline route. These routes could experience temporary delays during pipeline construction. The routes include:

- Route 1-Colton/Del Rosa
- Route 2-Cal State/E Street/Loma Linda
- Route 22-N. Rialto/S. Rialto
- Route 29 Fontana/Cedar/N. Rialto
- Route 66-Fontana/Foothill/Montclair

## **BIKE ROUTES**

The natural gas pipeline construction could affect two bicycle routes in the area of the project. One of the bike routes is located in the City of Fontana along Merrill Avenue between Mango Avenue and Alder Avenue. This bike route crosses Merrill Avenue at Citrus Avenue, Juniper Avenue and Mango Avenue. It is classified as a Class III Bikeway, which by Caltrans standards has no special lane markings. A Class III bikeway is identified as a bicycle facility by "Bike Route" signs and its right of way is shared with pedestrians and motorists.

The other bike route is located in the City of Rialto. This bike route is classified as a Class II Bikeway. Class II Bikeways standards provide a restrictive right of way designed for the exclusive or semi-exclusive use of bicycles. The bike lane crosses Merrill Avenue at Cactus Avenue.

## **IMPACTS**

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The California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations, Section 15000, Appendix G, Item XV.) indicates that a project could have a significant effect on traffic and transportation if the project will:

- Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the highway and road system (i.e. result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

- Exceed, either the individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate parking capacity.
- Result in inadequate parking capacity.
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

## **POWER PLANT**

### ***CONSTRUCTION PHASE***

#### **COMMUTER TRAFFIC**

Construction for this project is planned to begin in early 2001, with testing and startup occurring between February and May 2003. It is expected that the majority of the construction workforce will travel to the plant site by I-10 exiting at Mountain View Avenue. This is the nearest access point from the interstate. The workforce will then access the plant site via Mountain View Avenue. Construction access for the project will be from the west off of Mountain View Avenue through a gated entrance. The workforce is expected to peak in the 11<sup>th</sup> and 12<sup>th</sup> month at 568 employees (AFC Pg. 2-71).

#### **TRUCK TRAFFIC**

Construction of the generating plant will require the use and installation of heavy equipment and associated systems and structures. Heavy equipment will be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment. In addition to deliveries of heavy equipment, construction materials such as concrete, wire, pipe, cable, fuels and reinforcing steel will be delivered to the site by truck. Deliveries will also include hazardous materials to be used during construction, such as gasoline, diesel fuel, motor oil, hydraulic fluid, various lubricants, solvents, cleaners, sealers, welding flux, and paint materials. It is expected that a majority of the equipment and materials will be transported from the Los Angeles area and come to the plant site by way of the Mountain View exit from Interstate 10.

Truck deliveries of construction equipment and supplies are expected to peak in the ninth month after construction starts. It is estimated that 265 truck deliveries will be made during the peak month. Assuming 20 average workdays per month and 2 trips for each truck delivery (one to and one from the site), the project will generate approximately 26 truck trips per day in the peak month. These deliveries are expected to occur between the hours of 6:00 a.m. and 6:00 p.m. on weekdays.

Deliveries of heavy equipment are to be made during the seventh and eleventh month after construction begins. Heavy equipment deliveries will peak at 36 truck deliveries in the ninth month or approximately 2 deliveries per day. These deliveries are expected to occur between the hours of 6:00 a.m. and 6:00 p.m. on weekdays.

### ***Total Project Construction Traffic***

**TRAFFIC AND TRANSPORTATION Table 4, Vehicle Construction and Equipment Delivery Traffic Volumes** shows the estimated number of construction worker vehicle trips, construction truck deliveries and the deliveries of heavy equipment distributed over a monthly and daily period of construction. The MVPC has assumed that construction traffic and truck deliveries would originate in the Los Angeles area and exit at the Mountain View Avenue interchange from I-10. In **Table 4** it is assumed that each construction worker would drive to the plant site alone. The number of construction workers was then multiplied by two to account for travel to and from the plant site in order to determine the number of vehicle trips. These trips were then added to the truck trips generated by the delivery of construction materials and heavy equipment. Heavy equipment deliveries were converted to equivalent car trips. The equivalent of three cars per heavy equipment delivery was used for the conversion (AFC, Pg. 6.5-21). As indicated in **Table 4** the peak vehicle trip days would occur in the eleventh and twelfth months.

The level of service for Mountain View Avenue would be affected during the construction period by project generated vehicle activity. Mountain View Avenue is identified as part of the CMP Roadway System and currently operates at LOS B during the AM peak hour and LOS C during the PM peak hour. A worst case analysis (month 12 of construction) was conducted to estimate the potential impact of construction related traffic on Mountain View Avenue during peak month, peak hour operations. The worst case includes all 568 workers arriving at the site during the AM peak hour and departing during the PM peak hour. The analysis also includes 10-percent of the daily truck traffic (3.2 truck trips) occurring during each peak hour for a total of 571 new trips during the AM and PM peak hours. This level of project traffic represents an increase of 82 percent over existing AM peak hour levels and 71 percent over the existing PM peak hour levels of Mountain View Avenue traffic.

The worst case analysis results in LOS F operations during the AM and PM peak hours. LOS F is an unacceptable operating condition under both the CMP and the City of San Bernardino standards, and would be considered a significant project impact. A reduction of 25 percent of the AM project trips (143 trips) and 30 percent (171 trips) of the PM peak hour project trips results in acceptable LOS D conditions under both the CMP and the City of San Bernardino LOS standards (CMP threshold LOS E, City of San Bernardino threshold LOS D).

### **RAILWAYS**

MVPC has indicated that most of the heavy equipment items will be transported by rail to a common shipping depot nearest the site. The rail deliveries will be off-loaded and transported to the site by common carrier or heavy equipment haulers.

The preferred rail line would be the Burlington Northern & Santa Fe Railroad (BN & SF). This railroad operates an active intermodal freight yard in the City of San Bernardino approximately six miles west of the project site. The freight yard is located south of Rialto Avenue and east of and adjacent to Lytle Creek Channel (Glover 2000). The yard is equipped with heavy-duty cranes and truck loading facilities. The BN & SF Yard could be used as the delivery point. From this location the equipment would be loaded on to trucks for transport to the project site. The trucks could travel east on Rialto Avenue to Mt. Vernon Avenue, south on Mt. Vernon Avenue to I-10, east on I-10 to Mountain View Avenue, north on Mountain View Avenue to the Project. This would be a travel distance of approximately eight miles from the rail terminal.

**TRAFFIC AND TRANSPORTATION Table 4**  
**Vehicle Construction and Equipment Delivery Traffic Volume**

Months	Construction Man-power	Vehicle Trips Per Day	Construction Truck Deliveries Per Month	Truck Trips Per Month	Vehicle Trips Per Day (Trucks)	Heavy Equipment Deliveries Per Month	Heavy Equipment Trips Per Month	Heavy Equipment Trips Per Day	Total Vehicle Trips Per Day	Mountain View Avenue Average Daily Construction Trips
1	80	160	67	134	10					170
2	112	224	96	192	14					238
3	130	260	119	238	18					278
4	156	312	149	298	22					334
5	170	340	175	350	26					366
6	232	464	204	408	31					495
7	268	536	229	458	34	33	66	3	5	575
8	347	694	250	500	38	31	62	3	5	736
9	412	824	265	530	40	36	72	4	5	869
10	492	984	240	480	36	30	60	3	5	1,025
11	567	1134	218	436	33	4	8	.5	1	1,167
12	568	1136	214	428	32					1,168
13	517	1034	172	344	26					1,060
14	389	778	161	322	24					802
15	325	650	130	260	20					670
16	260	520	117	234	18					538
17	203	406	102	204	15					421
18	156	312	81	162	12					324
19	82	164	53	106	8					172

SOURCE: MVPC 2000. AFC , TABLES 2.15-1,2,3

## **OPERATIONAL PHASE**

### **COMMUTE TRAFFIC**

Potential long-term traffic impacts are associated with the facility's operational workforce. Operation of the generating plant will require a labor force of approximately 33 full-time employees. This labor force will be composed of 18 shift operators, eight plant support staff, and seven management staff. Support staff and management staff will be working an eight-hour a week schedule Monday through Friday. The shift operators will be working on an 8-hour shift rotation with four operators on during a shift. Assuming that each employee will drive a separate vehicle to work and that they will make one round trip from home to work per day, operation of the plant will generate approximately 46 vehicle trips per day. During the morning peak hours there will be a peak of 19 vehicle trips entering and four vehicle trips leaving the power plant. During the evening peak hours there will be four vehicle trips entering and 19 vehicle trips leaving the power plant.

It is assumed that the permanent workforce will reside in communities surrounding the power plant. The preferred route for these employees will be along I-10 exiting at the Mountain View Avenue exit and going north to the plant site. The workforce would then enter the power plant from Mountain View Avenue or turning east on to San Bernardino Avenue before turning north into the plant site. Mountain View Avenue from the I-10 exit to the plant site has a LOS rating of B while San Bernardino Avenue east of Mountain View has a LOS rating of B during the AM peak hour and LOS C during the PM peak hour. The additional traffic associated with the operating personnel will not change the existing LOS. Therefore transportation impacts associated with the power plant operating personnel are not expected to be significant.

### **TRUCK TRAFFIC**

The facility will have truck traffic associated with the deliver of various cleaning chemical, gasoline and diesel fuel, lubricants, aqueous ammonia, sulfuric acid and other hazardous material associated with plant operation. It is expected that there will be two truck deliveries per day to the operating facility. This would result in four truck trips per day. It is assumed that the truck routes would travel to the plant site by way of I-10 exiting at Mountain View Avenue. The trucks would then travel north on Mountain View Avenue to the plant site. The additional truck trips along with the vehicle trips associated with operational personnel would not change the LOS for Mountain View Avenue.

The MVPC has indicated that deliveries of hazardous material would occur over pre-arranged routes in compliance with applicable LORS (AFC, Page 6.5-25). The Mountain View Avenue access route is a two lane undivided highway. The roadway has no physical obstructions or sharp curves between the site and Lugonia Avenue to the south. There is an active at grade rail crossing located immediately south of Lugonia Avenue and to the north of the I-10 interchange on Mountain View Avenue. The rail line is owned by Metrolink but no passenger trains currently use this line. The BN & SF railway continues to operate freight trains through the Mountain View

Avenue crossing servicing industrial areas located in the City of Redlands and points east. Freight activity is low on this route averaging one train per weekday. Metrolink may extend passenger service into the City of Redlands on this route at some time in the future however there are no plans to do so in the near future. Therefore, traffic impacts associated with truck deliveries of operating supplies should not be significant.

## **AIRPORT TRAFFIC**

Operation of the San Bernardino International Airport could be affected by the construction of the proposed exhaust stacks associated with the expansion of the MVPC. The Federal Aviation Administration (FAA) in Title 14, Code of Federal regulations, Sections 77.21, 77.23, and 77.25 established standards for determining obstructions in navigable airspace. MVPC has submitted a Notice of Proposed Construction or Alteration to the FAA. MVPC will receive a determination from the FAA on the affects that the proposed project could have on navigable airspace. The FAA may require MVPC to have special lighting and marking on its stacks to insure air safety.

Other potential concerns related to the operation of the project that may affect navigable airspace include plant-generated plumes and turbulence from exhaust stacks and the power plant itself. Flashing lights other than FAA approved signal lights, reflected sunlight, surface water that could attract large concentrations of birds and potential electrical interference are additional areas that should be addressed in the FAA determination. Energy Commission staff will provide an analysis of these potential impacts on air traffic in the Final Staff Assessment.

## **LINEAR FACILITIES**

Potentially affected roadways are those adjacent to or crossed by the proposed project linear components (i.e., transmission line, natural gas pipeline, and water supply and wastewater pipelines). **TRAFFIC AND TRANSPORTATION Figure 2** illustrates the gas and water pipeline facility routes.

## **CONSTRUCTION PHASE**

### **TRANSMISSION LINE**

The transmission lines associated with the power plant will not cross any roadways in order to connect with the SCE substation. Therefore the only traffic impact associated with its construction will be the commuting of construction workers and the delivery of supplies and equipment during construction.

### **WATER SUPPLY LINE**

Cooling water for the power plant is proposed from three sources: the present supplier, Gage Canal Water Company; the drilling of two water-supply wells on site; and wastewater from the City of Redlands.

The wastewater supply will be delivered to MVPC through a new 2.3-mile pipeline. This pipeline will be laid alongside an existing sewage line within existing street

rights-of-way from the City of Redlands to the plant site. The route for the proposed pipeline will be from the City of Redlands wastewater treatment plant south on Nevada Avenue for approximately 0.9 miles, then west on San Bernardino Avenue for approximately 1.4 miles to the power plant site. The construction of the water supply line will result in the partial closure of the roadways. This will result in reduced traffic capacity during construction.

Nevada Street north of San Bernardino Avenue is a narrow road without centerline striping separating the two directions of traffic. It may be difficult to maintain 20 feet of pavement during construction. If 20 feet of traffic can not be maintained then one direction of traffic would need to be closed and flagger traffic control operation put in place. The section of Nevada Street to be impacted is approximately one mile in length and there is minimal traffic since it provides access to tree farms and the Redlands wastewater treatment plant. Mitigation measures can be put in place to ensure continuity of traffic flow, see the section for traffic mitigation. If this is done then there should be no significant impact on traffic during the construction phase.

San Bernardino Avenue between Mountain View Avenue and Nevada carries approximately 4,000 daily vehicles and operates at LOS A during both the AM and PM peak hours. A traffic control plan will have to be developed to minimize the impact of pipeline construction.

### ***Natural Gas Supply Line***

The major impact on traffic and transportation will be associated with the natural gas supply line during its construction. The natural gas supply will require the construction of a pipeline that is 17 miles along city streets. This construction will require partial closure of some roadways, which will reduce traffic capacity.

The pipeline construction will require approximately four months starting one month after plant construction commences (AFC 2-72, Figure 2.15-1). The line originates from the Southern California Gas Company gas line number 4000/4002 located on the west edge of the City of Rancho Cucamonga near Etiwanda Avenue. **TRAFFIC AND TRANSPORTATION Table 5, Natural Gas Pipeline Route** shows the 17-mile pipeline route, the affected streets and jurisdictions. The pipeline will be laid within city streets and there will be no aboveground pipeline features along the route except for two small sections. The pipeline will be hung from the bridge crossing the Santa Ana River at Tippecanoe Avenue. The other location is that the pipeline may be hung from another bridge crossing over the railroad tracks on Mill Street between Pennsylvania Avenue and Mount Vernon Avenue. The streets where the pipeline will be laid run almost entirely through fully developed residential, industrial and commercial areas.

The pipeline construction will require partial closure of the roadways shown in **Table 5**. It is not certain whether the construction will occur near the shoulder or in the middle of the roadway. For four-lane roadways it is assumed that one lane would be closed during pipeline construction. This would represent a worst case and result in a reduction of 50 percent of the roadway peak hour, peak direction carrying capacity (CMP 1999 Update, Appendix A, Table A-2). For two lane roadways both

directions of travel must be maintained. It is assumed that the peak hour, peak direction carrying capacity would be reduced by 20 percent on these roadways.

**TRAFFIC AND TRANSPORTATION TABLE 5**  
**Natural Gas Pipeline Route**

<b>Jurisdiction</b>	<b>Street Segment</b>	<b>Between</b>	<b>Miles</b>
Rancho Cucamonga	Arrow Route Highway	Etiwande Ave. and Cherry Ave.	2.0
San Bernardino Co.	Cherry Avenue	Arrow Route Highway and Merrill Ave.	0.5
Fontana/Rialto San Bernardino Co.	Merrill Avenue	Cherry Ave. and Eucalyptus Ave.	7.5
Colton/San Bernardino City	Mills Avenue	Eucalyptus Ave. and Tippecanoe Ave	5.5
San Bernardino City	Tippecanoe Avenue	Merrill Ave. and San Bernardino Ave.	1.0
San Bernardino City Redlands	San Bernardino Avenue	Tippecanoe and east of Mountain View Ave. to the plant site	0.5

**TRAFFIC AND TRANSPORTATION Table 6, Natural Gas Pipeline Route Construction Impacts** shows the potential affect of pipeline construction activities on street segment peak hour levels of service. Of the 17 segments of the natural gas pipeline route identified, a total of seven segments would be expected to experience unacceptable peak hour LOS F conditions on an intermittent basis during the four-month construction period. During construction, without any mitigating measures, all but four segments of the pipeline route will experience a decrease in LOS of at least one letter grade.

The following street segments will operate at or above their designed capacity during pipeline construction: Arrow Route between Etiwanda Avenue and Cherry Avenue, and Mill street between Rancho Avenue and Mt. Vernon. These sections are presently operating at a LOS of F. The streets along the pipeline route that would see their level of service drop to a LOS of E or F during construction are Mill Street between Mt. Vernon and "E" Street, Tippecanoe Avenue between San Bernardino Avenue and Mill Street, and San Bernardino Avenue between Tippecanoe and Mountain View Avenue.

#### **WASTEWATER DISCHARGE LINE**

The wastewater supply would be delivered to MVPC through a new 2.3 miles pipeline. The pipeline would be laid alongside an existing sewage line within existing street rights-of-way. The wastewater line would originate at the City of Redlands Wastewater Treatment Plant. It would go south along Nevada Avenue for 0.9 miles. The line would then turn west on San Bernardino Avenue for approximately 1.4 miles to the plant site. Both Nevada and San Bernardino Avenues have minimal traffic in this area, therefore if MVPC follows the proposed mitigation measures traffic impacts associated with construction of the pipeline should not be insignificant.

### TRAFFIC AND TRANSPORTATION TABLE 6 Natural Gas Pipeline Route Construction Impacts

IMPACTED ROADWAY SEGMENTS		Median	No. of Lanes	Existing ADT	AM Peak Hour	Existing AM LOS	Pipeline AM LOS	PM Peak Hour	Existing PM LOS	Pipeline PM LOS
On	Between									
Arrow Route	Etiwanda & Cherry	Undivided	2	13,000	1,100	D	F	1,370	F	F
Cherry	Arrow & Merrill	Divided	4	19,000	1,620	B	F	2,000	B	F
Merrill	Cherry & Beech	Undivided	2	8,000	480	B	B	810	C	D
Merrill	Beech & Citrus	Undivided	4	9,000	550	B	B	900	B	B
Merrill	Citrus & Sierra	Undivided	4	14,000	1,190	B	C	1,470	B	D
Merrill	Sierra & Alder	Undivided	4	13,000	1,110	B	C	1,370	B	D
Merrill	Alder & Cedar	Undivided	4	8,000	450	B	B	800	B	B
Merrill	Cedar & Riverside	Undivided	2	7,000	600	B	C	740	B	C
Merrill/Mill	Riverside & Pepper	Undivided	4	15,000	1,280	B	C	1,580	B	F
Mill	Pepper & Rancho	Divided	4	11,000	940	B	B	1,160	B	C
Mill	Rancho & Mt. Vernon	Undivided	2	14,000	1,190	E	F	1,470	F	F
Mill	Mt. Vernon & "E" St.	Divided	4	24,000	2,040	B	F	2,520	C	F
Mill	"E" St & Waterman	Divided	4	14,000	1,190	B	C	1,470	B	E
Mill	Waterman & Tippecanoe	Divided	4	7,000	600	B	B	740	B	B
Tippecanoe	San Bernardino & Mill	Divided	4	22,000	1,870	B	F	2,310	C	F
San Bernardino	Tippecanoe & Mountain View	Undivided	2	10,000	850	C	D	1,050	D	F
San Bernardino	Mountain View & California	Undivided	2	3,000	360	B	B	300	B	B

Source: CMP San Bernardino County, 1999 Update (Appendix A, Table A-2).  
MVPC 2000, AFC Table 6.5-1, Page 6.5-5

## **ACCESS ROAD**

Access to the plant will be through two entrances. These entrances are located off of Mountain View Avenue and San Bernardino Avenue. The plant entrances will be directly off of these streets; therefore no access road will need to be constructed. No road closure will be required. Traffic impacts associated with construction of plant access will be insignificant.

## ***Operation Phase***

The natural gas and water supply pipeline routes for the MVPC are located in rights-of-way along city streets in the vicinity of the project. Traffic associated with operation of these pipelines will be limited to occasional preventive maintenance or repair. No operation impact related to the proposed pipelines should be encountered. Therefore traffic impacts associated with the operation of the pipeline is considered to be insignificant.

## **CUMULATIVE IMPACTS**

The MVPC contacted the County of San Bernardino and the cities of Redlands and San Bernardino to determine whether projects in the vicinity of the power plant site have the potential to interact and create cumulative impacts (AFC Pg. 6.5-26). The following criteria were used to identify other projects that could contribute to a cumulative impact: where an application has been submitted to a local jurisdiction for required approvals and permits, and/or those have been previously approved and may be implemented in the near future. The County and Cities have a number of proposed and ongoing projects. However, none of these projects would contribute to a significant cumulative impact on traffic and transportation in the immediate vicinity of the proposed project because the other projects would not require construction access by the same roadways as the power plant site.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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### **FEDERAL**

MVPC has stated its intention to comply with all federal LORS. Staff has proposed a condition of certification to ensure compliance. Staff believes such compliance will not present any unusual difficulties. The project will be consistent with identified federal LORS.

### **STATE**

MVPC has stated its intention to comply with all state LORS. Staff has proposed a condition of certification to ensure compliance. Staff believes such compliance will not present any unusual difficulties. The project will be consistent with identified state LORS.

## **LOCAL**

During peak months of construction activity, worker trip reduction measures should be employed and staff has proposed a condition to ensure this. During the period of gas pipeline construction within street rights-of-way, measures should be taken to lessen potential impacts and extended vehicle delays. Staff has included a condition of certification which will address these impacts.

## **FACILITY CLOSURE**

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### **INTRODUCTION**

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

### **PLANNED CLOSURE**

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. To insure that the planned closure will be completed in a manner that complies with all LORS the applicant will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

### **UNEXPECTED TEMPORARY CLOSURE**

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as:

- Disruptions in the natural gas supply.
- Damage to the plant from earthquake, fire, storm or other natural disasters.
- The owner decision not to operate the facility for a period of time due to economic or other reasons.

From the perspective of traffic and transportation issues, in the event of temporary facility closure, the applicant would have to comply with all applicable policies contained in the LORS section of this report with respect to transportation permits for hazardous materials and equipment deliveries and removal.

### **UNEXPECTED PERMANENT CLOSURE**

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. Staff assumes that the facility will either remain idle until such time that

new ownership is established, or dismantling of the facility will occur. In any event, the owner will have to secure applicable transportation permits to satisfy the LORS requirements as stated in this report.

In the event of temporary closure, the effects on traffic and transportation would be similar to those for normal operation of the power plant facility. In the event of permanent closure, the effects would be similar to those associated with project construction. Permanent closure will involve a peak work period with commute traffic. In either instance, the roadway systems within the vicinity of the project should be able to handle traffic without significantly affecting the current level of service of the area.

## MITIGATION

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The applicant has indicated its intention to comply with all LORS relating to: 1) the transport of oversized loads, 2) the transport of hazardous materials, 3) implementation of Traffic Control Programs (TCP) for various roadways when construction impedes the flow of traffic, and 4) the acquisition of permits for pipelines that will encroach on public rights-of-way. The applicant will implement some or all of the following measures to insure that the LOS for the roadways impacted operate at the highest level possible.

1. Provide Omintrans information a minimum of seven days in advance regarding location and duration of construction and any bus stops impacted by traffic control plans.
2. Provide a TCP for the entire length of roadways where pipelines are to be constructed.
3. Install a temporary all-way stop or other appropriate measures at Cherry Avenue and Merrill Avenue during the period when construction is underway at this location.
4. For pipeline construction along Arrow Route between Etiwanda Avenue and Cherry Avenue, Cherry Avenue between Arrow Route and Merrill Avenue, Merrill Avenue/Mill Street between Riverside and Pepper Avenue, Mill Street between Rancho Avenue and Mt. Vernon Avenue, Mill Street between Mt. Vernon Avenue and E Street, Tippecanoe Avenue between Mill Street and San Bernardino Avenue, and San Bernardino Avenue between Tippecanoe Avenue and Mountain View Avenue, construction may be restricted to non peak periods (9:00 a.m. to 4:00 p.m. and 6:00 p.m. to 7:00 a.m.) to reduce the impact. Advance warning signs and detour signs will also be incorporated in the TCP on these segments to encourage drivers to use alternative routes such as Rialto Avenue and Foothill Boulevard.
5. At locations where a minimum of 20 feet of pavement for two-way traffic cannot be maintained during construction on any roadway segment, a one-way operation with flagger traffic control will be provided.

6. The TCP will minimize the total length of roadway under construction at any one time to avoid having long stretches of roadway out of service when construction is not occurring in that location.
7. A Traffic Management Program will be developed to ensure that the project traffic (including truck traffic with passenger car equivalent of three) plus existing traffic on the segment of Mountain View Avenue north of I-10 shall not exceed 700 passenger vehicles during any given hour of the day. To achieve this goal, one or more of the following measures may be used:
  - Encourage employees to carpool to work.
  - Development additional vanpooling or other ridesharing programs.
  - Request workers to use other access roads than Mountain View Avenue.
  - Stagger the arrival and departure time of the construction workers,

## **STAFF'S PROPOSED MITIGATION**

Staff proposes mitigation measures to address the repair of roadway pavement due to truck traffic impacts during construction, and implementation of a traffic control plan.

## **CONCLUSIONS AND RECOMMENDATIONS**

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The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases causing the LOS for various roadways to increase beyond LOS thresholds established by local and regional authorities.

During the construction phase, increased commuter traffic caused by the workforce could result in some traffic congestion. MVPC has proposed ways to reduce traffic impacts. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate substances.

Construction of the transmission lines will have minimal impacts on the function of area roadways. Routine construction safety measures should be sufficient to ensure no impacts. The natural gas pipeline and water supply line construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. Although, these impacts are expected to be short-term they could be significant traffic and transportation impacts. MVPC has indicated their intent to provide appropriate traffic control measures, and these are contained within the proposed conditions of certification. In addition, all development will take place in compliance with city, county and state LORS.

Based on staff's conclusions, if the proposed mitigation measures are properly implemented, no significant traffic impact are likely to occur. Further, if the

conditions of certification proposed by staff are observed and properly implemented, the MVPC will be in compliance with applicable laws, ordinances, regulations, and standards.

## CONDITIONS OF CERTIFICATION

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**TRANS-1** The project owner shall comply with Caltrans and San Bernardino County limitations on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

**Verification:** In the Monthly Compliance Reports, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

**TRANS-2** The project owner or its contractor shall comply with Caltrans, San Bernardino County and affected municipality limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from all relevant jurisdictions.

**Verification:** In Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

**TRANS-3** The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

**Verification:** The project owner shall include in its Monthly Compliance Reports, copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances. The project owner shall maintain copies of these permits at the project site for inspection by the CPM.

**TRANS-4** Prior to earth moving or ground disturbance activity for development of the MVPC, the project owner shall consult with San Bernardino County and affected municipalities, and prepare and submit to the CPM for approval a construction traffic control plan and implementation program which addresses the following issues:

- Use of carpools, vanpooling or other ride share programs;
- Timing of heavy equipment and building materials deliveries;
- Lane closures during construction
- Signing, lighting, and traffic control device placement if required;

- When construction work hours need to be established outside of peak traffic periods;
- Insure that construction doesn't interfere with emergency access to the construction sites;
- Redirecting construction traffic with a flagperson;
- Insure that adequate construction worker parking is provided on site.

**Verification:** At least thirty (30) days prior to earth moving or ground disturbance activity, the project owner shall provide to the CPM for review and approval, a copy of its construction traffic control plan and implementation program.

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# NOISE

Thomas M. Murphy

## INTRODUCTION

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The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the facility to any sensitive receptors combine to determine whether the facility will meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify and examine the likely noise impacts from the proposed Mountainview Power Plant (MVPP), and to recommend procedures to ensure that the resulting noise impacts will comply with applicable laws and ordinances, and will be adequately mitigated. This will enable the Energy Commission to make findings that:

- the MVPP will likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards (LORS); and
- the MVPP will present no significant adverse noise impacts, or none that have not been mitigated to the extent feasible.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed (see **Noise: Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed; assuring that workers are made aware of overexposure to noise; and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing offsite (community) noise.

### STATE

California Government Code Section 65302(f) requires that a noise element be prepared as part of the General Plan to address foreseeable noise problems. In addition, Title 4, California Code of Regulations has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in Table 1.

**Table 1 Land Use Compatibility for Community Noise Environment**

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE - Ldn or CNEL (db)						
	50	55	60	65	70	75	80
Residential – Low Density Single Family, Duplex, Mobile Home							
Residential - Multi-Family							
Transient Lodging – Motel/ Hotel							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditorium, Concert Hall, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business, Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							
<b>Normally Acceptable</b>	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.						
<b>Conditionally Acceptable</b>	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.						
<b>Normally Unacceptable</b>	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.						
<b>Clearly Unacceptable</b>	New construction or development generally should not be undertaken.						

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

Other State LORS include the California Environmental Quality Act (CEQA) and California Occupational Safety and Health Administration (Cal-OSHA) regulations.

## **CALIFORNIA ENVIRONMENTAL QUALITY ACT**

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq., Appendix G, § XI) explain that a significant effect from noise may exist if a project would result in:

- “a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels.
- c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project....”

## **CAL-OSHA**

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

## **LOCAL**

Although the MVPP site is located in an unincorporated area of San Bernardino County, the Cities of San Bernardino and Redlands are nearby. In addition to the power plant, the construction of a 24-inch gas pipeline will affect the Cities of Colton, Fontana, Rancho Cucamonga and Rialto. Therefore, noise LORS will be addressed for San Bernardino County and the aforementioned municipalities.

### **COUNTY OF SAN BERNARDINO**

Section 87.0905 of the San Bernardino County Development Code limits the Leq nighttime (10:00 p.m. to 7:00 a.m.) noise levels for Residential, Professional Services, Other Commercial, and Industrial at 49 dBA<sup>1</sup>, 55 dBA, 60 dBA, and 70 dBA, respectively. Respective daytime (7 a.m. to 10 p.m.) Leq noise levels are limited to 55 dBA, 55 dBA, 60 dBA, and 70 dBA, respectively. Temporary construction related activities are exempt from the aforementioned noise level limits between the hours of 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays (MVPC 2000a, § 6.4.2.3).

### **CITY OF SAN BERNARDINO**

Chapter 8.54, Section 8.54.020 of the City's Noise Ordinance specifies residential exterior and interior noise levels at 65 dBA and 45 dBA, respectively. Construction activities between 10:00 p.m. and 7:00 a.m. require approval from the mayor and Common Council (MVPC 2000a, § 6.4.2.3).

### **CITY OF REDLANDS**

The Noise Element of the City of Redlands General Plan specifies standards for exterior and interior residential noise levels at 60 dBA (CNEL) and 45 dBA (CNEL), respectively. Noise levels generated above these levels require mitigation

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<sup>1</sup> San Bernardino County's nighttime noise ordinance for residential land uses is 45 dBA Leq. However, if the measured ambient noise level exceeds any of the noise limit categories, the allowable noise exposure standard shall be increased to reflect the said ambient noise level. The lowest noise level measured at the nearest residence west of the MVPC plant was 49 dBA. As a result, the allowable noise exposure was increased from 45 dBA to 49 dBA.

measures in order to comply with the aforementioned standards (MVPC 2000a, § 6.4.2.3).

### ***CITY OF COLTON***

Chapter 5.0 of the Noise Element within the City of Colton General Plan establishes exterior night and day noise levels for commercial land uses at 55 dBA and 65 dBA, respectively (MVPC 2000a, § 6.4.2.3).

### ***CITY OF RANCHO CUCAMONGA***

Section 17.02.120, Noise Abatement under Title 17 of the Development Code, designates the exterior noise standard as 65 dBA. The City has adjusted noise levels for shorter periods of time and they include: 1.) the noise standard for a cumulative period of not more than 15 minutes in any one hour period; 2.) the noise standard plus 5 dBA for not more than 10 minutes in any one hour; 3.) the noise standard plus 14 dBA for not more than 5 minutes in any one hour; 4.) or the noise standard plus 15 dBA at any time (short duration).

Noise sources or vibrations related to construction, grading etc. are exempt from the aforementioned provisions if those activities adhere to the following specifications: 1.) cease during the hours of 8:00 p.m. and 6:30 a.m. Monday through Saturday, and any time on a Sunday or national holiday, and 2.) do not exceed the noise standard of 65 dBA plus the aforementioned provisions (Rancho Cucamonga 2000).

### ***CITY OF RIALTO***

The Noise Element of the City of Rialto General Plan establishes standards for various land uses including Residential, Institutional, Open Space, and Commercial/Industrial. All of the aforementioned land uses have exterior noise levels at 65 dBA CNEL with the exception of Residential, which has an exterior noise level of 60 dBA CNEL. The interior noise level is 45 dBA CNEL for residential and institutional land uses and 45-55 dBA CNEL for Commercial/Industrial land uses (MVPC 2000a, § 6.4.2.3).

### ***CITY OF FONTANA***

The Noise Element of the City of Fontana General Plan establishes noise standards associated with stationary noise sources. The exterior and interior noise standards for Residential, Institutional, Open Space, Commercial and Industrial should not exceed 65 dBA (except those areas under commercial/industrial affected by aircraft noise) and 45 dBA, respectively. Section 18-63 (14) of the Fontana City Code restricts the operation of construction equipment between the hours of 10:00 p.m. and 7 a.m. (City of Fontana, 1990).

## SETTING

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### PROJECT BACKGROUND

The MVPP involves the construction and operation of two new natural gas-fired, combined cycle power stations totaling 1,055.9 MW. The new power plant facilities, along with existing ones, will be contained within a 35-acre parcel. Each of the two proposed plants is conceptualized as two GE 7FA gas turbine generators, two Heat Recovery Steam Generators (HRSGs), and a single condensing Steam Turbine Generator (STG) (MVPC 2000a, § 2.2).

The Applicant also proposes the construction of a 17-mile natural gas pipeline supplied by the Southern California Gas Company (SCG). The line will connect with an existing SCG line within the City of Rancho Cucamonga. In addition to the natural gas pipeline, the Applicant proposes to interconnect a transmission line between the MVPP and the Southern California Edison Company (SCE) system. This interconnection involves the relocation of a 66 kV line within the property boundaries and the routing of 230 kV lines to an existing switchyard. Water supply and use will consist of onsite sources/facilities as well as offsite sources such as the Gage Canal well and/or well water and secondary effluent from the City of Redlands WWTP. The secondary effluent line will consist of a 2.3-mile new water supply pipeline (12 to 16 inch in diameter) between the City of Redlands WWTP and the MVPP facility (MVPC 2000a, § 2.8.1, 2.8.1.1, 2.11, 2.14, 2.14.1).

### EXISTING LAND USE

The MVPP site would be located within a currently unincorporated area of San Bernardino County bordered by the Santa Ana River to the north; City of Redlands and unincorporated San Bernardino County to the east; City of San Bernardino to the west; and Cities of Redlands and Loma Linda to the south. The existing MVPP site is zoned for industrial use. The proposed 12- to 16-inch water pipeline would be located within agricultural, light industrial, and commercial lands. The proposed 24-inch gas pipeline passes through the following existing land uses: residential, industrial, light industrial, commercial, agriculture, and vacant land (MVPC 2000a, § 6.3.1, Figures 6.3-1a through 6.3-1c).

The County of San Bernardino currently regulates land use planning for the MVPP site. However, the site is in the process of being annexed by the City of Redlands; annexation is expected to be completed on October 17, 2000. The City of Redlands General Plan designates the MVPP site as Industrial. Until and if an annexation occurs, the project will remain under the current County land use designation.

### COUNTY ZONING AND GENERAL PLAN DESIGNATION

The MVPP site, zoned for Regional Industrial, is authorized under the San Bernardino County General Plan land use designation as Regional Industrial (IR).

The natural gas pipeline and water supply line routes are zoned as the following: Single Family Residential (RS), General Commercial (CG), Multi-Family Residential

(RM), Community Industrial (IC), Regional Industrial (IR), Planned Development (PD), and Neighborhood Commercial (CN) (MVPC 2000a, § Table 6.3-3).

### **CITY ZONING AND GENERAL PLAN DESIGNATION**

The MVPP site is in the process of being annexed by the City of Redlands. The natural gas pipeline would be constructed through the Cities of Colton, Fontana, Redlands, Rialto, and San Bernardino. The City of Redlands, having approved the pre-zoning of the site as General Industrial (M-2), designates the site as Industrial in the General Plan. MVPC is currently negotiating with SCE to purchase an additional 3-acre parcel. The total proposed site would be 38 acres.

### **SENSITIVE RECEPTORS**

Residential receptors will be affected by the proposed MVPC power plant and linear facilities. Residential receptors affected by the power plant site are located to the southwest in the City of San Bernardino and southeast in the City of Redlands. The closest sensitive receptor is located approximately 200 feet southwest of the facility boundary and 1,200 feet from the closest proposed power generating equipment (MVPC, 2000II, AFC Data Response 154). Residential receptors exist within 0.5 mile of the natural gas pipeline route in the following locations: on the south side of Arrow Route Highway in the City of Rancho Cucamonga; the north and south sides of Arrow Route Highway and Merrill Avenue, in a portion of San Bernardino County and the Cities of Rialto and Fontana; north and south of Mill Street in the Cities of Colton and San Bernardino; east and west of Tippecanoe Avenue; and north and south of San Bernardino Avenue in the Cities of San Bernardino and Redlands.

Sensitive receptors within 0.5-mile of the proposed natural gas pipeline are located in the Cities of Colton, Fontana, Rialto, and San Bernardino, as well as the County of San Bernardino. Table 6.3-2 lists 26 sensitive receptors along the natural gas pipeline route. Refer to Table 6.3-2 and Figures 6.3-2a through 6.3-2c in the AFC for the locations of the subject receptors.

### **EXISTING NOISE LEVELS**

In order to predict the likely noise effects of the MVPP on the sensitive receptors, the Applicant commissioned an ambient noise survey of the area. The survey was performed using Larson Davis model 870 sound level meters, which recorded  $L_{eq}$ ,  $L_{10}$ ,  $L_{50}$ , and  $L_{90}$  noise measurements. The first survey was performed without the existing power plant in operation. The Applicant conducted both long-term (25-hour period) and short-term (15 to 25 minute survey period) noise measurements (MVPC 2000a, § 6.4.1.2).

The Applicant's noise survey monitored 25-hour levels at the property line of residences located at the northwest corner of Mountain View Avenue and San Bernardino Avenue. These residential receptors are approximately 200 feet from the facility boundary. The hourly measurements were recorded from 11:11 a.m. on May 24, 1999 until 12:12 p.m. on May 25, 1999. Survey results indicated that the  $L_{eq}$  noise levels were 49 dBA during the nighttime hours and 57 dBA during morning and peak afternoon hours. The  $L_{10}$  noise levels were between 50 dBA and 59 dBA. The  $L_{50}$  levels were recorded between 47 dBA and 55 dBA.  $L_{90}$  noise

measurements ranged between 45 dBA and 53 dBA (MVPC 2000a, AFC § 6.4.1.2, Table 6.4-1).

Short duration noise measurements were conducted at other sensitive receptors near the proposed power plant site and along the proposed waterline and natural gas pipeline routes. The noise measurements, which ranged from 15-25 minutes, were recorded at eleven locations on May 24, 1999 and May 25, 1999. The receptors along Mill Street consisted of religious, educational and residential types. The  $L_{eq}$  noise levels ranged from 57 dBA to 69 dBA. Mountain View Avenue monitoring locations consisted of two (2) residential receptors with  $L_{eq}$  noise levels at 58 dBA. The two remaining residential receptors, one located at Wallace Court, and the other on Lugonia Avenue, recorded  $L_{eq}$  noise levels at 52 dBA for both receptors. A golf course, which is located at Central Avenue, had an  $L_{eq}$  noise level at 60 dBA. The noise level at an orchard located off of California Street was 52 dBA. Noise levels in the aforementioned locations can be attributed to heavy traffic volume and industrial operations (MVPC 2000a, Table 6.4-2).

The second noise level survey was conducted on June 30, 1999 at the closest residential property lines and at a location 200 feet from the existing power plant equipment. The noise levels were surveyed during existing power plant operations.

Existing power plant noise levels at the closest residential receptor along Mountain View Avenue were 54 dBA  $L_{90}$  when the power plant was at 98% load, and 53 dBA  $L_{90}$  at 44% load.

Short duration noise measurements were recorded at a location 200 feet east of the existing power plant equipment (within the MVPP site).  $L_{eq}$  noise levels at the aforementioned location ranged between 73 and 76 dBA. The measurements were taken 10 to 15 minutes in length between the hours of 10 a.m. and 4 p.m. (MVPC 2000II, Data Response 156).

## **IMPACTS**

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Project noise impacts can be created by construction, and by normal operation of the power plant.

### **PROJECT SPECIFIC IMPACTS — CONSTRUCTION**

#### ***COMMUNITY EFFECTS***

Construction noise is a temporary phenomenon; the construction period for the MVPP facility is scheduled to last approximately 19 months (MVPC 2000a, AFC Figure 2.15-1). Construction of an industrial facility such as a power plant is typically and unavoidably noisier than what is usually permissible under noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances. Refer to the aforementioned section on LORS affiliated with San Bernardino County and respective municipalities.

The Applicant has predicted the noise impacts of the project construction on the closest sensitive receptor, which is approximately 300 to 500 feet from the proposed construction activity. However, construction activity at this location will be minimal whereas most construction activity will occur more than 500 feet from the nearest residential receptors. Because of the natural attenuation provided by existing facility structures and a six-foot high berm, sound levels should drop 5 dBA. Therefore, it is anticipated that sound levels at the nearest residential receptors should be below 60 dBA (MVPC 2000k, Data Response 57). Noise effects from construction would further be reduced through the implementation of Conditions of Certification **NOISE-1** and **NOISE-2**.

## **STEAM BLOWS**

Typically, the steam blows create the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine. After erection and assembly of the feedwater 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 turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High pressure steam is then raised in the heat recovery steam generator (HRSG) or a temporary boiler 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 two or three 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 steam turbine, which is then ready for operation.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to approximately 103 dBA, an exceedingly disturbing level, at the nearest residence, 1,200 feet in distance (distance the receptor is from the center of the units). In order to minimize disturbance from steam blows, the steam blow piping can be equipped with exhaust silencers that will reduce noise levels by 20 dBA (or more), or to a level of 83 dBA at the nearest residence. This is still an annoying noise level; staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see proposed Condition of Certification **NOISE-4** below) in order to minimize annoyance to residents.

Other than the steam blow method, the Applicant is considering two alternative methods. These methods are air blow and hydro-blast cleaning. The air blow method utilizes a group of engine powered air compressors rather than gas turbine generators and HRSGs. The air compressors are located in sound attenuated enclosures and consist of short, periodic blows until the steam lines are clean. The hydro-blast cleaning method utilizes high pressure water via an electric pump. Neither the gas turbine generators nor HRSGs are used during this method. In

addition, the hydro-blast cleaning method does not discharge steam or air; therefore, no significant noise would be generated during this particular cleaning method (MVPC 2000k, Data Response 60).

Alternatively, the Applicant may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at the nearest residence would thus be 53 dBA, slightly higher than the background noise levels. Using this type of process would reduce the noise levels associated with steam blow operations to a less than significant level.

## **LINEAR FACILITIES**

Construction of the natural gas and water pipelines will produce noise. This noise will be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction area. This work, however, is only a temporary phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days. In addition, such work is customarily performed during the daytime, and would cause no impacts at night, when quiet is most important. However, due to traffic constraints, some pipeline construction may be required to occur at nighttime. The nighttime construction activities will need to comply with all applicable LORS. MVPC will communicate and coordinate with the local communities and agencies regarding the construction schedule, mitigations and any required permits needed to reduce noise level impacts (MVPC 2000a, § 6.4.3.1.2).

## ***WORKER EFFECTS***

The Applicant acknowledges the need to protect construction workers from noise hazards as well as the applicable LORS relating to worker health and safety. As per the California Occupational Safety and Health Administration regulations (Cal-OSHA), the maximum noise level over an 8-hour work period is 90 dBA. Areas above 85 dBA need to be posted as high noise level areas and appropriate hearing protection will be required. MVPC will also adopt a hearing conservation program in accordance with the Cal-OSHA §5097 Hearing Conservation Program. This section is located within Subchapter 7, General Industry Safety Orders, Group 15, Occupational Noise, Article 105.

With proper execution of the Hearing Conservation Program, as well as with the implementation of proposed Condition of Certification ~~NOISE-3~~, no occupational safety impacts are anticipated from occupational noise.

## **PROJECT SPECIFIC IMPACTS — OPERATION**

### ***COMMUNITY EFFECTS***

The Applicant proposes to incorporate noise mitigation measures into the design of the proposed project, such as: enclosing the Steam Turbine Generators in acoustical enclosures; installing inlet and exhaust mufflers on coolers; etc. These

measures will ensure that noise levels at the nearest residential receptors (Lugonia Avenue and Mountain View Avenue) will meet the exterior noise standards (60 CNEL) for the City of Redlands, as well as the County of San Bernardino's nighttime (10 p.m to 7 a.m.) ordinance of 49 dBA Leq (MVPC 2000a, § 6.4.3.2.1).

## **POWER PLANT OPERATION**

During its operating life, the MVPP will represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown, as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease.

The primary noise sources anticipated from the proposed facility include the heat recovery steam generators, the combustion turbine generator packages, the steam turbine generator, the cooling towers, boiler feed pumps, the generator step-up transformers, and the circulating water pumps. Secondary noise sources are anticipated to include auxiliary pumps, ventilation fans, motors, valves and compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The Energy Commission defines the area impacted by the proposed project as that area where there is a potential increase in existing noise levels of 5 dBA or more during operation of the project. Typically, the Energy Commission requires that the 5 dBA be compared against the lowest one-hour  $L_{90}$  value, which is usually during nighttime hours where sleep interference is a factor. However, the impact assessment for this project evaluated the power plant under two different operating scenarios: 1.) the incremental increase in noise levels with the existing (two 66 MW gas-fired power plants) and the new power plant operating at the same time; 2.) the incremental increase in noise levels from the operation of the new power plant only. The impact assessment methodology was developed because there is an existing "peaking" power plant at the site that operates intermittently based on the electricity market demand. During the summer, the existing plant generally runs seven days a week. Depending upon pricing and demand, the plant has often run at full load for as many as 20 + hours. However, at other times the power plant is not operational, especially in non-summer months.

Under scenario 1, staff evaluated whether the proposed power plant would add an additional 5 dBA increase in noise levels above what the existing power plant and other sources are producing in the area. Ambient noise levels for daytime (10 a.m. to 4 p.m.) hours were used in this analysis because that is the period of time when peak generation demand is generally required. According to Table 6.4-3 in the AFC, the  $L_{90}$  noise measurement at the nearest sensitive receptor during power plant operations was recorded at 54 dBA (MVPC 2000a, § 6.4.1.3). The measurement was taken on June 30, 1999 between 10 a.m. and 4 p.m. Because the existing noise level was measured at 54 dBA, the 48 dBA produced by the proposed project would not cause a substantial increase in existing noise levels at the nearest sensitive receptor (residential receptor along Mountain View Avenue).

In fact, it is anticipated that the addition of this steady-state noise level from the new power plant would not be audible to the closest receptor. The proposed Conditions of Certification **NOISE-6** would require the ambient daytime noise levels to be 59 dBA or less.

Under scenario 2, staff evaluated whether the proposed project would add an additional 5 dBA increase in noise levels above the existing ambient conditions when the existing power plant was not operational. The most likely time when the peaking power plant would not be operational is between 11 p.m. and 4 a.m. The existing  $L_{90}$  noise level between 11 p.m. and 4 a.m. without the operation of the existing power plant was measured at 47 dBA (MVPC 2000a, § 6.4.1.2). As described in Table 6.4-13 of the MVPC's AFC, the project would increase the existing noise level by 1 decibel above the existing noise level at the nearest sensitive receptor. This increased noise level would be considered less than significant because it would remain below the 5 dBA threshold (MVPC 2000a, § 6.4.1.2 Table 6.4-1). It should be noted that the proposed Condition of Certification **NOISE-6** would make sure that the ambient nighttime noise levels are 52 dBA  $L_{90}$  or less. Further, it should be noted that the County of San Bernardino's nighttime (10 p.m. to 7 a.m.) noise ordinance of 49 dBA Leq would restrict noise levels in the general vicinity of the power plant.

#### **TONAL AND INTERMITTENT NOISES**

One possible source of annoyance would be strong tonal noises, individual sounds that, while not louder than permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the MVPP can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out. Because the existing facility has units 1 and 2 in operation, impacts from the proposed units 3 and 4 would be considered insignificant. Another potentially annoying source of noise from a combined cycle power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed measures (see proposed Condition of Certification **NOISE-6**, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

#### **LINEAR FACILITIES**

The linear facilities for the MVPP project consist of a 17-mile natural gas pipeline that would be connected to the Southern California Gas Company (SCG) within the City of Rancho Cucamonga. In addition to the natural gas pipeline, a water supply and discharge line would be constructed to support the proposed facility. All three pipelines would be buried below ground and would not produce any audible noise. Thus, there will be no noise impacts associated with the pipelines.

In addition to the pipelines, the Applicant proposes to interconnect the transmission line between the MVPP and the Southern California Edison Company (SCE). This interconnection involves the relocation of a 66 kV line within the property boundaries and the routing of 230 kV lines to an existing switchyard. Noise sources

associated with power transmission include occasional breaker operations in the switchyard, corona noise and a very low magnetostriction hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration, and may occur only a very few times per year. Corona noise is characterized as a buzz or hum and is usually worse when the conductors are wet, such as in rain or fog. The switchyard exists; therefore, no additional audible noise impacts from linear facilities are expected for the proposed project.

## **WORKER EFFECTS**

The Applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and commits to comply with applicable LORS. A measure to be implemented for noise-related impacts includes a Hearing Conservation Program. With proper execution of the Hearing Conservation Program, as well as with the implementation of proposed Condition of Certification **NOISE-7**, no occupational safety impacts are anticipated from operational noise.

## **CUMULATIVE IMPACTS**

Section 15130 of the CEQA Guidelines requires a discussion of cumulative environmental impacts when they are evaluated as being significant. Cumulative impacts are defined as those impacts that are created because of the combination of the project evaluated in the EIR together with other projects causing related impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the proposed project alone.

The CEQA Guidelines also mandate two different ways in which cumulative impacts are to be evaluated. One of these mandated approaches is to summarize growth projections in an adopted General Plan or in a prior certified environmental document. The second method involves compilation of a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

Future development near the project site includes industrial, commercial, and residential properties. This development is associated with the East Valley Corridor Specific Plan (EVCSP), and is located immediately adjacent to the west and south of the power plant site. The EVCSP has formulated policies in an orderly and systematic approach to address noise impacts. The impacts from the proposed MVPP coupled with the EVCSP are not expected to be significant (MVPC 2000II, Data Response 155).

## **FACILITY CLOSURE**

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Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the MVPP, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment

properly equipped with mufflers. Any noise LORS then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

Staff concludes that the MVPP will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the MVPP, mitigated as described above, will likely present no significant adverse noise impacts. The MVPP will likely represent an unobtrusive, nearly undetectable component of ambient noise levels.

### **RECOMMENDATIONS**

Staff recommends that the following proposed Conditions of Certification be adopted to ensure compliance with all applicable noise LORS and implementation of the Applicant's proposed mitigation measures.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**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 or adjacent to the pipeline routes, 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. 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 posted at the project site during construction in a manner visible to passersby. 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 Energy Commission 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.

**NOISE-2** Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints.

The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (see Exhibit 1, below, for example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise related to the complaint;
- if the noise is project related, take all feasible measures to reduce the noise at its source; and
- submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

**Verification:** Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the San Bernardino County Land Use Services Department, and with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

**NOISE-3** Prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

**Verification:** At least 30 days prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

**NOISE-4** If a traditional, 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 110 dBA measured at a distance of 100 feet. 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 hours of execution, to the CPM.

**Verification:** At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the

temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

**NOISE-5** If high pressure steam blows are used, at least 15 days prior to the first steam blow(s), the project owner shall notify all residents or business owners within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

**Verification:** Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

**NOISE-6** Within 30 days of the project first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. 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 muffled to preclude noise that draws legitimate complaints. If the results from the survey indicate that the project noise levels at the closest sensitive receptor are in excess of 59 dBA L<sub>90</sub> during daytime hours (10 a.m. to 4 p.m.) and 52 dBA L<sub>90</sub> during nighttime hours (11 p.m. to 4 a.m.), additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

**Verification:** Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the San Bernardino County Land Use Services Department, and to the CPM. 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.

**NOISE-7** The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within 30 days after the facility is in full operation, and 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.

**Verification:** Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

**NOISE-8** Noisy construction work (that which causes offsite annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the times of day delineated below:

High-pressure steam blows:	8 a.m. to 5 p.m.
Other Noisy Work:	
(County of San Bernardino Development Code)	7 a.m. to 7 p.m.

**Verification:** The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

**EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM**

Mountainview Power Plant (00-AFC-2)		
<b>NOISE COMPLAINT LOG NUMBER</b> _____		
Complainant's name and address:  		
Phone number: _____		
Date complaint received: _____ Time complaint received: _____		
Nature of noise complaint:  		
Definition of problem after investigation by plant personnel:  		
Date complainant first contacted: _____		
Initial noise levels at 3 feet from noise source _____	dBA	Date: _____
Initial noise levels at complainant's property: _____	dBA	Date: _____
Final noise levels at 3 feet from noise source: _____	dBA	Date: _____
Final noise levels at complainant's property: _____	dBA	Date: _____
Description of corrective measures taken:  		
Complainant's signature: _____		Date: _____
Approximate installed cost of corrective measures: \$ _____		
Date installation completed: _____		
Date first letter sent to complainant: _____		(copy attached)
Date final letter sent to complainant: _____		(copy attached)
This information is certified to be correct:  		
Plant Manager's Signature: _____		

(Attach additional pages and supporting documentation, as required).

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## **NOISE: APPENDIX A**

### **FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE**

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. Table A1 provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period ( $L_{eq}$ ), or by day and night levels with a nighttime increase of 10 dBA ( $L_{dn}$ ). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45-to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. In wilderness areas, the  $L_{dn}$  noise levels average approximately 35 dBA, 50 dBA in small towns or wooded residential areas, 65 to 75 dBA in major metropolis downtown (e.g., Los Angeles), and 80 to 85 dBA near freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects (USEPA, 1971). At 70 dBA, sleep interference effects become considerable.

In order to help the reader understand the concept of noise in decibels (dBA), NOISE: Table A2 has been provided to illustrate common noises and their associated dBA levels.

<b>NOISE: Table A1</b> <b>Definition of Some Technical Terms Related to Noise</b>	
<b>Terms</b>	<b>Definitions</b>
Decibel, Db	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L10, L50, & L90	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L90 is generally taken as the background noise level.
Equivalent Noise Level $L_{eq}$	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, $L_{dn}$	The Average A-Weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Source: California Department of Health Services 1976.	

**NOISE: Table A2**  
**Typical Environmental and Industry Sound Levels**

Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')	90	Boiler Room	Very Loud
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	Quiet
Large Transformer (200')	40		
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
Source: Peterson and Gross 1974			

### ***Subjective Response to Noise***

The adverse effects of noise on people can be classified into three general categories:

Subjective effects of annoyance, nuisance, dissatisfaction.

Interference with activities such as speech, sleep, and learning.

Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations

of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

- Except under special conditions, a change in sound level of one dB cannot be perceived.
- Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
- A change in level of at least five dB is required before any noticeable change in community response would be expected.
- A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

### **Combination of Sound Levels**

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

<b>NOISE: Table A3</b> <b>Addition of Decibel Values</b>	
When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to $\pm 1$ dB.	

Source: Thumann, Table 2.3

### **Sound and Distance**

Doubling the distance from a noise source reduces the sound pressure level by 6 dB. Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

### **Worker Protection**

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

**NOISE: Table A4**  
**OSHA Worker Noise Exposure Standards**

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

# **VISUAL RESOURCES**

Michael Clayton, Eric Knight

## **SUMMARY**

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Energy Commission staff analyzed both the potential visual impacts of the proposed Mountainview Power Plant Project (MVPP) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project, as proposed, would have the potential to cause significant adverse visual impacts. However, it is expected that effective implementation of the applicant's proposed mitigation measures, as modified, expanded, and augmented by staff's recommendations, would reduce visual impacts to a level that is not significant. Staff also concludes that the proposed mitigation, as augmented by staff's recommendations, would bring the project into compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

## **INTRODUCTION**

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Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether MVPP would cause significant adverse visual impacts and whether the project would be in conformance with applicable laws, ordinances, regulations, and standards. The determination of the potential for significant impacts to visual resources resulting from the proposed project is required by the California Environmental Quality Act (CEQA) Public Resources Code section 21000 et seq. and Title 20, California Code of Regulations, section 1701 et seq.<sup>1</sup> The determination of the conformance of the proposed project with applicable laws, ordinances, regulations, and standards is required by Public Resources Code section 25525.

## **ORGANIZATION OF ANALYSIS**

This analysis is organized as follows:

- Description of analysis methodology;
- Description of applicable laws, ordinances, regulations and standards;
- Description of the project aspects that may have the potential for significant visual impacts;
- Assessment of the visual setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting;
- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;

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<sup>1</sup> The California Energy Commission's power plant siting regulations.

- Identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.
- Conclusions and Recommendations; and
- Proposed Conditions for Certification

## **ANALYSIS METHODOLOGY**

Visual resources analysis has an inherent subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

### **SIGNIFICANCE CRITERIA**

Commission staff considered the following criteria in determining whether a visual impact would be significant.

#### **STATE**

The CEQA Guidelines defines a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

- Would the project have a substantial adverse effect on a scenic vista?
- Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
- Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
- Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

#### **LOCAL**

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

### **PROFESSIONAL STANDARDS**

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon 1986). The questions listed below address issues commonly raised in visual

analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?
- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
- Will the project eliminate or block views of valuable visual resources?
- Will the project result in significant amounts of backscatter light into the nighttime sky?
- Will the project be in conflict with directly identified public preferences regarding visual resources?
- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?
- Will the project result in a substantial and persistent visible exhaust plume?

### ***VIEW AREAS AND KEY OBSERVATION POINTS***

The proposed project is visible from a number of areas. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points<sup>2</sup>, or KOPs, as locations in each of these areas for detailed analysis and photographs of the existing setting and visual simulations of the proposed project. KOPs are selected to be representative of the most critical locations from which the project will be seen. However, KOPs are not the only locations that staff considered in each view area.

### ***EVALUATION PROCESS***

For each viewing area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Energy Commission staff conducted a site visit and concluded that three of the four view areas and selected KOPs were appropriate for this analysis. However, staff requested that KOP 4 be revised to provide a southwesterly view of the site from the Santa Ana River Trail (SART) rather than the initial southeasterly view. Visual Analysis Data Sheets were prepared for each KOP and are presented in Appendix A.

### **ELEMENTS OF THE VISUAL SETTING**

To assess the existing visual setting, staff considered the following elements:

#### ***Visual Quality***

Visual quality is an expression of the overall visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This

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<sup>2</sup> The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as “picture postcard” landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

### ***Visual Absorption Capability***

A landscape’s ability to accept alteration without diminishment of visual quality or creation of visual contrast is often referred to as visual absorption capability. In the case of predominantly natural settings, the presence of forms, lines, colors, and textures similar to those of a proposed project would indicate a landscape more capable of accepting those project characteristics than a landscape where those elements were absent. Also, the presence of opportunities to screen the project from view, such as landforms, vegetation, or existing structures, would also improve a given landscape’s ability to absorb a project without noticeably diminishing visual quality or increasing visual contrast. The lower the rating for visual absorption capability, the more susceptible the landscape is to visual impacts. The higher the visual absorption capability the less vulnerable the landscape is to visual impacts.

### ***Viewer Sensitivity***

Viewer sensitivity is a measurement of the level of interest or concern of viewers regarding the visual resources in an area. Official statements of public values and goals reflect viewers’ expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer sensitivity. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to be highly sensitive. Travelers on other highways and roads, including those in agricultural areas, may be moderately sensitive depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate sensitivity, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high visual sensitivity. Industrial uses are typically the least sensitive because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

### ***Viewer Exposure***

The visibility of the landscape, the number of viewers, the duration of the view, and the viewing distance to the landscape feature affect the exposure of viewers to a given viewshed or landscape. Landscape visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from having high values for all factors, such as an unobstructed foreground view from a large number of residences, to having low values for all factors, such as a partially obscured and brief background view for a few motorists.

## ***Visual Impact Susceptibility***

The level of susceptibility of a view area to impacts due to visual change is a function of visual quality, viewer sensitivity, and viewer exposure and can range from low to high.

### **TYPES OF VISUAL CHANGE**

To assess the visual changes that the project would cause, staff considered the following factors:

#### ***Contrast***

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from high to low.

#### ***Dominance***

Another measure of visual change is *project dominance*. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

#### ***View Blockage***

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality features causes adverse impacts. The degree of view blockage can range from strong to none.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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### **FEDERAL AND STATE**

The proposed project, including the power plant and associated pipeline routes, are located on both private and non-federal public lands. Therefore, the project is not subject to federal land management requirements. Additionally, none of the major roadways in the project vicinity including Interstate 10 and Highway 30 are eligible or designated State Scenic Highways (MVPC 2000a, p. 6.6-7); State Scenic Highway System Web Site). Therefore, no federal or state regulations pertaining to scenic resources are applicable to the project.

### **LOCAL**

Portions of the proposed project would be located in several local jurisdictions as follows: County of San Bernardino (power plant), City of Colton (gas pipeline along Mill Street), City of Fontana (gas pipeline along Merrill Avenue), City of Rancho Cucamonga (gas pipeline along Arrow Route), City of Redlands (water supply line along San Bernardino Avenue and Nevada Street), City of Rialto (gas pipeline along

Merrill Avenue), and City of San Bernardino (gas pipeline along Mill Street and wastewater discharge line extension through the San Bernardino Public Golf Course).

## **SAN BERNARDINO COUNTY**

Table 1 identifies and discusses the San Bernardino LORS applicable to visual resources for the proposed project.

**Table 1**  
**San Bernardino County LORS Applicable to Visual Resources**

<b>LORS</b>	<b>Applicability</b>
General Plan Policy OR-50	Identifies any portion of the regional trail system as a potential scenic resource. The proposed SART is located adjacent and to the north of the power plant site. As a result, the SART will be in the County's scenic overlay district.
General Plan Policy OR-51	Development along a scenic corridor is required to demonstrate through visual analysis, that proposed improvements are compatible with the scenic qualities present.
General Plan Section II, C.4	Describes the County's policies, guidelines, and criteria for trails.
General Plan Section II, C.5	Describes the County's policies, guidelines, and criteria for open space, recreation, and scenic areas.
Development Code Section 81.030105	Provides Conditional Use Permit review criteria
Development Code Section 84.030601	Explains the intent of the Scenic Resources Overlay District (SROD) to protect, preserve, and enhance aesthetic resources.
Development Code Section 84.0410	Describes Additional Use criteria, which includes obtaining a Conditional Use Permit (CUP) and specifies criteria to be used for this CUP.
Development Code Section 84.0405	Provides an alternate review procedure for Use Permits in processes like the California Energy Commission project siting process where a state agency is the lead authority.
Development Code Section 85.030605	Explains where the SROD can be applied.
Development Code Section 85.030610	Establishes criteria to evaluate compliance of new projects within the Scenic Resources Overlay District. Includes criteria for building and structure placement, landscaping and grading.
Development Code Section 87.0401	Provides general requirements regarding height of structures.
Development Code Section 87.0405	Provides process for increasing permitted structure height.
Development Code Section 89.0101	Explains the purpose of Plant Protection and Management to include preserving aesthetic values of plant life.

Development Code Section 812.15020	Provides a definition of Open Space.
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## ***CITY OF REDLANDS***

If the power plant site is annexed to the City of Redlands, MVPC will consult with the City regarding development requirements and permits prior to submittal of development plans (MVPC 2000g, p. 6.6-9). Table 2 identifies and discusses the City of Redlands LORS that would be applicable to visual resources for the proposed project.

<b>Table 2 City of Redlands LORS Applicable to Visual Resources</b>	
<b>LORS</b>	<b>Applicability</b>
General Plan Section 3.0	Describes the City's plan to preserve its design and image including vegetation and architectural heritage.
General Plan Section 3.10	Provides design criteria for development in city zones
General Plan Section 3.21	Explains City policies regarding historic and scenic conservation areas.
General Plan Section 3.29	Explains City policies regarding agricultural and scenic areas.
General Plan Section 7.0	Describes City policies and plans regarding open space and conservation.
General Plan Section 7.10	Describes City policies and plans regarding parks and recreational open space
General Plan Section 7.11	Describes City policies and plans regarding trails.
Municipal Code Section 18.168	Describes City policy and regulatory purpose regarding landscaping, fences, walls, and signs.
Municipal Code Section 18.116.030	Provides building height limits including a provision for electric generating stations and accompanying structures.

## ***OTHER JURISDICTIONS***

Given the underground nature of the linear components no other jurisdictional LORS policies pertaining to visual or aesthetic resources would apply to the MVPP.

## **PROJECT DESCRIPTION**

The following section describes the aspects of the project that may have the potential for significant visual impacts. These facilities include the power plant, a natural gas supply pipeline, a water supply pipeline, a wastewater discharge pipeline, and construction laydown areas. There will be no new electric transmission lines required for the project.

## POWER PLANT

The proposed power plant site would be located at the existing Mountainview Power Plant Company gas-fired power plant (formerly known as the San Bernardino Generating Station). The proposed site is located north of San Bernardino Avenue and east of Mountain View Avenue in San Bernardino County. The existing plant site encompasses 16.3 acres. An additional 38 contiguous acres would be acquired. The site is slightly more than a mile north of Interstate 10 (see **PROJECT DESCRIPTION Figures 1 and 2**).

The most visually prominent elements of the power plant would be the 200-foot tall heat recovery steam generator (HRSG) exhaust stack structures, the four 81-foot tall HRSGs, the air filter elevated to 57 feet, and the 56-foot tall cooling towers (**PROJECT DESCRIPTION Figure 4**). As illustrated in the aerial view presented as **PROJECT DESCRIPTION Figure 3**, the unusual triangular forms and diagonal lines of the stack ducts enclosure substantially increases noticeability of the power plant.

## NATURAL GAS PIPELINE

**PROJECT DESCRIPTION Figure 5** shows the location of the proposed 24-inch natural gas supply line. The pipeline will be approximately 17 miles in length, extending from the SoCal Gas facility in the City of Rialto along city streets to the proposed power plant. The pipeline will pass through the cities of Colton, Fontana, Rancho Cucamonga, Rialto, and San Bernardino. While a maximum of two isolation valves would be installed along the pipeline route, the valves would be located underground.

## WATER SUPPLY PIPELINE

**PROJECT DESCRIPTION Figure 6** shows the location of the proposed 12- or 16-inch, 2.3-mile pipeline that would potentially convey secondary effluent from the Redlands Wastewater Treatment Plant. The pipeline would be located underground within San Bernardino Avenue and Nevada Street, east and south of the proposed plant site in the City of Redlands.

## WASTEWATER DISCHARGE PIPELINE

**PROJECT DESCRIPTION Figure 8** shows the location of the proposed 12-inch diameter, 1,100-foot long connector pipeline that would extend from the endpoint of the out-of-use water pipeline across Twin Creek Channel to the easternmost terminus of the existing Santa Ana Regional Interceptor (SARI) discharge line. The new connector would be underground except where it crosses the Twin Creek Channel. At that location, the pipeline would be suspended from an existing golf cart bridge, which is located in the San Bernardino Public Golf Course, in the City of San Bernardino (MVPC 2000a, p. 6.6-7).

## CONSTRUCTION LAYDOWN AREAS

**PROJECT DESCRIPTION Figure 8** shows the location of the construction laydown areas to be used for plant construction. One laydown area would be located in the

northeast corner of the project site and one laydown area would be located in the southeast corner of the site.

## SETTING

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### REGIONAL SETTING

The MVPP including the linear facilities would be located within the highly urbanized San Bernardino Valley. The Valley is bordered on the "...north by the San Gabriel and San Bernardino Mountains, on the east by the San Bernardino range trending southeast, on the south by the alluvial highlands extending south from the San Bernardino and Jurupa Mountains, and on the west by the communities of Chino, Puente, and San Jose Hills" (MVPC 2000a, p. 6.6-1). The surrounding mountains add visual variety to the flat urban landscape of the valley floor though they are frequently, partially obscured by poor visibility associated with poor air quality. The western portion of the Valley is highly urbanized while the eastern portion of the valley is rapidly transitioning from agricultural to urban uses. The project region encompasses primarily urban development and some vestiges of the native riparian woodlands and scrub habitats. Located immediately north and adjacent to the proposed project site, the Santa Ana River Wash is a prominent landscape feature, providing one of the principal riparian woodland habitats in the area (see **PROJECT DESCRIPTION Figure 2**).

### PROJECT AREA SETTING

#### ***POWER PLANT VIEWSHED***

**VISUAL RESOURCES Figure 1** shows the area from which the proposed power plant would be visible, also called the viewshed. The project viewshed extends south from the San Bernardino International Airport to Interstate 10, and includes the commercial and residential development extending west of the power plant to Tippecanoe Avenue and the agricultural/residential development extending east of the power plant site to Highway 30 (MVPC 2000a, p. 6.6-1).

The majority of viewers of the site would be motorists on the roads local to the plant site including but not limited to Mountain View Avenue, San Bernardino Avenue, Lugonia Avenue, California Avenue, Tippecanoe Avenue, Interstate 10, and Highway 30. There are also a number of residences within view of the site along Mountain View Avenue, San Bernardino Avenue, Cooley Avenue, and Victoria Avenue. However, these residences generally have an indirect view of the project. Also, views from these residences tend to be at least partially obstructed by other residences, front yard and roadside vegetation, and existing structures as illustrated in **VISUAL RESOURCES Figures 2 through 5**. Additional viewers would include nearby residences on Lugonia Avenue and agricultural, industrial, and commercial workers in the immediate vicinity of the project. In addition to nearby residences with views of the site, other sensitive viewers would include users of the adjacent (to the north) Santa Ana River Trail and users of the Palm Meadows Golf Course on the north side of the Santa Ana River Wash.

Project visibility would be attenuated with increasing distance, particularly at times of the year when conditions of poor visibility persist. Vapor plumes from the project, which would extend above the tallest project structures, could be seen from greater distances than the power plant structures, particularly on clear days that coincide with favorable meteorological conditions for plume formation (low temperature and high humidity).

### ***POWER PLANT VICINITY***

The MVPP would be located in a complex landscape consisting of a mosaic of industrial, residential, agricultural, and natural features. Immediately to the north of the site is the open, linear expanse of the Santa Ana River Wash which is paralleled on the south by the undeveloped Santa Ana River Trail. To the east of the site are open fields of row crops and beyond those, orchards. To the south and southeast of the site is an existing power plant, switchyard, and transmission line corridor. Also to the south of the site are open fields of row crops, which are bordered on the south and west by residential development. To the west of the site is industrial and residential development. Most nearby residences are located to the west of Mountain View Avenue. The exception is the five residences located on the south side of Lugonia Avenue, due south of the plant site. These five residences face directly north, toward the plant site. Southeast of the proposed plant site, and located adjacent and to the north of Interstate 10 is the Pharaoh's Lost Kingdom Amusement Park and water slide. Views of the site are available from the steps up to the water slide and from the upper platforms on the water slide.

The project site and the surrounding landscape are characterized by views that are generally panoramic and relatively unobstructed due to the openness of the surrounding agricultural fields. However, the site is situated within an industrial appearing context which is provided by the existing power plant, switchyard, transmission lines and adjacent (to the west) industrial facilities. Most views would be from the west and south with the plant site, existing energy infrastructure, and agricultural fields appearing in the foreground to middleground, with the San Bernardino Mountains providing a backdrop of horizontal to angular forms. Most developed features appear gray in color against a lavender backdrop of mountain ranges. Foreground views are often dominated by the green coloration of the row crops to the south of the site, but crop coloration is transient by nature, changing with the season and crop type.

There are a few views of the site from the north. Most notably would be views from the adjacent Santa Ana River Trail, a regional multi-use/recreational trail in the development stage (portions of which are under construction) that will parallel the south side of the Santa Ana River Wash. North of the Santa Ana River Wash, the San Bernardino International Airport (directly across from the plant site) substantially limits visual access to the site. The most notable views of the site from the north are the southerly views from the Palm Meadows Golf Course. Views of the site from the golf course are available from several fairways and greens, the entrance to the clubhouse, and the parking lot. Views from Interstate 10 to the south of the site, and Highway 30 to the east of the site would be intermittent and

brief due to screening by roadside structures and vegetation, and the high rate of vehicle speeds. There are no eligible or designated scenic highways in the vicinity of the proposed site.

### ***NATURAL GAS PIPELINE***

**VISUAL RESOURCES Figure 6** shows the proposed routes of the various linear facilities including the natural gas pipeline. The pipeline will be approximately 17 miles in length and will originate from the Southern California Gas main lines near Etiwanda Avenue at the western edge of Rancho Cucamonga. Extending east to the proposed power plant site, the pipeline will be located within the city streets of several local jurisdictions. Adjacent uses include residential, commercial, and industrial uses. **VISUAL RESOURCES FIGURE 6** also shows the location of several photographs taken along the proposed pipeline route and **VISUAL RESOURCES Figures 7 through 13** show the views at each of the photo locations along the pipeline route. As can be seen from these images, the visual setting of the pipeline route encompasses typical urban landscapes consisting of residential, commercial, and industrial development; roadside utility infrastructure, and motor vehicles and pedestrians. As a result of the long history of urbanization in this area, there is very little naturally appearing vegetation and landforms with the exception of the Santa Ana River Wash, which is a prominent, naturally appearing landscape feature at the Tippecanoe overcrossing. With one exception, the pipeline will be located underground. The location where the pipeline will be located aboveground where it spans the wash adjacent to the railroad tracks between Pennsylvania Avenue and Mount Vernon Avenue (**VISUAL RESOURCES Figure 9**).

### ***WATER SUPPLY PIPELINE***

**VISUAL RESOURCES Figure 6** also shows the location of the proposed 12- or 16-inch, 2.3-mile water supply pipeline that would extend from the Redlands Wastewater Treatment Plant to the proposed project site. The proposed water supply pipeline is within the power plant vicinity described above.

### ***WASTEWATER DISCHARGE PIPELINE***

**VISUAL RESOURCES Figure 6** identifies the location of that portion of the 1,100-foot long wastewater discharge connector pipeline that would extend from the endpoint of the out-of-use water pipeline across Twin Creek Channel to the easternmost terminus of the existing Santa Ana Regional Interceptor (SARI) discharge line. **VISUAL RESOURCES Figure 14** presents a photograph of the golf cart bridge with steel girder construction and the surrounding environment. The golf course is located below the level of the adjacent berm shown in the photograph. As illustrated in the photograph, the landscape is generally open, encompassing the drainage channel, golf course and associated landscaping, and the adjacent urban development, utility infrastructure, and industrial uses

### ***CONSTRUCTION LAYDOWN AREAS***

The proposed construction laydown areas are within the power plant vicinity, described above.

## **VIEW AREAS AND KEY OBSERVATION POINTS**

Staff evaluated the visual setting and proposed project in detail from four key viewing areas. **VISUAL RESOURCES Figure 1** shows the location of the key observation points (KOPs) used to represent these areas. Visual Analysis Data Sheets are provided for each KOP in Appendix A.

### **KOP 1 – LUGONIA AVENUE RESIDENCES**

KOP 1 was selected to characterize the impact to five residences due south of the power plant site, on the south side of Lugonia Avenue. The view from the residences is due north toward the proposed project site at a distance of approximately 0.65 miles. As shown in **VISUAL RESOURCES Figure 15A**, this location provides a panoramic view to the north encompassing level foreground fields of agricultural row crops, a substantial amount of energy infrastructure (power plant and transmission lines) in the middleground, with a backdrop provided by the San Bernardino Mountains. Views from the residences toward the proposed power plant site are direct (frontal). For the purposes of this report, a view is considered direct or “frontal” if the angle of view is within 45° left or right of the primary view direction (typically the direction of travel for motorists or residence’s frontal facing view direction). A view is considered indirect or “peripheral” if the angle of view is greater than 45° off the primary view direction.

#### ***Visual Quality***

The view to the north from KOP 1 encompasses a foreground to middleground panoramic landscape lacking distinctive scenic features and dominated by green agricultural row crops, Lugonia Avenue, and energy infrastructure. The San Bernardino Mountains rise abruptly in the background, providing a tan to lavender backdrop of horizontal to angular landforms, adding some visual variety and interest as does the contrast between the flat agricultural fields and angular, mountainous landforms. However, the prominence of energy infrastructure with industrial visual character lessens overall visual quality, which is considered low-to-moderate.

#### ***Visual Absorption Capability***

The proposed project would be located adjacent to an existing power plant on level terrain, in the middleground of the view from KOP 1. The new structures would be viewed within the context of a substantial amount of existing energy infrastructure that establishes similar complex industrial-appearing forms and lines in the landscape. The existing facilities would also provide some screening of the project. These two factors would increase visual absorption capability (VAC), as would the solid backdrop provided by the San Bernardino Mountains to the north. However, the openness of the flat foreground agricultural fields decreases VAC, which is considered moderate-to-high as viewed from KOP 1.

#### ***Viewer Sensitivity***

KOP 1 is located adjacent to the five residences on the south side of Lugonia Avenue. These residences have direct (frontal) views of the plant site to the north. At this location, viewers observe a landscape comprised of a mosaic of agricultural, industrial, and residential uses, with a prominent backdrop of angular mountain

landforms. Overall viewer sensitivity is considered high for the residences and low-to-moderate for motorists on Lugonia Avenue.

### ***Viewer Exposure***

Site visibility is moderate-to-high in that views of the site across the foreground, open agricultural fields are generally unobstructed at a middleground viewing distance with the exception of some screening provided by the existing power plant. Although the number of viewers is low for the five residences, the number of motorists on Lugonia Avenue is considered moderate. Duration of view is extended. The moderate-to-high visibility of the middleground visual elements and extended viewing opportunity is partially offset by the low-to-moderate numbers of viewers. Therefore, overall viewer exposure would be moderate.

### ***Visual Impact Susceptibility***

The low-to-moderate visual quality and moderate-to-high visual absorption capability generally offset high residential viewer sensitivity and overall moderate viewer exposure, resulting in a visual impact susceptibility that is considered low for motorists on Lugonia Avenue and moderate for the five residences.

Essentially, the lower visual quality landscape has existing characteristics that will be able to accommodate the proposed project without generating high visual contrast. Since motorist viewer sensitivity to the likely changes would be low-to-moderate and their viewing opportunity would be low-to-moderate given their indirect view and travel speed on Lugonia Avenue, the conclusion is that the likelihood that a severe visual impact would result for motorists under this scenario is low. However, the likelihood that a severe visual impact would occur for the five residences is considered moderate given their higher sensitivity to change and more extended viewing opportunity.

## **KOP 2 – PALM MEADOWS GOLF COURSE**

KOP 2 was selected to characterize the visual impact to the Palm Meadows Golf Course located approximately 0.45 mile northeast of the project site, directly across the Santa Ana River Wash. KOP 2 was placed at the entrance to the clubhouse, viewing to the southeast toward the power plant site. From this location, the view toward the site is relatively open and unobstructed across level terrain though the cooling towers will be partially screened from view by intervening vegetation. The view from KOP 2 looks out through formal landscaping, across the golf course parking lot, and over riparian woodland vegetation adjacent to the Santa Ana River Wash (see **VISUAL RESOURCES Figure 16A**). Several of the fairways and greens will also have views of the power plant site. The mountains to the south are visible as distant background features.

### ***Visual Quality***

The view from the clubhouse entrance is dominated by foreground formal landscaping, riparian woodland adjacent to the Santa Ana River, and the golf course parking lot. The existing power plant is a prominent middleground visual element that is backdropped by the existing transmission line corridor and the

mountains to the south. The prominence of the formal landscaping in the foreground (not completely visible in the photograph), the riparian woodland vegetation, and the visibility of the mountains to the south which add variety to the landscaping, all are positive contributors to visual quality as is the vivid green coloration of the landscape. However, the presence of the foreground parking lot and the middleground energy infrastructure tend to detract from the visual quality of the view. As a result, overall visual quality is considered moderate.

### ***Visual Absorption Capability***

The proposed project would be located on level terrain in the middleground. New structures would be placed within the context of a substantial amount of existing energy infrastructure that establishes similar complex industrial-appearing forms and lines in the landscape. Formal landscaping at the golf course and the intervening riparian woodland vegetation would provide some screening of the proposed project and the distant mountains would provide a solid backdrop for a portion of the proposed facilities. However, the most prominent power plant components would be clearly visible from the clubhouse entrance and would extend above the distant horizon provided by the southern mountains. Overall visual absorption capability (VAC) as viewed from KOP 2 would be low-to-moderate.

### ***Viewer Sensitivity***

The power plant site would be visible from the clubhouse entrance and several fairways and greens. Recreational users of the golf course generally anticipate open, highly vegetated landscapes that, though artificially structured, provide opportunities to view a landscape of natural forms and colors which is an integral aspect of the golfing experience. Features with industrial character would not be perceived as consistent with the landscape/natural character of the typical golf course aesthetics. Overall viewer sensitivity is considered high.

### ***Viewer Exposure***

Site visibility is moderate-to-high in that the view of the site from KOP 2 is generally unobstructed at a middleground viewing distance except for a partial screening of the proposed cooling towers. The number of viewers and duration of views from the golf course would be moderate, as would the overall viewer exposure.

### ***Visual Impact Susceptibility***

For users of the golf course, the moderate visual quality, low-to-moderate visual absorption capability, high viewer sensitivity, and moderate exposure result in a visual impact susceptibility that is considered moderate.

## **KOP 3 – SAN BERNARDINO AVENUE**

KOP 3 was selected to capture the potential visual impact from the intersection of San Bernardino and California Avenues. This KOP represents the point at which the power plant can first be seen from a vehicle travelling westbound on San Bernardino Avenue. Further east on San Bernardino Avenue, the view of the power plant is blocked by orange groves located on the north side of the street (MVPC 2000a, p. 6.6-15).

### ***Visual Quality***

The view from KOP 3 to the west and northwest is of similar character to KOP 1, encompassing a foreground to middleground panoramic scene dominated by open agricultural fields of row crops, San Bernardino Avenue, and a profusion of energy infrastructure (see **VISUAL RESOURCES Figure 17A**). To the north, the San Bernardino Mountains are characterized by horizontal to angular landforms of lavender coloration. The contrast between the flat agricultural fields and angular mountains contributes visual variety and interest to a landscape supporting a substantial amount of energy infrastructure of industrial character. Overall visual quality is considered low-to-moderate, reflecting the prominence of built infrastructure.

### ***Visual Absorption Capability***

The proposed project would be located on level terrain in the middleground. New structures would be placed within the context of a substantial amount of existing energy infrastructure that establishes similar complex industrial-appearing forms and lines in the landscape. Also, when not obscured by haze, the San Bernardino Mountains would provide a solid backdrop to the proposed plant. Both of these factors would increase visual absorption capability (VAC). However, the openness of the flat foreground terrain and lack of intervening screening decreases VAC. Overall visual absorption capability as viewed from KOP 3 is rated moderate.

### ***Viewer Sensitivity***

Westbound motorists on San Bernardino Avenue would have a direct (frontal) to indirect (peripheral) view of the plant site to the north. Motorists along this portion of San Bernardino Avenue anticipate a mosaic landscape of agricultural, industrial, and residential uses, including a substantial presence of electric transmission and distribution lines. Overall viewer sensitivity is considered low-to-moderate.

### ***Viewer Exposure***

Project visibility is high due to the open and generally unobstructed view of the middleground project site over the foreground, low-growing agricultural row crops. While the number of potential viewers would be low-to-moderate, the potential view duration would also be moderate since motorists would have frontal to peripheral views of the site, the length of San Bernardino Avenue between California Avenue and Mountain View Avenue. The resulting overall viewer exposure is considered moderate.

### ***Visual Impact Susceptibility***

From KOP 3 and along San Bernardino Avenue, the low-to-moderate visual quality and viewer sensitivity, and moderate visual absorption capability and viewer exposure result in a low-to-moderate visual impact susceptibility.

## **KOP 4 – SANTA ANA RIVER TRAIL**

KOP 4 is located westbound on the Santa Ana River Trail (SART), immediately adjacent, and to the northwest of the proposed plant site. The SART is an alternative transportation and recreational corridor along the Santa Ana River,

spanning a three-county area. Portions of the trail are currently under construction. The County of San Bernardino, in cooperation with the Wildlands Conservancy and National Park Service, intends to have the local portion of the SART open for regular use within two to three years and completed by 2005. It is expected that the SART will become an alternative transportation corridor (e.g. bikeway) as well as a recreation trail (MVPC 2000a, p. 6.6-17). KOP 4 was selected to capture the visual impact to recreational and other users of the SART. Views from the trail toward the site would be direct, to the south and southwest. The viewshed encompasses a panoramic landscape of primarily naturally appearing features consisting of riparian woodland and scrub vegetation (see **VISUAL RESOURCES Figure 18A**). Industrial structures are also occasionally apparent in the viewshed.

### ***Visual Quality***

The view to the southwest and west encompasses a foreground to middleground dominated by the undeveloped Santa Ana River Trail (SART) and riparian woodland and scrub vegetation immediately adjacent and to the south of the Santa Ana River dry wash. In contrast to the surrounding urban and agricultural development, the landscape along this portion of the trail is primarily naturally appearing though nearby industrial facilities (including the existing power plant) are visible in the background. Overall visual quality is considered moderate.

### ***Visual Absorption Capability***

The proposed project would be located on level terrain in the middleground. In addition to the existing power plant, an adjacent (to the west) industrial plant also establishes complex industrial-appearing forms and lines. Although these existing facilities provide somewhat of a developed context for the proposed project, the minimal amount of screening and level terrain adjacent to the SART, and close proximity of the proposed structures to the SART, will result in the new facilities protruding above the horizon or “skylining,” thus, increasing project noticeability. Therefore, overall visual absorption capability (VAC) as viewed from KOP 4 is rated low-to-moderate.

### ***Viewer Sensitivity***

Recreational users of the SART would typically enjoy views of a predominantly natural appearing landscape consisting of the Santa Ana River Wash and riparian woodland and scrub vegetation. Other users would access the trail as an alternative to the more highly urbanized travel routes along existing city streets. While complex, industrial-appearing structures similar to that of the proposed facility are occasionally visible in the immediate vicinity of KOP 4, they are not prominent features in the landscape as viewed from KOP 4. Such structures of industrial character would not be considered consistent with the character of the natural features that form the core of viewer expectations along the SART. Overall viewer sensitivity for the users of the SART is considered high.

### ***Viewer Exposure***

Site visibility as a middleground feature is moderate-to-high from the SART. The number of viewers would be low-to-moderate and the duration of view would be

extended due to the low travel speed along the SART. The moderate-to-high visibility as a middleground visual element with extended viewing opportunity, is partially offset by low-to-moderate numbers of viewers, resulting in an overall moderate viewer exposure. It should also be noted that, though the potential number of viewers is currently low, SART users will increase in number substantially as the trail is developed. As that occurs, viewer exposure will increase.

### ***Visual Impact Susceptibility***

The moderate visual quality, high viewer sensitivity, and low-to-moderate visual absorption capability are the primary contributors to a determination that visual impact susceptibility would be moderate-to-high for users of the SART at KOP 4.

## **IMPACTS**

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### **PROJECT SPECIFIC IMPACTS**

#### **CONSTRUCTION IMPACTS**

##### **POWER PLANT**

Construction of the proposed power plant would cause temporary visual impacts due to the presence of equipment, materials, and workforce. These impacts would occur at the proposed power plant site and construction laydown areas over a 19-month period of time. Construction would involve the use of heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. These structures and pieces of equipment would be stored on and adjacent to the project site in an area already exhibiting industrial visual character. Thus, power plant construction would result in an adverse but not significant visual impact.

##### **LINEAR FACILITIES**

Views of the natural gas pipeline construction equipment, materials, and activities would be available to residents, commercial occupants, and motorists along the roads the pipeline will be following. A typical pipeline spread would affect a linear area of approximately 300 to 400 feet. Pipeline construction would be highly visible in the foreground of views to the adjacent residential and commercial uses. However, occupants would have a frontal view of the pipeline laying equipment for a relatively short period of time depending upon existing obstructions and adjacent screening. The estimated exposure for adjacent residents and/or businesses would be approximately one month at any location. Views of construction of the water supply pipeline and wastewater discharge connector would be even more limited. The water supply pipeline would be relatively short and would be located along Nevada Street and San Bernardino Avenue where there are few residents and commercial uses. Views of construction of the wastewater discharge connector would be limited to users of the City of San Bernardino Public Golf Course. Views to golf course users would be relatively brief since construction would be limited to the golf cart bridge to which the connector would be attached. Therefore, visual

impacts associated with construction of the project linear facilities would be adverse but not significant.

## **OPERATION IMPACTS**

The analysis of operation impacts is presented for each Key Observation Point (KOP) in the Visual Analysis Data Sheets provided in Appendix A. For each KOP, an evaluation of visual contrast, project dominance, and view blockage is provided with a concluding assessment for the severity of visual change.

### **KEY OBSERVATION POINT 1 – LUGONIA AVENUE RESIDENCES**

**VISUAL RESOURCES** Figure 15B presents a photosimulation of the proposed project as viewed from KOP 1. Although the complex and geometric block forms of the power plant facilities are clearly visible in the middleground, the power plant is less noticeable than it otherwise would be due to the partial screening provided by the existing Power Plant. The cooling towers to the east of the power plant are more visible because there is no intervening screening.

#### ***Visual Contrast***

The following section evaluates the changes that would occur to the three principal landscape components of land and water, vegetation, and structures as a result of project implementation, and the resulting visual contrast that would be caused, if any.

As detailed in the Visual Analysis Data Sheet for KOP 1 (see Appendix A), the landform component of the existing landscape is characterized by level to angular block forms with strong horizontal to irregular lines (background mountain ranges). The color is tan (foreground soils) to lavender (at a background distance) and the landform texture is smooth to granular. With implementation of the proposed project, no apparent landform modification would be noticeable from KOP 1. As a result, landform changes associated with the proposed project will not result in perceptible visual contrast as experienced from KOP 1.

Existing vegetation within the viewshed of KOP 1 is visible as continuous, well-defined blocks with horizontal lines (foreground row crops) and as irregular patchy forms with irregular to indistinct lines (scattered trees and riparian woodland). Vegetation is primarily green in color and generally exhibits a matte texture. With implementation of the proposed project, minimal change to the existing vegetation characteristics will occur. Therefore, any vegetation changes associated with the proposed project are not expected to result in perceptible visual contrast as viewed from KOP 1.

The energy infrastructure (power plant and transmission lines) visible in the foreground to middleground as viewed from KOP 1 range from linear forms associated with the transmission towers and conductors to geometric and complex forms for the existing power plant. Structural line characteristics range from vertical (for the transmission structures and power plant components), to horizontal (for the transmission conductors and power plant components). Existing structure colors

include gray and white and at the KOP 1 viewing distance, structural textures appear smooth.

The proposed project will introduce linear to complex geometric, block forms associated with the power plant facilities. These structural forms would be similar to the existing structural forms on site though they would appear more prominent. The resulting visual contrast would be low with respect to form. Project implementation would also result in structural lines, color, and texture that would repeat the characteristics of the existing structural environment. Therefore, in comparing the proposed with the existing structures, there would be no contrast with respect to line, color, or texture.

In summary, given the low degree of structural form contrast and the absence of structural contrast with respect to line, color, and texture, the overall visual contrast that would be perceived in the KOP 1 viewshed would be low.

### ***Project Dominance***

The most prominent foreground landscape feature in views from KOP 1 is the broad agricultural field. The existing power plant and transmission lines are prominent middleground features, as are the San Bernardino Mountains in the background. The proposed power plant facilities would appear similar in scale in comparison to the existing power plant though the new facilities would be taller. The proposed facilities would also appear smaller than either the foreground agricultural fields or the background mountain range. In the wide field of view available at KOP 1, the proposed structures would appear small to moderate in size. Overall, the proposed facilities would appear comparable to the existing energy infrastructure, which is the dominant middleground landscape feature. Therefore, project dominance is rated co-dominant.

### ***View Blockage***

From Key Observation Point 1 the project would block a relatively small part of the existing view, and much of the area that would be blocked by the proposed project is already blocked by the existing power plant facilities. Therefore, view blockage would be low.

### ***Severity of Visual Change***

From KOP 1, the severity of the visual change that the proposed project would cause, would be low due to the general lack of visual contrast, the minimal change in industrial middleground dominance that would occur, and the low view blockage that would result.

### ***Visual Impact Significance***

As viewed from KOP 1, the low severity of visual change that would occur within the context of low visual impact susceptibility, would result in an adverse but not significant visual impact.

## KOP 2 – PALM MEADOWS GOLF COURSE

**VISUAL RESOURCES Figure 16B** presents a photosimulation of the proposed project as viewed from KOP 2. The geometric block and angular forms of the power plant facilities are clearly visible to the southwest, beyond the golf course parking lot and Santa Ana River Wash. The cooling towers would be partially screened from view by landscaping and riparian woodland vegetation.

### *Visual Contrast*

As detailed in the Visual Analysis Data Sheet for KOP 2 (see Appendix A), the landform component of the existing landscape is characterized by level to angular block forms with horizontal (foreground) to irregular lines (background mountains). The predominant landform color is tan and the landform texture is smooth to granular. With implementation of the proposed project, no landform modifications would be apparent in views from KOP 2 because intervening riparian woodland vegetation would screen the ground level portion of the project from view. As a result, landform changes associated with the proposed project would not result in perceptible visual contrast as experienced from KOP 2.

Existing landscaping and riparian woodland vegetation within the viewshed of KOP 2 is visible as well-defined blocks to irregular patchy clumps with prominent horizontal to irregular lines. Vegetation colors are predominantly shades of green with spot floral colors in reddish hues. Vegetation textures range from smooth to matte. As viewed from KOP 2, no apparent change to the existing vegetation characteristics or increase in associated visual contrast would occur with implementation of the proposed project.

The existing power plant and transmission line structures are clearly visible in the middleground as linear to geometric and complex forms. Structural line characteristics range from vertical (for the transmission structures, exhaust stacks, light standards, and fence posts), to horizontal (for fence lines and pavement edges) and diagonal (for pavement edges). Existing structure colors include gray, tan, and white and at the KOP 2 viewing distance, structural textures appear smooth to rough.

The proposed project would introduce prominent angular, geometric block, and linear forms to the viewshed. As illustrated in **VISUAL RESOURCES Figure 16B**, the angular form of the stack ducts enclosures are particularly noticeable as are the HRSG exhaust stacks which appear considerably more massive than the more distant existing power plant stacks. The resulting visual contrast would be moderate-to-high for form and is primarily attributable to the unusual shape of the stack ducts enclosures. Project implementation would also result in more prominent vertical (stacks) and diagonal (enclosures) structural lines, which do not appear consistent with the less prominent vertical lines of the existing transmission lines and power plant stacks. However, the new lines do appear similar to foreground linear vertical elements. The resulting visual contrast would be moderate for line. The gray structure coloration and smooth texture would be similar to existing structure colors and no visual contrast is anticipated for color and texture.

In summary, the overall visual contrast that would be experienced at KOP 2 would be moderate-to-high and is primarily correlated with the moderate-to-high degree of visual contrast associated with the exhaust ducts enclosure forms and lines.

### ***Project Dominance***

The landscape visible from KOP 2 is comprised of a mosaic of land, vegetative, and structural forms, all appearing co-dominant in the viewshed. The parking lot pavement and vehicles and signage features in the foreground compete with the formal landscaping for the viewer's attention, as does the riparian woodland vegetation and existing power plant in the middleground, and the distant mountain ranges in the background. The proposed power plant facilities would be sufficiently prominent in the middleground that they would appear co-dominant with existing foreground features and dominant over other middleground features and the background mountains. The proposed project would appear moderate in size in the wide field of view. However, the solid massing of the angular and geometric block structures and the resulting structure skylining would increase structural prominence. Therefore, project dominance is rated co-dominant to dominant.

### ***View Blockage***

From KOP 2, the project would block a substantial portion of the background mountains that are visible in the opening in the landscaping. However, this blockage of a higher quality visual element is somewhat balanced by the blockage of the existing transmission lines and power plant which are considered to be of equal or lesser visual quality. The resulting view blockage is considered low to moderate.

### ***Severity of Visual Change***

From KOP 2, the severity of the visual change caused by the proposed project would be moderate-to-strong due to the moderate-to-high degree of structural contrast that would occur and the project's co-dominant-to-dominant presence in the field of view.

### ***Visual Impact Significance***

As viewed from KOP 2, the key existing visual setting characteristics affecting the visual impact would be the moderate visual quality and high viewer sensitivity which lead to a moderate visual impact susceptibility. When the proposed project is considered within this context, the moderate-to-strong severity of visual change that would occur with project implementation results in a significant but mitigable visual impact (see later section entitled Additional Mitigation).

## **KOP 3 – SAN BERNARDINO AVENUE**

**VISUAL RESOURCES** Figure 17B presents a photosimulation of the proposed project as viewed from KOP 3, at the intersection of San Bernardino and California Avenues, southeast of the project site. Motorists westbound on San Bernardino Avenue would have middleground frontal view of the proposed project through existing roadside transmission lines. The angular and geometric block forms of the

power plant facilities are visible to the north of San Bernardino Avenue and the existing power plant.

### ***Visual Contrast***

As detailed in the Visual Analysis Data Sheet for KOP 3 (see Appendix A), the landform component of the existing landscape is characterized by level to angular block forms with horizontal (foreground valley floor) to irregular lines (background mountain ranges). The predominant landform color is tan and the landform texture is smooth to granular. With implementation of the proposed project, no landform modifications would be apparent from KOP 3 and no resulting landform contrast is anticipated.

Existing vegetation within the viewshed of KOP 3 is visible as continuous blocks with horizontal (foreground row crops) to irregular lines (trees along Mountain View Avenue and riparian woodland along the Santa Ana River Wash). Vegetation colors range from green to tan, and generally exhibit a smooth to matte texture. With implementation of the proposed project, no apparent change to the existing vegetation characteristics or increase in visual contrast would be apparent from KOP 3.

The existing power plant and transmission lines are apparent as prominent linear and geometric block forms. Existing structural lines range from vertical for the transmission lines, to horizontal for power plant facilities and pavement, and diagonal for pavement. Most prominent are the transmission/distribution lines along the north and south sides of San Bernardino Avenue that pass by KOP 3 and transition from a foreground to middleground landscape feature. Existing structure colors include gray, tan, and white and at the KOP 3 viewing distance, structural textures appear smooth to granular.

The proposed project will introduce angular to geometric block forms into the existing viewshed. These structural forms would be somewhat similar to the existing power plant facilities though they would be more massive and dense. Particularly noticeable would be the angular form and diagonal lines of the exhaust ducts enclosures and the linear form and vertical lines of the HRSG stacks. The horizontal line of the cooling tower structure would also be prominent. Structure colors would be gray and structure textures would be smooth. The resulting contrast between the existing and proposed structures would be moderate for form and line and none for color and texture. Overall visual contrast as experienced from KOP 3 would be moderate.

### ***Project Dominance***

The most prominent landscape features in the view from KOP 3 are the broad valley floor, roadside transmission line structures, and the San Bernardino Mountains to the north. The proposed power plant facilities would appear similar in scale to the existing power plant though the structures would be more dense and massive. The proposed project would also appear smaller than the foreground agricultural fields or the background mountains. In the wide field of view available at KOP 3, the proposed structures would appear small-to-moderate in size and similar in extent to

that of the existing power plant facilities. Overall, the proposed facilities would appear comparable to the existing energy infrastructure, which is the dominant middleground landscape feature. Therefore, project dominance is rated co-dominant.

### ***View Blockage***

From KOP 3, the project would block a relatively small part of the background valley floor and mountain range. That portion of the San Bernardino Mountains blocked from view by the proposed project is also frequently obscured from view by haze and conditions of poor visibility (as is apparent in **VISUAL RESOURCES Figure 17B**). Therefore, view blockage is rated low at KOP 3.

### ***Severity of Visual Change***

As viewed from KOP 3, the severity of the visual change caused by the proposed project would be low-to-moderate because of the moderate degree of structural visual contrast that would result, the co-dominant presence of the proposed project in relation to the existing landscape features, and the low view blockage that would result.

### ***Visual Impact Significance***

When considered within the context of the low-to-moderate visual impact susceptibility of the existing landscape, the low-to-moderate severity of the visual change that would be observed at KOP 3 would result in an adverse but not significant visual impact.

## **KOP 4 – SANTA ANA RIVER TRAIL**

**VISUAL RESOURCES Figure 18B** presents a photosimulation of the proposed project as viewed from KOP 4. From this location, the project facilities would appear as prominent foreground to middleground features.

### ***Visual Contrast***

As detailed in the Visual Analysis Data Sheet for KOP 4 (see Appendix A), the landform component of the existing landscape is characterized by level block forms with horizontal to curvilinear lines (trail). The predominant landform color is tan and the landform texture is smooth to granular. With implementation of the proposed project, no landform modifications would be apparent in views from KOP 4 because the SART is at a lower grade and the intervening landform and riparian woodland vegetation would screen the ground level portion of the project from view. As a result, landform changes associated with the proposed project would not result in perceptible visual contrast as experienced from KOP 4.

Existing riparian woodland and scrub vegetation within the viewshed of KOP 4 is visible as patchy to irregular clumps with horizontal to irregular lines. Vegetation colors are predominantly green and tan while textures are generally matte in appearance. As viewed from KOP 4, no apparent change to the existing vegetation characteristics or increase in associated visual contrast would occur with implementation of the proposed project.

The existing power plant and adjacent industrial facility are clearly visible in the background as geometric and complex forms. Structural line characteristics range from vertical (for the exhaust stacks) to horizontal. Existing structure colors are gray and at the KOP 2 viewing distance, structural textures appear smooth.

The proposed project would introduce prominent geometric and angular block and linear forms to the existing landscape. As illustrated in **VISUAL RESOURCES Figure 18B**, the vertical HRSG exhaust stacks and angular form of the stack ducts enclosures are particularly noticeable though they are partially screened from view at this location. Also prominent in the foreground is the cooling tower structure with its substantial geometric form. The resulting visual contrast would be high for form. Project implementation would also result in more prominent vertical (stacks) and diagonal (enclosures) structural lines, which do not appear consistent with the less prominent vertical lines of the existing structures. Also, the prominent foreground horizontal to diagonal lines associated with the cooling tower structure are not typical of the visible existing facility characteristics. The resulting visual contrast would be moderate-to-high for line. The gray structure coloration and smooth texture would be similar to existing structure colors and no visual contrast is anticipated for color and texture.

In summary, the overall visual contrast that would be experienced at KOP 4 would be high and is primarily correlated with the high degree of form contrast and moderate-to-high degree of line contrast associated with the exhaust ducts enclosure, HRSG stacks, and cooling tower structure.

### ***Project Dominance***

Foreground riparian woodland vegetation and the graded Santa Ana River Trail dominate the landscape visible from KOP 4. The existing power plant and adjacent industrial facility are subordinate background features. The proposed project would appear large in size in the field of view and would exhibit considerable structure skylining, which would increase structural prominence. The substantial mass of the proposed power plant structures would dominate the foreground to middleground landscape.

### ***View Blockage***

Due to the lower elevation of KOP 4 relative to the proposed project, much of the project would extend above the existing horizon, which would substantially increase project noticeability. As a result, significant “skylining” would occur. While the project would screen the existing power plant from view, it would not block views of landscape features of higher visual quality. The resulting view blockage is considered low.

### ***Severity of Visual Change***

From KOP 4, the severity of the visual change caused by the proposed project would be strong due to the high degree of structural contrast that would occur and the project’s dominant presence in the foreground to middleground of views.

## ***Visual Impact Significance***

As viewed from KOP 4, the key existing visual setting characteristics affecting the visual impact would be the moderate visual quality, low-to-moderate visual absorption capability, and high viewer sensitivity which lead to a moderate visual impact susceptibility. When the proposed project is considered within this context, the strong severity of visual change that would occur in a foreground proximity results in a significant but mitigable visual impact (see later section entitled Additional Mitigation).

## **LINEAR FACILITIES**

With the exceptions of the wastewater discharge connector, which will be attached to an existing golf cart bridge, and the gas pipeline span over the wash adjacent to the railroad tracks near the Mill Street crossing, the remainder of the linear facilities would be located underground within existing roads. There would be no apparent evidence of the pipeline's presence and long-term project visibility would be limited to an occasional aboveground warning marker.

At the Twin Creek Channel crossing, the suspended wastewater discharge pipeline would be visible from a tee box located east of the bridge and a tee box and fairway west of the bridge. Given the pipeline's relative small diameter (12 inches), and the existing steel girder construction of the bridge, the pipeline would not be particularly noticeable to users of the golf course. Although the span of the wash at Mill Street would be visible, it would not be noticeable from Mill Street. Therefore, long-term visual impacts due to the operation of the linear facilities would be less than significant.

## **LIGHTING**

The proposed units 3 and 4 would require nighttime lighting for operational safety and security. To reduce the offsite impacts from this night lighting, the applicant has committed to directing the lights towards the middle of the property and away from the outer site boundaries to reduce light scatter and glare. Additionally, fixtures are to be of the non-glare type (MVPC 2000a, p. 6.6-20). The applicant has also stated the following in regard to exterior lighting:

"All outdoor lighting shall be controlled by photocells" (MVPC 2000k, Response to Data Request 117). In addition, "...exterior structure lighting will be both directed and covered so as to provide only necessary access illumination and navigational illumination. Task area lighting will be equipped with switches enabling unnecessary lighting to be switched off when not needed" (MVPC 2000k, Response to Data Request 119). Switches will include the use of "timers and sensors" (MVPC 2000k, Response to Data Request 118).

However, because the potential exists for the project to cause significant nighttime lighting impacts, the Energy Commission staff has expanded the applicant's proposed design measures in a proposed condition of certification (see below). Proper implementation of these measures is expected to minimize lighting and keep lighting impacts to less than significant levels.

## **VISIBLE PLUMES**

The visibility of plumes depends partly on viewing conditions. The visibility of nighttime plumes depends on the degree to which they are illuminated. Because the applicant has proposed to minimize exterior lighting by installing timers and sensors to provide illumination on an “as needed” basis only, and will design illumination to achieve appropriate direction and shielding, the plumes are not expected to be substantially visible at night.

### ***Cooling Tower Plumes***

The applicant has stated the following regarding cooling tower plume visibility:

“A water-vapor plume will be visible from the power plant’s cooling towers for some number of hours per year depending on meteorological conditions. However, whether one could, in fact, see the water-vapor plume would also depend on whether the observation is made during daylight or nighttime hours; if during nighttime hours, whether there is sufficient light (from natural or anthropogenic sources) to reflect off of the plume; and whether there are physical obstructions, such as terrain, or meteorological obstructions, such as fog, that would prevent observation of the plume. The height and width of the visible water-vapor plume from the cooling towers will depend on meteorological conditions.

The height of the plume (whether visible or not) will be a function of the buoyant rise of the air from the cooling towers. The width of the visible water-vapor plume will depend on the length of time it takes for the plume to be diluted with ambient air such that the moisture content of the air drops below the dew point, and hence the plume becomes visible” (MVPC 2000k, Response to Data Request No. 121).

Staff reviewed the model input parameters and meteorological data provided by the applicant and concluded that the information accurately characterizes the proposed project and prevailing meteorological conditions. The results indicate that visible steam plumes during the day will occur approximately 3% of the modeled year. These plumes will have an average height of 97 meters (318 feet), with a maximum height of 575 meters (1,886 feet). They have an average width of 23 meters (75 feet), with a maximum width of 159 meters (522 feet). The maximum length of the steam plume is predicted to be approximately 2,000 meters (6,562 feet). Plumes this large are estimated to occur only three hours during the modeled year. However, the nearest resident is just over 1,000 feet from the cooling towers. From the results presented by the applicant, the steam plume from the cooling towers will overshadow the nearest resident at least four hours in the modeled year. Staff considers these results to conservatively represent the potential steam plume formation at each cell in each cooling tower proposed by the applicant (Loyer 2000).

In Response to Data Request No. 121, the applicant provided the following information regarding plume frequency:

“Table [3] indicates the frequency with which the water-vapor plume from the cooling towers would be visible for various plume lengths. As shown in Table [3], a

plume of some length will be theoretically visible 273 hours per year, or 3.1% of the time; however, only 138 of these hours will be during daylight. During nighttime hours, an observer could see the plume only if there were sufficient natural or artificial light. Of these theoretically visible water-vapor plumes, 78% of them will be less than or equal to 100 meters in length, 86% will be less than or equal to 200 meters, and 96% of them will be less than or equal to 1,000 meters. While the above conclusions are based on an analysis of a single cooling tower cell, all of the cooling tower cells are expected to result in a visible water-vapor plume under similar meteorological conditions.”

**Table 3**  
**Length of Cooling Tower Visible Water-Vapor Plume**  
**vs. Frequency of Occurrence**

Plume Length (meters)	All Hours	Daylight Hours
100	213	125
200	234	134
500	251	134
1000	261	135
2000	270	138
All	273	138 (~3%)

In a supplemental response to Data Request No. 121 (MVPC 2000k, Responses to Data Requests 99 to 123 and MVPC 2000dd) the applicant provided additional plume dimension and frequency data from a different model (Seasonal/Annual Cooling Tower Impacts – SACTI). The frequency data from the SACTI model indicate that a visible plume would be visible for up to 188 daylight hours per year (MVPC 2000k, Responses to Data Requests 99 to 123). Table 4 provides the maximum and median plume dimensions obtained from the SACTI model and their frequency of occurrence. The data is provided for both sizes of cooling towers: Units 1 and 2 (two 10-cell tower structures) and Units 3 and 4 (two 4-cell tower structures).

**Table 4**  
**Plume Dimensions and Frequency of Occurrence (SACTI Model)**

Simulation	Units	Plume Type	Height (m)	Length (m)	Width (m)	Hrs. / Year	% of Hrs.
All Hours	Units 1 & 2	Median	20	20	4	135.4	1.5
		Maximum	170	460	40	2.3	0.03
	Units 3 & 4	Median	20	10	6	182.3	2.1
		Maximum	195	450	35	3.2	0.04
Daytime Only	Units 1 & 2	Median	30	20	6	149.7	3.4
		Maximum	140	220	28	11	0.13
	Units 3 & 4	Median	30	20	10	188.5	4.3
		Maximum	150	400	42	4.2	0.05

Using the SACTI model, the results show that for the All Hours scenario, the median plume for Units 1 and 2 is expected to be visible for 135.4 hours per year, or 1.5% of the time, and the maximum plume is expected to be visible for 2.3 hours per year, or 0.03% of the time. For the All Hours Scenario, the median plume for Units 3 and 4 is expected to be visible for 182.3 hours per year, or 2.1% of the time, and the maximum plume is expected to be visible for 3.2 hours per year, or 0.04% of the time.

For the Daytime Only scenario for Units 1 and 2, the median plume is expected to be visible for 149.7 hours per year, or 3.4% of the daylight hours, and the maximum plume is expected to be visible for 11.0 hours per year, or 0.13% of the daylight hours. For the Daytime Only scenario for Units 3 and 4, the median plume is expected to be visible for 188.5 hours per year, or 4.3% of the daylight hours and the maximum plume is expected to be visible for 4.2 hours per year, or 0.05% of the daylight hours.

In addition, the applicant conducted a SACTI analysis for scenarios with visibility greater than 5 miles. For both the All Hours scenario and the Daytime Only scenario, the plume dimensions and frequency of occurrence were generally similar to the results presented above.

Based on the results of the various model runs, views of maximum size cooling tower plumes would be available from a relatively large geographic area, extending beyond the viewshed boundary for the power plant presented in **VISUAL RESOURCES Figure 1**. However, cooling tower plumes would at most, be visible three to four percent of the time and foreground to middleground views of the stack plumes would generally be limited to those close proximity viewing opportunities along Mountain View Avenue, San Bernardino Avenue, Lugonia Avenue, California Avenue, the Santa Ana River Trail, and the Palm Meadows Golf Course. More distant views of the plume would be available from Interstate 10, Highway 30, Tippecanoe Avenue, and areas north of the San Bernardino International Airport.

As previously discussed the visual quality experienced from most areas in the project region as represented by the selected KOPs ranges from low to moderate. Since daylight meteorological conditions in the project area are sufficiently warm and dry much of the year to minimize plume formation, the larger, more visible plumes would typically occur in the winter, during nighttime and early morning hours. Also, the conditions necessary for plume formation would also likely coincide with off-peak use of both the Santa Ana River Trail (KOP 4) and the Palm Meadows Golf Course (KOP 2).

The users of the SART and Golf Course, as well as the residences located near to the project site (KOP 1) and motorists on nearby roads such as San Bernardino Avenue (KOP 3), would experience adverse visual impacts from plume formation. However, due to the anticipated low frequency of plume occurrence during the daylight hours, the resulting adverse visual impact is not expected to be significant.

## **Exhaust Stack Plumes**

In Response to Data Request No. 122, the applicant stated:

“When present, the height of the plume from the HRSG exhaust stack will average approximately 381 meters above ground level. The maximum height of the visible water-vapor plume from the HRSG exhaust stacks is estimated to be approximately 1,103 meters above ground level. The width of the visible water-vapor plume will depend on the length of time it takes for the plume to be diluted with ambient air such that the moisture content of the air drops below the dew point, and hence the plume becomes invisible. The average width of the visible water-vapor plume from the HRSG exhaust stacks is estimated to be approximately 69 meters. The maximum width is estimated to be approximately 103 meters. The estimates of the height and width of the visible water-vapor plumes are less certain than the estimates of frequency presented below.

As shown in Table 5, a plume of some length theoretically will be visible four hours per year; however, none of these hours will be during daylight. During nighttime hours, an observer could see the plume only if there were sufficient natural or artificial light. Of these theoretically visible water-vapor plumes, 50% of them will be less than or equal to 100 meters in length and 75% will be less than or equal to 200 meters” (MVPC 2000k, Responses to Data Requests 99 to 123).

**Table 5**  
**Length of HRSG Visible Water-Vapor Plume**

<b>Plume Length (meters)</b>	<b>All Hours</b>	<b>Daylight Hours</b>
≤ 100	2	0
≤ 200	3	0
All	4	0

None of the HRSG plumes would be visible during daylight hours. Also, given the applicant’s commitment to minimize exterior lighting and light scatter as discussed above, the HRSG plumes are not expected to be substantially visible at night. Therefore, no significant visual impact is anticipated with respect to HRSG plume formation.

## **CONSIDERATION OF IMPACTS IN RELATION TO CEQA SIGNIFICANCE CRITERIA**

This analysis considered the potential impacts of the proposed project in relation to the four significance criteria for visual resource impacts listed in Appendix G of the CEQA Guidelines, under Aesthetics, specified below.

### **1. Would the project have a substantial adverse effect on a scenic vista?**

Although panoramic vistas are available to nearby residents and motorists on project vicinity roads, there are no recognized scenic vistas in the project

viewshed. Therefore, the project would not cause significant visual impacts in regard to this criterion.

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The foreground to middleground landscape consists primarily of agricultural row crops with a substantial amount of energy infrastructure. Views from nearby residences and from local roads and Interstate 10 are not considered scenic so the project is not anticipated to cause significant visual impacts in regard to this criterion.

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

As discussed above, the proposed project would introduce prominent structures of industrial character into the foreground to middleground of views from the Santa Ana River Trail (KOP 4) and the middleground of views from the Palm Meadows Golf Course (KOP 2). Users of these facilities are considered highly sensitive to landscape change and the proposed project would substantially degrade the quality of views from these two public recreation facilities.

Therefore, the project is expected to cause significant visual impacts in regard to this criterion. However, implementation of the proposed mitigation measures, as expanded by staff (see below) would reduce project impacts to a level that would be less than significant.

4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

The project has the potential to create a new source of substantial light that would adversely affect nighttime views in the area. However, the exterior lighting control measures proposed by the applicant and expanded by staff (see below) would ensure that lighting impacts would be less than significant.

## **CUMULATIVE IMPACTS**

Cumulative impacts to visual resources would occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast is increased.

While the County of San Bernardino and the City of Redlands have indicated that there are no planned or proposed projects in the immediate vicinity of the proposed power plant that would create significant visual impacts (MVPC 2000a, p. 6.6-45), the proposed project will add industrial features into the project area. Thus, the proposed project would contribute to the cumulative visual impacts of existing development in the project vicinity and in the San Bernardino Valley by increasing the industrial character of the landscape as viewed from locations within the viewshed of the project site, specifically, the recreational facilities represented by KOP 2 and 4. In each case, additional structures of industrial character will be visible within the same viewshed as existing industrial facilities. The resulting cumulative impact would be significant but mitigable.

Since there will be minimal aboveground visible evidence of the linear facilities as discussed above, no adverse visual impacts are anticipated and no cumulative visual impacts would occur.

Plumes from the proposed cooling tower stacks would occur infrequently and then mostly during nighttime and early morning hours in winter. At those times that the plumes would be visible, they would contribute to cumulative visual impacts on views from the project area. However, the low frequency of visibility would result in adverse but not significant cumulative visual impacts.

## **FACILITY CLOSURE**

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### **INTRODUCTION**

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

### **PLANNED CLOSURE**

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures.

### **UNEXPECTED TEMPORARY CLOSURE**

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

### **UNEXPECTED PERMANENT CLOSURE**

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner

is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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### **LOCAL**

The following section addresses compliance with the applicable LORS for San Bernardino County and the City of Redlands. Although the project's linear facilities pass through several other local jurisdictions, these facilities would be underground. Since there would be no long-term aboveground evidence of the project, the LORS pertaining to visual resources within these jurisdictions would not apply the linear project components.

#### ***SAN BERNARDINO COUNTY***

The proposed project site is located within the East Valley Sub-region. Properties due east and south of the project site are included in the East Valley Corridor Specific Plan-1999 (EVCSP), whereas the project site is excluded from the EVCSP. The specific section of the General Plan that has relevance to visual resources is Division II.C.5-Natural Resources-Open Space/Recreation/Scenic, Section 8-Scenic Resources. The Scenic Resource Goals are to: (1) Preserve and protect the outstanding scenic resources of San Bernardino County for their continued future enjoyment; (2) Restrict development along scenic corridors; and (3) Provide for visual enhancement of existing and new development through landscaping. As delineated in Section 4 of Division II.C.4, trails are also considered to be part of the County's scenic resources.

Landscape features meeting specific criteria are to be specifically defined as scenic, unless a clear finding can be made that no scenic values are present. One of the stated criteria is "Any portion of the regional trail system (page II-C5-107)." The proposed Santa Ana River Trail (SART) will be located along the flood control access roadway on the south edge of the Santa Ana River, immediately north of the proposed project site boundary. OR-51 of the General Plan includes the following: "Development along scenic corridors shall be required to demonstrate through visual analysis that proposed improvements are compatible with the scenic qualities present.

Development Code Sections 85.030601, 85.030605, and 85.030610 establish the Scenic Resources Overlay District (SROD) requirements applicable to the project. Section 85.030610 provides the appropriate development standards for Building and Structure Placement, Review Areas, Access Drives, Landscaping, Roads, and Aboveground Utilities. The existing power plant use of the site provides a preexisting use compatible with the project. Additionally, the project will comply with the requirements of Section 85.030610 and minimize visual disturbance through design and landscaping compatible with the natural landscape, providing adequate

screening of buildings and parking areas, and avoiding the alteration of natural topography (MVPC 2000k, Response to Data Request No. 123). Section 89.0101 is also related to these criteria because it sets forth requirements to preserve existing aesthetic values of plant life. The applicant has committed to work with the County of San Bernardino Department of Community and Cultural Resources to develop a landscape/grading plan to screen views of the new structure from the future SART (MVPC 2000h p. 6.6-9c). With successful development and implementation of a Landscaping Plan that meets the County's requirements for mitigating potential impacts to local roads, residences, and the SART, the proposed project would be in compliance with the County's General Plan and Development Code Section 85.

Finally, Section 97.0401 and Section 97.0405 of the Development Code provide height requirements and procedures for increasing height limits for institutional structures. If the City of Redlands does not annex the project site, the applicant would need to obtain a variance for stack and structure heights.

Therefore, with successful implementation of the applicant's commitments and mitigation measures presented in the AFC, as augmented by staff's recommended measures and conditions presented below, the proposed project would be consistent with the County of San Bernardino's LORS.

### ***CITY OF REDLANDS***

The applicant has committed to working with the City in the preparation of a development plan that complies with historic and scenic conservation requirements, preserves vegetation, and preserves existing historic and architecturally views (MVPC 2000h, p. 6.6-9d). Successful implementation of these commitments would bring the proposed project into compliance with Section 3 of the General Plan. The project would also be compliant with Section 7 of the General Plan by resolving all issues and concerns regarding the adjacent Santa Ana River Trail.

The applicant has also committed to working with the City to prepare an adequate Landscaping Plan (which must also address fences, walls, and signs) to facilitate the review and approval process set forth in Municipal Code Section 18.168. Changes to Section 18.116.030 regarding building height requirements were approved at the April 18, 2000 City business meeting, allowing a height of 120 feet for non-nuclear electric generating stations and 225 feet for appurtenant structures such as cooling towers and emission stacks. The proposed project in its current configuration would comply with these height requirements. The applicant has also committed to working closely together with the City to mitigate any potentially adverse visual impacts from the proposed project (MVPC 2000h, p. 6.6-9d)

With successful implementation of the applicant's commitments and mitigation measures presented in the AFC as augmented by staff's recommended measures and conditions presented below, the proposed project would be consistent with the City of Redlands' LORS.

## MITIGATION

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### APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant has proposed four mitigation measures to be incorporated into the project design to minimize visual impacts associated with the operation of the facility:

**vis-1.** Where economically feasible, all new equipment and fencing will be constructed of materials that will restrict glare. The power plant structures and equipment will be finished with flat gray paint. Use of a flat finish will reduce the reflectivity of the surfaces and the color tone proposed will help the plant blend in with the middleground and background views.

**vis-2.** To the extent possible, Units 3 and 4 lighting at the power plant site will be shielded from public view.

**vis-3.** MVPC will comply with the applicable provisions of the County of San Bernardino and/or City of Redlands development guidelines for project features related to visual elements such as landscaping, building elevations, etc.

**vis-4.** MVPC will work with the County of San Bernardino Department of Community and Cultural Resources to develop a landscape/grading plan to screen views of the new structures from the future SART.

### ADDITIONAL MITIGATION

Energy Commission staff generally agrees with the applicant's proposals in regard to color, lighting, landscaping, and screening of project features. However, staff's position is that these proposals need to be more precisely developed in conditions of certification, which staff proposes below. In particular, the Conceptual Planting Plan (**VISUAL RESOURCES Figure 19**) presented in response to Data Request No. 158 will need to be reviewed by the County of San Bernardino Department of Community and Cultural Services for adequacy and appropriateness. Simulations of the tree plantings at one year and at maturity are provided as **VISUAL RESOURCES Figures 20 and 21** respectively. While the simulated plantings appear to mitigate the visual impact at KOP 4, specific issues remaining to be resolved include the adequacy of the planting corridor length and the appropriateness of the selected tree species.

It is conceivable that the 150-foot deep planting corridor may need to be extended beyond the applicant's property boundary (as shown in **PROJECT DESCRIPTION Figure 4**) in order to mitigate visual impacts to the SART further west and east of the project site. The extent of the necessary planting must be determined in consultation with the County's Department of Community and Cultural Services and Flood Control District, as well as the City of Redlands, as appropriate. Also, the appropriateness of planting evergreen eucalyptus trees in such close proximity to a riparian corridor would also need to be addressed by the County.

In addition, staff proposes two additional mitigation measures:

1. The project owner shall comply with City of Redlands' requirements regarding landscaping, fences, walls, and signs.
2. In consultation with the County's Department of Community and Cultural Services and Flood Control District, and the Palm Meadows Golf Course, the project owner shall develop a tree planting plan for the area immediately adjacent to the Palm Meadows Golf Course southern property boundary in the vicinity of the parking lot in order to partially screen views of the proposed project from the golf course clubhouse entry.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

The project as proposed has the potential to cause significant adverse visual impacts due to the visibility of the power plant facilities from the Palm Meadows Golf Course and the Santa Ana River Trail. However, it is expected that effective implementation of applicant's proposed mitigation measures, as modified, expanded, and augmented by staff's recommendations, will reduce the project's adverse and significant visual impacts to a level that is adverse but not significant. With the proposed mitigation as augmented by staff's recommendations, the project is also expected to be in compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

### **RECOMMENDATIONS**

The Energy Commission should adopt the following conditions of certification if it approves the project.

### **PROPOSED CONDITIONS OF CERTIFICATION**

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- VIS-1** Prior to first turbine roll, the project owner shall treat the project structures, buildings, and tanks in appropriate colors or hues that minimize visual intrusion and contrast by blending with the surrounding landscape, and shall treat those items in a non-reflective finish. A specific treatment plan will be developed for CEC approval to ensure that the proposed colors do not unduly contrast with the surrounding landscape colors. The plan will be submitted sufficiently early to ensure that any precolored buildings, structures, and linear facilities will have colors approved and included in bid specifications for such buildings or structures.

Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a list of each major project structure, building, and tank, specifying the color(s) proposed for each item;
- documentation that a non-reflective finish will be used on all project elements visible to the public;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit a revised plan to the CPM.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

**Verification:** At least 60 (sixty) days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than thirty (30) days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

**VIS-2** All fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

**Verification:** Prior to first turbine roll and at least 30 (thirty) days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

**VIS-3** Prior to first turbine roll, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;

- A lighting complaint resolution form (following the general format of that in Attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

**Verification:** At least 90 (ninety) days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection.

**VIS-4** The project owner shall provide landscaping and screening satisfactory to San Bernardino County and/or the City of Redlands.

**Protocol:** The project owner shall submit a landscaping plan to the CPM for review and approval. The submittal shall include evidence that the plan is satisfactory to the County's Department of Community and Cultural Services and Flood Control District, the Director of Planning for the City of Redlands, and the Palm Meadows Golf Course (for the proposed planting adjacent to the golf course parking lot).

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

**Verification:** Prior to first turbine roll and at least 60 (sixty) days prior to installing the landscaping, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 (seven) days after completing installation of the landscaping, that the landscaping is ready for inspection.

**VIS-6** The project owner shall comply with the City of Redlands' requirements regarding walls and signs.

Protocol: The project owner shall submit a plan for walls and signs for the project to the CPM for review and approval. The submittal shall include evidence that the plan is acceptable to the Director of Planning for the City of Redlands.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: Prior to first turbine roll and at least 60 (sixty) days prior to installing walls and signage, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 (seven) days after completing installation of the walls and signage that they are ready for inspection.

## REFERENCES

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Loyer, Joseph M. 2000. California Energy Commission. August 2, 2000 memorandum regarding visual plume modeling for Mountainview Power Project.

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ATTACHMENT 1

LIGHTING COMPLAINT RESOLUTION FORM

BLYTHE ENERGY PROJECT Riverside County, California	
Complainant's name and address:	
Phone number:	
Date complaint received:	
Time complaint received:	
Nature of lighting complaint:	
Definition of problem after investigation by plant personnel:	
Date complainant first contacted:	
Description of corrective measures taken:	
Complainant's signature: _____	Date: _____
Approximate installed cost of corrective measures: \$	
Date installation completed:	
Date first letter sent to complainant: _____ (copy attached)	
Date final letter sent to complainant: _____ (copy attached)	
This information is certified to be correct:	
Plant Manager's Signature: _____	

(Attach additional pages and supporting documentation, as required.)

## **VISUAL RESOURCES APPENDIX A**

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### **Visual Analysis Data Sheets for KOPs 1 through 4**

**(NOTE TO CEC:** A BLACK AND WHITE PHOTOCOPY (TWO PAGES) IS PROVIDED FOR EACH DATA SHEET. DATA SHEETS ARE IN PAGEMAKER AND REQUIRE THE PLACEMENT OF A SMALL 2.5" X 4" PHOTO (EXISTING VIEW) INTO THE FIRST PAGE OF EACH DATA SHEET WHERE SHOWN. PAGEMAKER FILES ARE PROVIDED ON THE ENCLOSED MAC-FORMATTED ZIP DISK. SEE BLYTHE SUBMITTAL FOR EXAMPLES.)

## KOP 1 DATA SHEET (FRONT)

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PRINT DATA SHEETS FRONT TO BACK (DOUBLE-SIDED)

**KOP 1 DATA SHEET (BACK)**

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## **KOP 2 DATA SHEET (FRONT)**

---

PRINT DATA SHEETS FRONT TO BACK (DOUBLE-SIDED)

**KOP 2 DATA SHEET (BACK)**

---

## KOP 3 DATA SHEET (Front)

---

PRINT DATA SHEETS FRONT TO BACK (DOUBLE-SIDED)

**KOP 3 DATA SHEET (BACK)**

---

## **KOP 4 DATA SHEET (Front)**

---

PRINT DATA SHEETS FRONT TO BACK (DOUBLE-SIDED)

**KOP 4 DATA SHEET (BACK)**

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## **VISUAL RESOURCES APPENDIX B**

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### **Visual Resources Figures 1 through 21**

## **VISUAL RESOURCES Figure 1**

### **Power Plant Site Visibility Map**

Source: MVPC \_\_\_\_, Figure 6.6-1

#### **CEC Preparation Instructions**

17. Change the square symbol legend from description from *Visual Setting Photograph* to **Key Observation Points**.
18. On the map, delete all numbered square symbols except 1, 5, and 8 and renumber as follows: Change 1 to 4; change 5 to 3; and change 8 to 1.
19. Add a new box symbol numbered 2 where shown in red on the map.
20. Add 4 lettered circular symbols to the map where shown and draw arrows similar to box symbols in the directions shown
21. Add the four lettered circular symbols to the map legend and label them with the *italicized* text below (don't italicize) Note: view directions and notes below are additional graphics guidance only, don't include in legend:

#### **Additional Residential Views:**

- A – See *Visual Resources Figure 2* (CEC - view direction is due east);
- B – See *Visual Resources Figure 3* (CEC - view direction is toward plant site);
- C – See *Visual Resources Figure 4* (CEC - view direction is northeast) **Note: Location “C” is at the same location as the number “9” box symbol;** and
- D – See *Visual Resources Figure 5* (CEC – view direction is toward the plant site).

## **VISUAL RESOURCES Figure 2**

Existing view from the west side of Mountain View Avenue toward the existing power plant. From this location, the proposed facilities would be partially screened by the existing facilities.

Source: MVPC \_\_\_\_

### **CEC Preparation Instructions**

1. Figure 2 is applicant's "View 7"

### **VISUAL RESOURCES Figure 3**

Existing view toward the power plant from the south side of San Bernardino Avenue, just west of Mountain View Avenue. From this location, the proposed facilities would be screened by vegetation along San Bernardino and Mountain View Avenues and the existing facilities.

Source: MVPC \_\_\_\_,

### **CEC Preparation Instructions**

1. Figure 3 is applicant's "View 10"

#### **VISUAL RESOURCES Figure 4**

Existing view toward the power plant from the southwest corner of the intersection of San Bernardino and Mountain View Avenues. From this location, the proposed facilities would be partially screened by vegetation along Mountain View Avenue and the existing facilities.

Source: MVPC \_\_\_\_,

#### **CEC Preparation Instructions**

1. Figure 4 is applicant's "View 11"

### **VISUAL RESOURCES Figure 5**

Existing view toward the power plant from the southwest corner of the intersection of Victoria and Mountain View Avenues. From this location, the proposed facilities would be partially screened by vegetation along Mountain View Avenue and the existing facilities.

Source: MVPC \_\_\_\_\_,

### **CEC Preparation Instructions**

1. Figure 5 is applicant's "View 24"

**VISUAL RESOURCES Figure 6**  
Linear facility photograph locations.

Source: MVPC \_\_\_\_,

**CEC Preparation Instructions**

Crop (horizontally), cut, and add match line to fit as two parallel strips on an 11x17 sheet.

Re-label photo location legend as: Photo *Location and Direction*.

From west to east, Adjust map photo locations as follows:

- 115a: Delete this location
  - 115d: Change this to *Figure 7*
  - 115f: Change this to *Figure 8*
  - 103e: Change this to *Figure 9*
  - 115b Change this to *Figure 10*
  - 115c: Change this to *Figure 11*
  - 105a: Change this to *Figure 14*
  - 104a: Delete this location
  - 104e: Delete this location
  - 104c: Change this to *Figure 13*
  - 104d: Change this to *Figure 12*
  - 104b: Delete this location
4. 115g (Arial) Delete this location

### **VISUAL RESOURCES Figure 7**

View of the proposed gas pipeline route along Arrow Route, looking east, west of the intersection of Pecan Avenue and Arrow Route.

Source: MVPC \_\_\_\_, Figure VIS-115d

### **VISUAL RESOURCES Figure 8**

View of the proposed gas pipeline route along Merrill Avenue, looking east from the intersection of Merrill Avenue and Beech Avenue.

Source: MVPC \_\_\_\_, Figure VIS-115f

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 7 and 8 onto one 8 1/2 x 11-inch sheet

### **VISUAL RESOURCES Figure 9**

View of the proposed gas pipeline route where it spans the wash adjacent to the railroad tracks at the Mill Street railroad overcrossing, looking east. There is an existing pipeline that presently spans the wash in a similar fashion to that of the proposed project.

Source: MVPC \_\_\_\_, Figure VIS-103a

### **VISUAL RESOURCES Figure 10**

View of the proposed gas pipeline route along Mill Street, looking east, from the intersection of Mill and I Streets. The concrete span over Mill Street is Interstate 215.

Source: MVPC \_\_\_\_, Figure VIS-115b

### **VISUAL RESOURCES Figure 11**

View of the proposed gas pipeline route along Mill Street, looking east from the intersection of Mill and H streets.

Source: MVPC \_\_\_\_, Figure VIS-115c

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 10 and 11 onto one 8 1/2 x 11-inch sheet

### **VISUAL RESOURCES Figure 12**

View of the Santa Ana River Wash and the Tippecanoe overpass from the northeast end, viewing to the southwest. The proposed gas pipeline route would be buried beneath the wash on either side of the overpass.

Source: MVPC \_\_\_\_, Figure VIS-104d

### **VISUAL RESOURCES Figure 13**

View of the Santa Ana River Wash and the Tippecanoe overpass from the southwest end, viewing to the northeast. The proposed gas pipeline route would be buried beneath the wash on either side of the overpass.

Source: MVPC \_\_\_\_, Figure VIS-104c

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 12 and 13 onto one 8 1/2 x 11-inch sheet

#### **VISUAL RESOURCES Figure 14**

View of the Twin Creek Channel golf cart bridge crossing. The proposed wastewater discharge pipeline connection would be suspended from the bridge. The golf course is generally located beneath the level of the bridge.

Source: MVPC \_\_\_\_, Figure VIS-105a

### **VISUAL RESOURCES Figure 15A**

The **existing view** to the north from Key Observation Point 1, located on the south side of Lugonia Avenue, adjacent to five residences.

### **VISUAL RESOURCES Figure 15B**

The same view showing a **photosimulation** of the Mountainview Power Plant Project.

Source: MVPC \_\_\_\_

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 15A and 15B onto one 11 x 17-inch sheet. Source image for Figure 15A is applicant's 36-inch long *Before View of KOP 1*. Source image for Figure 15B is applicant's 36-inch long *After View of KOP 1*.
2. See Blythe submittal for examples of the pairing of existing photos and simulations. Final image sizes are 4.25 high by 15.25 long
3. Do not scale images down. Crop only. Scaling down would eliminate "life size" perspective. Approximate horizontal view area is illustrated in attached 11 x 17 photocopy. All images are to be in color.

### **VISUAL RESOURCES Figure 16A**

The **existing view** to the southeast from Key Observation Point 2, located at the entrance to the Palm Meadows Golf Course Clubhouse.

### **VISUAL RESOURCES Figure 16B**

The same view showing a **photosimulation** of the Mountainview Power Plant Project.

Source: MVPC \_\_\_\_

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 16A and 16B onto one 11 x 17-inch sheet. Source image for Figure 16A is applicant's 36-inch long *Before View of KOP 2*. Source image for Figure 16B is applicant's 36-inch long *After View of KOP 2*.
2. See Blythe submittal for examples of the pairing of existing photos and simulations. Final image sizes are 4.25 high by 15.25 long
3. Do not scale images down. Crop only. Scaling down would eliminate "life size" perspective. Approximate horizontal view area is illustrated in attached 11 x 17 photocopy. All images are to be in color.

### **VISUAL RESOURCES Figure 17A**

The **existing view** to the west-northwest from Key Observation Point 3, located at the intersection of San Bernardino and California Avenues.

### **VISUAL RESOURCES Figure 17B**

The same view showing a **photosimulation** of the Mountainview Power Plant Project.

Source: MVPC \_\_\_\_

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 17A and 17B onto one 11 x 17-inch sheet. Source image for Figure 17A is applicant's 36-inch long *Before View of KOP 3*. Source image for Figure 17B is applicant's 36-inch long *After View of KOP 3*.
2. See Blythe submittal for examples of the pairing of existing photos and simulations. Final image sizes are 4.25 high by 15.25 long
3. Do not scale images down. Crop only. Scaling down would eliminate "life size" perspective. Approximate horizontal view area is illustrated in attached 11 x 17 photocopy. All images are to be in color.

### **VISUAL RESOURCES Figure 18A**

The **existing view** to the southwest from Key Observation Point 4, located on the Santa Ana River Trail.

### **VISUAL RESOURCES Figure 18B**

The same view showing a **photosimulation** of the Mountainview Power Plant Project.

Source: MVPC \_\_\_\_

### **CEC Preparation Instructions**

1. Crop as necessary to batch Figures 18A and 18B onto one 11 x 17-inch sheet. Source image for Figure 18A is applicant's 36-inch long *Before View of KOP 4*. Source image for Figure 18B is applicant's 36-inch long *After View of KOP 4*.
2. See Blythe submittal for examples of the pairing of existing photos and simulations. Final image sizes are 4.25 high by 15.25 long
3. Do not scale images down. Crop only. Scaling down would eliminate "life size" perspective. Approximate horizontal view area is illustrated in attached 11 x 17 photocopy. All images are to be in color.

**VISUAL RESOURCES Figure 19**  
KOP No. 4 Conceptual Planting Plan

Source: MVPC 2000II

**CEC Preparation Instructions**

1. Reproduce this 11 x 17" black and white drawing as a black and white 11 x 17" graphic.

**VISUAL RESOURCES Figure 20**  
KOP No. 4 Tree Planting at 1 Year

Source: MVPC 2000II

**CEC Preparation Instructions**

1. Crop this oversize color image to an 11 x 17" color graphic. Center the image on the planted area illustrated in the simulation.

**VISUAL RESOURCES Figure 21**  
KOP No. 4 Tree Planting at Maturity

Source: MVPC 2000II

**CEC Preparation Instructions**

1. Crop this oversize color image to an 11 x 17" color graphic. Center the image on the planted area illustrated in the simulation.



# CULTURAL RESOURCES

Jeanette A. McKenna and Dorothy Torres

## INTRODUCTION

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This analysis discusses cultural resources, which are defined as the structural and cultural evidence of the history of human development and life on earth. Evidence of California's early occupation is becoming increasingly vulnerable due to the ongoing development and urbanization of the state.

Cultural resource materials are found throughout California: along the ocean coastline and on coastal islands; along rivers and streams; in coastal and inland valleys and lowlands; throughout the coastal and inland mountain ranges; and throughout the interior deserts. Cultural resources may be found on the surface or in buried contexts beneath the surface. In some areas of the state, a sequence of settlements may be represented in multiple layers of cultural resources within the same site. In other areas, the distribution of cultural materials may be much more dispersed and seemingly unrelated.

Cultural resources are significant to our understanding of our culture our history and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resource site and the surface environmental resources and features, and the analysis of the locational context of the resource materials within the site and beneath the surface. These relationships provide information that can be used to piece together the sequence of human occupation and use of an area, and they begin to create a picture of the former inhabitants and their environment.

Staff's primary concerns in its cultural resource analysis are to ensure that all potential impacts are identified and that conditions are set forth that ensure no significant adverse impacts will occur. The determination of potential impacts to cultural resources from the proposed Mountainview Power Plant (MVPP) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Three aspects of cultural resources are addressed in staff's analysis: prehistoric archaeological resources, historic archaeological resources, and ethnographic resources.

Prehistoric archaeological resources are those resources relating to prehistoric human occupation and use of an area; these resources may include sites and deposits, structures, artifacts, rock art, trails, and/or any other traces of Native American human behavior. In California, the prehistoric period has been determined to pre-date 10,000 years before present (B.P.) and which extended well into the 18<sup>th</sup> century with the initiation of the Mission Period (ca. 1769) and the first Euro-American (Spanish) settlement of California.

Historic archaeological resources are those materials usually associated with Euro-American exploration and settlement and the beginning of written historical records.

Historic resources may also include archaeological deposits, sites, structures, traveled ways, artifacts, documents, and/or any other evidence of human activity. Prior to 1998, federal and state requirements identified historic resources as being greater than fifty years of age. Amendments to CEQA have removed the references to the fifty-year designation, while the federal regulations maintain the requirement.

Ethnographic resources are those resources important to the heritage of a particular ethnic or cultural group, such as Native Americans, Hawaiian, Eskimo, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures. Ethnographic resources also include personal biographical data, interview data, and collections or oral histories relating the lifeways of previous generations.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

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Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, § 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws.

### **FEDERAL**

National Environmental Policy Act (NEPA): Title 42, United States code, § 4321-et seq. requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.

Federal Register 44739-44738, 190 (September 30, 1983): Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.

National Historic Preservation Act, 16 United States Code 470, commonly referred to as § 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et seq.) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are

used by federal, state, and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources. Recent revisions to § 106 in 1999 emphasized the importance of Native American consultation.

Executive Order 11593, "Protection of the Cultural Environment," May 13, 1971, (36 Federal Register 8921) orders the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.

American Indian Religious Freedom Act; Title 42, United States Code, § 1996 protects Native American religious practices, ethnic heritage sites, and land uses.

Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code § 3001, et seq. Defines "cultural items", "sacred objects", and "objects of cultural patrimony"; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.

## **STATE**

Public Resources Code, § 5020.1 defines several terms, including the following:

(j) "historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

(q) "substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

Public Resources Code, § 5024.1 establishes a California Register of Historic Places; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.

Public Resources Code, § 5097.5 states that any unauthorized removal or destruction of archaeological or paleontological resources on sites located on public land is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

Public Resources Code, § 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.

Public Resources Code, § 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.

Public Resources Code, § 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.

Public Resources Code, § 21000, et seq, California Environmental Quality Act (CEQA) This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.

Public Resources Code, § 21083.2 states that if a project may affect a resource that has not met the definition of an historical resource set forth in § 21084, then the lead agency may determine whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can not be avoided mitigation measures shall be required. The law also discusses excavation as mitigation; discussed the costs of mitigation for several types of projects; sets time frames for excavation; defines “unique and non-unique archaeological resources; provides for mitigation of unexpected resources; and sets financial limitations for this section.

Public Resources Code, § 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historic resource” and describes what constitutes a “significant” historic resource.

CEQA guidelines, Title 14 California Code of Regulations, § 15126.4 “Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects” sub-section (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) also discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

CEQA Guidelines, Title 14, California Code of Regulation, § 15064.5 “Determining the Significance of Impacts to Archaeological and Historical Resources”. Subsection (a) defines the term “historical resources.” Subsection (b) explains when a project may be deemed to have a significant effect on historic resources and defines terms used in describing those situations. Subsection (c) describes CEQAs’ applicability to archaeological sites and provides a bridge between the application of the terms “historic” resources and a “unique” archaeological resource.”

CEQA Guidelines, Title 14 California Code of Regulations, § 15064.7 “Thresholds of Significance.” This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term “cumulatively significant.”

CEQA Guidelines, Appendix "G" Issue V: Cultural Resources. Lists four questions to be answered in determining the potential for a project to impact archaeological, historic, and paleontologic resources.

California Penal Code, § 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.

California Health and Safety Code, § 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.

Public Resources Code, § 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the "Most Likely Descendant" to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.

## **LOCAL**

Although the Energy Commission has pre-emptive authority, it typically ensures compliance with local laws, ordinances, regulation, standards, plans, and policies. The General Plans of the County of San Bernardino and the Cities of San Bernardino, Redlands, Rialto, Highland and Fontana are addressed below because the project site would involve linear right-of-ways outside the plant location and within these cities (MVPP 2000a).

### ***SAN BERNARDINO COUNTY***

The County of San Bernardino defines three types of resources, natural (paleontological), archaeological and historic resources. Each type of resource deserves special protection for future generations (SBCGP 1989:II-C2-5).

Archaeological resources may be prehistoric or historic and may occur in the same location. Archaeological resources are the physical remains of past human activities and can include artifacts, refuse, and/or features in both surface and subsurface contexts. In San Bernardino County, archaeological resources are defined as being 100 years old or more and do not include standing structures (SBCGP 1989: II-C2-1).

Historic resources include standing structures of any type that are 50 years of age or older. Sometimes referred to as the "built environment", these resources may include houses or other structures, irrigation systems, engineering features, or any other resource identified as man-made (SBCGP 1989: II-C2-2).

The County regards heritage resources as important for a number of reasons but primarily because of their potential scientific value and/or cultural and historical values. Such resources provide a sense of place that defines and distinguishes San Bernardino County from all other communities.

### ***CITY OF SAN BERNARDINO***

The General Plan for the City of San Bernardino provides the basis for enabling legislation that will allow the City of San Bernardino to effectively preserve, enhance

and maintain sites and structures which have been deemed architecturally, historically, archaeologically and/or culturally significant. These efforts are important to San Bernardino because older structures and historic sites may be threatened with demolition or removal as the rapid pace of development and redevelopment continues. The authorization for such measures is presented in § 65303 of the Government Code and states:

“Any other elements or address any other subjects which, in the judgment of the legislative body, relate to the physical development of the county or city.”

The expressed goals of the City of San Bernardino (SBGP n.d.:3-31) are:

“To protect, preserve, and restore the sites, structure and districts which have architectural, historical, archaeological and/or cultural significance to the City of San Bernardino and surrounding area, while promoting community awareness and appreciation of the areas diverse cultural heritage.”

To meet these goals, the City of San Bernardino has defined the following objectives:

Develop a comprehensive Historic Preservation Plan that will ensure that the area's historically significant resources are protected in a manner that preserves and/or enhances the resource's inherent historic value(s);

Provide incentives to private owners of historic resources to maintain and/or enhance their properties in a manner that will conserve the integrity of such resources in the best possible condition;

Promote community appreciation for the unique history of the San Bernardino area and community involvement in its retention and preservation;

Minimize the displacement of the economically disadvantaged from designated areas of historical significance;

Protect and enhance historic, architectural, or cultural resources in commercial and redevelopment areas in a manner that will encourage revitalization and investment in these areas; and,

6. Protect and minimize disruption of the City's archaeological resources.

## ***CITY OF REDLANDS***

The City of Redlands consists of seven divisions: North Redlands, Mentone, Crafton, South Redlands, San Timoteo/Live Oaks Canyons, West Redlands, and Northwest Redlands. Each of these has its own particular historic and development background. Nonetheless, the overall historic preservation ordinance for the City is consistent and presents the goals and policies for such preservation of resources.

Citing the City of Redlands' General Plan (1996, Section 3.0, Design-9), City Design and Preservation Element:

The City of Redlands and its citizens have long been concerned with the preservation of Redlands' architectural, historic, cultural, archaeological and scenic resources, referred to here as 'historic resources.' In the early seventies, Redlands began taking an inventory of its historic structures. In 1976, Redlands received a State grant to survey historic properties, documenting 568 historic properties. A Historic and Scenic Preservation Commission was established in 1976 to advise the City Council regarding designation and protection of historic resources., In 1985, the first Historic and Scenic preservation Element of the General Plan was prepared and adopted. An ordinance adopted in 1986 strengthened the protection of resources by allowing the Commission to deny demolition, except in cases of proven hardship, and to designate without owner consent.

### ***CITY OF RIALTO***

The City of Rialto states "...[S]aving the past can be a way of learning for the future, just as people change themselves by learning something now that they may employ later" (RGP n.d.:IX-1). In their historic resource element of the General Plan, the City of Rialto identifies archaeological resources, historic archaeological resources and historic resources as significant resources. Their goals include:

Encourage public understanding and involvement in the unique heritage of the City of Rialto;

All significant archaeological resources in Rialto shall be surveyed, recorded and, where feasible, protected;

All significant historic archaeological resources within Rialto shall be surveyed, recorded and, where feasible, protected;

Preserve Rialto's significant historic resources as a source of community identity, stability, aesthetic character, and socio-economic value.

### ***CITY OF HIGHLAND***

The City of Highland General Plan and Historic and Cultural Preservation Element emphasizes that the character and history of the City are reflected in its cultural, historical, and architectural heritage (HGP 1994:8-1). As such the "foundations" of the City should be preserved as "... living parts of community life ... to build an understanding of the City's past, so that future generations may have a genuine opportunity to appreciate, enjoy, and understand the rich heritage of the City ...". The City of Highland adopted the guidelines of the National Historic Preservation Act of 1966 as a means of identifying and protecting their resources. The City's goals include:

To safeguard the City's unique cultural heritage as embodied and reflected in the City's architectural history and patterns of cultural development;

To encourage and facilitate public knowledge, understanding, and appreciation of the City's historic past and unique sense of place;

To preserve diverse architectural styles, patterns of development, and design preferences reflecting phases of the City's history and to encourage complementary contemporary design and construction and inspire a more livable urban environment;

To enhance property values and to increase economic and financial benefits to the City and its inhabitants through the exploration of creative financial incentives for preservation;

To protect and enhance the City's attraction to tourists and visitors thereby stimulating business and industry;

To identify as early as possible and resolve conflicts between the preservation and cultural resources and alternative land uses;

To integrate the preservation of cultural resources into public and private land use management and development processes;

To stabilize neighborhoods through the preservation of cultural resources and establishment of historic districts and conservation zones;

To encourage public participation in identifying and preserving historical and architectural resources thereby increasing community pride in the City's cultural heritage.

### ***CITY OF FONTANA***

The City of Fontana General Plan states that "...[C]ultural resources can provide a sense of place, a history, and a sense of pride for residents of a region. Cultural resources within the planning area can be divided into three types, Archaeological; Historical, and Contemporary Cultural Resources" (FGP n.d.: Conservation Element, p. 10).

In general, the City of Fontana's plan for the protection of cultural resources defers to the CEQA guidelines and provides no additional policies or guidelines to supplement the CEQA criteria.

## **ENVIRONMENTAL SETTING**

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### **REGIONAL DESCRIPTION**

In general, the setting for the project area is characterized as a Desert Sage Scrub habitat which, in its natural context, contained numerous perennial water courses, a variety of raw lithic material types (in the form of river cobbles), and, during the historic periods of occupation, provided ample resources for the successful establishment of both citrus fruit orchards and olive orchards (see Hatheway and

McKenna 1987; McKenna 1993 and 1995a-c). Citing Harding Lawson Associates (1987), the project area is basically flat with a slight southerly slope. The surface of the area is covered with a silts soil a “minor” amount of gravel and boulders (AAKO Geotechnical Engineering Consultants (1986). Recent studies indicate that there is up to 900 feet of recent alluvial soils beneath the current surface of the project area and the surrounding Lytle Creek/Santa Ana River drainage system (Department of Water Resources 1970; San Bernardino County Flood Control District 1987).

## **PROJECT VICINITY DESCRIPTION**

The Mountainview Power Plant project area involves acreage within the City of San Bernardino, Rialto, Redlands, Fontana, and the Etiwanda area of San Bernardino County. The property also borders the City of Highland located east of San Bernardino. The project area involves property along the Santa Ana River from the area west of City Creek to Etiwanda Creek (south of Lytle Creek).

Refer to the **PROJECT DESCRIPTION** section of this Staff Analysis for additional information and maps of the project development region and the project area.

## **PREHISTORIC SETTING**

The majority of Southern California was inhabited, at one time or another over the past 10,000 + years, by prehistoric Native Americans. The Lytle Creek/Cajon Pass, Fontana, Rialto, San Bernardino, and Highland areas of San Bernardino County were no exceptions. To summarize the prehistoric occupation of this area, the project area is well within the boundaries of the much discussed and cited chronologies for Southern California, specifically those of Warren (1968) and Wallace (1955). This particular area of Southern California is associated with the ancestors of the historic Serrano and peripheral groups referred to as the Gabrieleno and/or Luiseno. Appellations, such as Luiseno and Gabrieleno refer to historical associations with the Spanish Missions of San Luis Rey and San Gabriel, respectively. The reference to “Serrano” relates to the people inhabiting the mountain areas to the northwest and northeast.

## **ETHNOGRAPHIC BACKGROUND**

Seasonal migrations of these various populations make delineation of their traditional territories difficult to define. The location of the project area (northern Fontana) suggests a likely association with the Gabrielenos (from the valleys) and Serranos (mountain people) as defined by Altschul et. al. (1984), Strong (1929), Kroeber (1925, 1976), Bean et. al. (1981), and Whitehead (1978). Due to distance from the source, the area is not considered overly sensitive for prehistoric resources.

## **HISTORIC SETTING**

Spanish missionaries began their exploration and development of the missions in California in 1769 starting in San Diego and ending with the missions in San Rafael and Sonoma, in 1823. The Spanish period extended from 1760 to 1821; the Mexican Period from 1821 to 1848; and the American Period began in 1848.

With respect to the history of the area, Michael White was one of the original Anglo traders who accompanied Jedediah Smith during the 1830s and who opted to remain in California in 1840. Having befriended the Lugo family (of the Rancho San Bernardino), White was accepted as a member of the Mexican communities of the San Bernardino valley (Whitehead 1978: 295) and was eventually granted the Rancho de Muscupiabe (northeast of the current project area) by Governor Manuel Micheltoreno in 1843. Avina (1932:74) notes that the Rancho de Muscupiabe consisted of a single square league granted to Miguel Blanco (Michael White) in 1843. The Lugo's sold the majority of the Rancho San Bernardino to Mormon settlers who eventually spread across the valley to the Cajon Pass, introducing irrigation systems and agriculture to the predominantly ranching lands (Beck and Haase 1977:38). In addition, vast acreage located to the south and west of San Bernardino (and Muscupiabe) and in the vicinity of Lytle Creek and the Cajon Pass became U.S. Government owned lands available for homesteading in the 1860s).

The establishment of the Southern Pacific Railroad in 1875 and the Santa Fe Railroad in 1887 made the San Bernardino valley a more valuable agricultural entity in San Bernardino County.

## **RESOURCES INVENTORY**

### ***LITERATURE AND RECORDS SEARCH***

An archaeological literature and records search was completed through the San Bernardino County Museum Archaeological Information Center, Redlands, the local repository for all reports, site records, and maps maintained under the California Historical Resources Information System (CHRIS). An arbitrary Area of Potential Effect (APE) of one half mile surrounding the plant site and various alignments was assigned by the cultural resources consultants (MVPC 2000a:4). A supplemental records search was completed when the proposed project area was amended.

Results of the literature and records search showed that a minimum of 41 studies have been completed within the one-half mile APE. Another 11 general overviews have been completed to address this particular portion of San Bernardino County. These studies resulted in the identification of prehistoric archaeological resources, historic archaeological resources, and historic resources (MVPC 2000k:31). Only 14 of the identified resources were found to be within the area of direct impact. With the abandonment of the proposed Foothill Boulevard alignment, one of these sites is avoided (National Old Trails Highway). Each of the thirteen remaining resources is of historic origin and not associated with any Native American resources. The applicant also withdrew Natural Gas Line Route 3 from consideration. There were four potential historic resources located on this route. Of the five resources still on a preferred route, two have been identified as significant resources and four are considered "resources that may exist", but were not specifically located during the field studies. These four resources may be affected during any grading or excavations associated with the proposed power plant facilities.

## **FIELD SURVEYS**

Field investigations involved three separate activities that required differing approaches: 1) confirmation of areas under pavement; 2) a pedestrian survey of the proposed wastewater alignments (various alternatives); and 3) pedestrian surveys of the construction areas (MVPC 2000k:4-5).

The proposed pipeline will be buried beneath existing pavement. To survey the line and its alternates, a drive over inspection was made, stopping in accessible areas where the ground surface was exposed, walking over these areas, and performing a visual inspection noting soil types, disturbances, or other features related to cultural resources. General inspection of the lines were made first to estimate the width of the highway relative to the proposed fifty foot easement, and second to verify that all segments of the line were paved.

Second, two proposed wastewater transmission lines were inspected. In the eastern portion of the project area at the MVPC facility, effluent from the plant will follow an existing line. The tie in point was inspected on the ground and a drive over inspection was made of the existing lines at a golf course location along Warm Creek. There, a walk over survey was performed along the creek banks and the two tie in locations were examined.

Third, four construction staging areas proposed within the confines of the MVPC property or adjacent to it were surveyed. With bare ground conditions and excellent surface visibility, walk over inspections of these areas were made, noting ground disturbances, soil types, topography and other conditions pertinent to cultural resource identification and evaluation. Also noted were the locations of plant facilities relative to the construction staging areas. Field notes were made throughout the investigation.

## **ARCHITECTURAL RECONNAISSANCE**

During the cultural resources surveys, the project team did not observe any potentially significant historic buildings or structures within the proposed area of direct impact (plant site, transmission alignments, etc.). However, there are properties in the vicinity of the project that may have historic importance. The known significance of the Mormon Mill, the Gage Canal, etc. are examples of such resources.

Staff requested an evaluation of the resources that might be impacted by the project. In response to this request, the applicant's consultant conducted additional inspections of thirteen sites located within the APE. After removing sites that were located on Natural Gas Line Routes 2 and 3 from consideration, it appears that the project has the potential to affect six sites. Detailed information concerning the inspections and evaluation is provided in the Impacts section of this SA (MVPC 2000II).

## ***NATIVE AMERICAN CONTACTS***

The Native American Heritage Commission was contacted in March, 2000, and requested to provide any and all data pertaining to Native American sacred or religious sites within or near the project area (MVPC 2000k). A response in early April, 2000, stated that the Native American Heritage Commission had no records of any such resources and instructed Applied Earthworks to contact recognized Native Americans in the area to insure no such resources would be impacted. A brief listing of Native American contacts was provided.

Subsequently, Applied Earthworks contacted five individuals, including: Mary Ann Andreas (Morongo); Ernest Salas (Gabrielino); Henry Duro (Serrano); Christine Hernandez (Serrano); and Katherine Saubel (Cahuilla). Responses were received from Katherine Saubel (making a referral to the Serrano in Highland - Henry Duro) and Lowell J. Bean (ethnographer and Anthropologist). No significant sites were identified by any of the groups contacted.

## ***SUMMARY OF PREVIOUSLY IDENTIFIED CULTURAL RESOURCES IN THE PROJECT VICINITY***

Only 13 known cultural resources were identified within the area of direct impact. Of these, all are historic in origin (MVPC 2000k:33). Of the 13 resources, two have been identified as significant resources; one has been identified as an insignificant resource and the remaining ten have been referred to as "resources that may exist", but were not specifically located during the field studies. Resources may be identified during any grading or excavations associated with the proposed power plant facilities. The thirteen resources originally identified as potentially affected by the project include the following:

P-1074-61H	Historic Road	Not Located
P-1074-88H	Vivienda Water Company	Not Located
P-1074-28H	Water Transportation System	Not Located
P-1074-93H	Daley Ditch	Not Located
P-1074-92H	Davis Mill Ditch	Not Located
P-1074-119H	Raynor Springs Ditch	Not Located
PSBR-26H	North Fork Ditch	Not Located
PSBR-85H	Water Transportation Site	Not Located
PSBR-4H	Sawpit Canyon Road	Not Located
CPHI- 63	Mormon Flour Mill Site	Not Located
CA-SBR-7099H	Sewer System	Insignificant Resource
CA-SBR-6847H	AT& SF Railroad Grade	Significant Resource
CA-SBR-7168H	Gage Canal	Significant Resource

After Natural Gas Lines Routes 2 and 3 were withdrawn from consideration, it appear that only six historic resources may be affected by the project.

At this time, only two resources have been identified, within the project area of impact, that have above surface components. These two resources have been

determined to be significant and, therefore, impacts would be considered significant (see above). These sites include the AT&SF Railroad Grade and the Gage Canal.

## **IMPACTS**

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Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed MVPC project has the potential to adversely affect both known and unknown cultural resources. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, or excavation. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur. In addition, the potential for discovery does not measure the significance of individual artifacts or other cultural resources present, since it is impossible to accurately predict what specific materials could be encountered. Furthermore, sometimes the full significance of discovered cultural resources can only be determined as a result of formal professional evaluation by a qualified archaeological consultant.

## **POTENTIAL FOR PROJECT IMPACTS**

Because project-related site development and construction would entail sub-surface disturbance of the ground, the proposed project has the potential to adversely affect previously unknown cultural resources. Three archaeological sites, features, or objects are known to be located within one-half mile of the proposed project area. Another ten resources have been indicated through historic research. These sites are all historic in origin and represent a variety of resource types. The proposed site area is considered moderately to highly sensitive for additional resources.

### ***POWER PLANT SITE***

The proposed power plant location yielded no physical evidence of cultural resources. Nonetheless, the location is associated with the Santa Ana River floodplain and associated with the alluvial deposits from the eroding San Bernardino Mountains. There is a potential for buried deposits within this property and the area should be considered moderately sensitive for such resources (MVPC:2000k).

## ***TRANSMISSION LINE ALIGNMENT***

No new transmission lines will be built. The project will connect to the SCE owned 230kV switchyard adjacent to the plant (MVPC 2000a:2-2).

## ***PROPOSED NATURAL GAS LINE***

The 17-mile long proposed natural gas line is primarily located along Mill Street/Merrill Avenue, Arrow Route Highway, and Tippecanoe Avenue and would be 24 to 30 inches wide. Running between the Santa Ana River/Warm Creek area and Etiwanda Creek, this alignment is along historic roadways and crosses both the Gage canal alignment and the AT&SF Railroad Grade (at Cherry Avenue). As such, this alignment will have a potentially adverse impact on two known and recorded significant resources. Avoidance as mitigation, is required by both state and local law, if feasible.

Additional research and a cursory inspection were performed by the applicant's consultant to determine whether there was above surface evidence of any of the resources identified within the project APE.

There was no above ground evidence of the following sites: P1074-28H Water Transportation, P1074-88H Vivienda Water Company, PSBR-26H North Fork Ditch, PBSR-85H Water Transportation. Previously recorded information regarding these resources indicates that they are potentially significant and should be treated as significant, if their location is confirmed during ground disturbance.

Sites SBR-6847H AT&SF Railroad Grade and SBR-7168H Gage Canal were identified as significant and as having above ground components. The techniques of spanning above the resources or drilling under them will be used to mitigate potential impacts (MVPC 2000II: Tab 11 and 13). Cultural Resources Monitoring will also be required in the vicinity of the resources to mitigate any affects.

## ***ALTERNATE NATURAL GAS LINES***

Alternate Routes 2 and 3 were removed from consideration by the applicant.

## ***WASTEWATER PIPELINE ALIGNMENT***

There are two wastewater pipelines under consideration. The effluent line alignment under consideration runs 2.3 miles from the existing plant site, along San Bernardino Avenue to Nevada Street, and north on Nevada Street to an existing system. The wastewater discharge line connection would be approximately 1,100 feet in length, running from the project site and connecting to an existing system, the Santa Ana Regional Interceptor (SARI) discharge line. Neither of these alignments will result in adverse impacts to known resources. Therefore, no avoidance measures are necessary.

## **CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES**

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the

analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed by a qualified researcher as “important” or “significant” in accordance with federal guidelines need to be considered regarding potential impacts. The significance of historical and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4. If such resources are determined to be significant, and therefore eligible for listing in the National Register, as well as the California Register, they are afforded certain protection under the National Historic Preservation Act and/or CEQA.

The National Register criteria state that “eligible historic properties” are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or (d) that have yielded, or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria. California has adopted a very similar set of criteria for assessing resources of statewide importance.

Under federal law, resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further protection. However, occasionally certain resources, although they may not be assessed as “significant,” may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. Staff evaluates the survey reports and site records for any known resources located within or adjacent to the project APE to determine whether they meet the eligibility criteria.

The record and literature search and the walking surveys of the proposed project APE were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, additional evaluation would be conducted to determine whether the resources are already listed on, or are potentially eligible for listing on, either the National Register of Historic Places (National Register) [36 CFR 800] or the California Register of Historic Resources. The determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act.

Beginning in 1999, the California State Resources Agency adopted considerable revisions to the regulations implementing CEQA. These changes affected the language applicable to staff’s analysis of cultural resources. Previously, the bulk of the information on how to assess resource and impact significance and on the types of mitigation measures available was contained in Appendix K of the CEQA

Guidelines. Much of the language of that appendix has now been incorporated into Title 14, California Code of Regulations, § 15126.4 and § 15064.5.

The CEQA Guidelines now explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historic resources.” The guidelines provide a definition for historic resources and set forth a listing of criteria for making this determination. As used in CEQA, the term “historic resources” includes any resource, regardless of age, as long as it meets one or more of the listed criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a “substantial adverse change in the significance of the historic resource,” which the regulation defines as a significant effect on the environment. The recent CEQA changes also indicate that the mitigation for impacts to historic resources that meet these criteria shall not be subject to the limitations provided in Public Resources Code § 21083.2.

Using the above criteria, staff has determined that two cultural resources described in the initial studies and subsequent filings for the MVPC project meet one or more of the criteria for being an important or significant historical resource. As such, staff recommends full mitigation during project construction and operation activities, in order to protect these resources.

CEQA also contains a section addressing “unique” archeological resources and provides a definition of such resources (Public Resources Code, § 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the prohibition in this section does not apply when an archeological resource has already met the definition of a historical resource (Title 14, California Code of Regulations, § 15064.5). Since staff has determined that the sites for which it is recommending mitigation meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

## **CUMULATIVE IMPACTS**

The potential for cumulative impacts may be associated with the degree of prehistoric and historic sensitivity. The MVPC site is in an area sensitive for cultural resources, especially historical resources. There are no known additional projects being constructed within the proposed project area. Therefore, cumulative impacts is not an issue at this time. Studies have been on-going in both the City of San Bernardino and City of Fontana, but none that will effect cumulative impacts.

Proposed developments such as the MVPC power plant and its associated linear facilities in conjunction with other development projects would not alter the amount of land currently exposed to public access and/or the potential removal or damage to cultural resources. The combined effects of development may at times accelerate the potential for impacts to cultural resources, but not in this case.

## **IMPACTS OF FACILITY CLOSURE**

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The anticipated lifetime of the Mountainview project is expected to be at least thirty years. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned, orderly closure that will occur when the plant becomes economically non-competitive.

### **PLANNED CLOSURE**

At the time of planned closure, all then-applicable LORS will be identified and the Energy Commission-required closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources.

### **TEMPORARY CLOSURE**

According to the AFC, a temporary closure where there is no release of hazardous materials would necessitate the implementation of 24-hour security. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

### **UNEXPECTED PERMANENT CLOSURE**

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

## **COMPLIANCE WITH APPLICABLE LORS**

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Prior to initiating excavations along Mill Avenue/Arrow Route Highway, may need to obtain an encroachment permit from the respective cities (San Bernardino, Rialto, and Fontana), as well as the County of San Bernardino. Construction of the wastewater line will require compliance with County and State requirements (e.g. County Flood Control or Sanitation). Crossing the Santa Ana River, Warm Creek, Etiwanda Creek, or any other blue-line stream will necessitate an Army Corps of Engineers Section 404 Permit, and compliance with § 106 of the National Historic Preservation Act.

## **MITIGATION**

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For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible.

Often, however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

## **APPLICANT'S PROPOSED MITIGATION**

As indicated in the AFC, the best mitigation measure is to avoid impact. In this case, avoidance of impacts can be accomplished by delineating the linear boundaries of the known resources (AT&SF alignment and the Gage Canal) in those areas where the resources cross the project linear alignments.

Archaeological consultant Joseph Nixon (MVPC 2000k: 38) states:

In some cases, this can be accomplished through coordination between the Project Archaeologist (Archaeological Monitor) and the Project Engineer. Together they can identify the segments of previously reported resources along the construction easement and indicate them on the ground to insure their safety during construction. This can be accomplished with fencing, flagging, barriers, etc.

Unavoidable resources include the two known resources within the alignments, one insignificant resource on the alignment, and ten pending resources where the exact locations (or existence) have not been verified (see earlier discussion). Nixon (MVPC 2000k:38) states:

Prior to initiation of construction, the Project Archaeologist and the Project Engineer would visit the locations of cultural resources in the field and familiarize themselves with both cultural resources and construction concerns. To protect cultural resources and to minimize potential impacts, the Project Archaeologist and the Project Engineer should conduct a worker education meeting with Crew Supervisors and inform them of the locations of cultural resources, the nature of their marking on the ground, and their importance. This time can also be used to explain the reasons to protect resources, including both the importance of their information and their legal protections. Various instructions can be given to the Crew Supervisors addressing parking and driving in marked areas, collecting of artifacts, and reporting of materials when artifacts are encountered. A one or two page summary of monitoring actions, contacts, and personnel also could be distributed...

To insure the protection of previously reported cultural resources, as well as unidentified buried deposits, it is recommended that archaeological monitoring be performed at ... specific sites ... and at the two specific locations noted ... Additional archaeological monitoring should be done at all locations where cultural material is located during construction. Crew Supervisors should be responsible for reporting incidences of identification of cultural materials to the Project Engineer.

The following program is recommended:

Preconstruction assessment and construction training

Construction monitoring by an individual(s) meeting the minimum standards of the Secretary of the interior

Immediate removal of isolated finds and site recording and evaluation of any potentially significant resources (via CEQA and §106 guidelines) and, if necessary, inform the local Native Americans of any prehistoric finds

Notify the Project Engineer when activities can be resumed (minimal delays)

Arrange for the curation of any recovered artifacts

Prepare a technical report in accordance with ARMR guidelines and OHP data requests (Office of Historic Preservation)

## **STAFF'S PROPOSED MITIGATION MEASURES**

Commission staff concurs with the mitigation measures proposed by the applicant in the AFC and associated filings. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the U.S. Secretary of the Interior's guidelines and incorporate the policies and guidelines of the County of San Bernardino and the cities of San Bernardino, Highland, Redlands, Rialto, Fontana, and Etiwanda. The mitigation measures set forth in the conditions have been applied to previous projects before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts while allowing the timely completion of many projects throughout California.

Monitoring should occur along the proposed utility route, wastewater alignment(s), and plant site. No human remains have been identified within the project area. However, should such resources be identified, the local Native American representatives must be contacted (following notification to the County Coroner) and all requirements of state and federal law, as appropriate.

## **CONCLUSIONS AND RECOMMENDATION**

### **CONCLUSIONS**

There are six recorded pending cultural resources within the area of direct impact. Two sites are considered important or significant, and the existence of a subsurface component to the remaining four has not been confirmed.

The presence of these previously identified cultural resources indicates that there is a strong possibility that project construction could encounter potentially significant cultural resources. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards, and no significant adverse direct, indirect, or cumulative impacts to cultural resources will occur.

## RECOMMENDATION

Staff recommends that the Energy Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

## PROPOSED CONDITIONS OF CERTIFICATION

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**CUL-1** Prior to the start of project-related ground disturbance (which is defined for this condition and all cultural conditions that follow as any vegetation clearance, project site preparation, grading, trenching, filling; excavation or augering), the project owner shall provide the California Energy Commission (Energy Commission) Compliance Project Manager (CPM) with the name and statement of qualifications of its DCRS responsible for implementation of all cultural resources Conditions of Certification.

The statement of qualifications for the DCRS shall include all information needed to demonstrate that the specialist meet the minimum qualifications set forth by the Secretary of the Interior Standards, as following:

- a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;

- at least three years of archaeological resource mitigation and field experience in California; and

- at least one year's experience in each of the following areas:

- leading archaeological resource field surveys;
- leading site and artifact mapping, recording, and recovery operations;
- marshalling and use of equipment necessary for cultural resource recovery and testing;
- preparing recovered materials for analysis and identification;
- determining the need for appropriate sampling and/or testing in the field and in the lab;
- directing the analyses of mapped and recovered artifacts;
- completing the identification and inventory of recovered cultural resource materials; and
- preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Officer (SHPO), and the appropriate regional archaeological information center(s).

The statement of qualifications for the DCRS shall include:

a list of specific projects the specialist has previously worked on;

the role and responsibilities of the specialist for each project listed; and

The names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

At least ninety (90) days prior to the start of project-related ground disturbance, the project owner shall submit the name and statement of qualifications of its DCRS to the CPM for review and written approval.

At least ten (10) days, but no more than thirty (30) days prior to the start of project-related ground disturbance, the project owner shall confirm in writing to the CPM that the approved DCRS will be available at the start date and is prepared to implement the cultural resource Conditions of Certification.

At least ten (10) days prior to the termination or release of a DCRS, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and a statement of qualifications of the proposed new DCRS.

**Cul-2** Prior to the start of project-related ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the DCRS requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the cultural resources specialist and the CPM within five days. Maps shall show the location of all areas where surface disturbance may be associated with project-related access roads, and any other project components.

At least seventy-five (75) days prior to the start of project-related ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings. Copies of maps or drawings reflecting changes to the footprint of the power plant and/or linear facilities shall be submitted to the cultural resources specialist and the CPM within five days of the changes.

**CUL- 3** Prior to the start of project-related ground disturbance; the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to sensitive cultural resources. Approval of the CRMMP, by the CPM, shall occur prior to any project-related ground disturbance.

The CRMMP shall include, but not be limited to, the following elements and measures.

A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials.

Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.

Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.

A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.

A discussion of any measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

A discussion of the location(s) where monitoring of project construction activities is deemed necessary by the DCRS. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present. Monitoring shall

A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.

A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction. Monitoring shall occur in the vicinity of the suspected locations of previously recorded cultural resources.

Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how they will be met. Also the name and phone number of the contact person at the institution shall be included.

At least sixty (60) days prior to the start of project project-related ground disturbance, the project owner shall provide the CRMMP, prepared by the DCRS, to the CPM for review and written approval.

**CUL-4** Prior to the start of project-related ground disturbance, the DCRS shall prepare an employee training program. The project owner shall submit the

cultural resources training program to the CPM for review and written approval.

The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the DCRS or qualified member of the cultural resources team(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern.

At least sixty (60) days prior to the start of project-related ground disturbance; the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of the individual(s) performing the training.

**CUL-5** Prior to the start of project-related ground disturbance, and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved a set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Within seven (7) days after the start of project-related ground disturbance, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of construction the CPM-approved cultural resource training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report, after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers, construction supervisors, and workers hired in the month to which the report applies, the CPM-approved cultural resources training and the set of resource reporting and work curtailment procedures.

**CUL-6** The DCRS or the monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are

encountered or may be affected in an unanticipated manner during project-related ground disturbance

If such resources are found, the halting or redirection of construction shall remain in effect until:

- the specialist has notified the CPM of the find and the work stoppage;
- the specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed;
- and

any needed data recovery and mitigation has been completed.

The specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the specialist and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Thirty (30) days prior to the start of project-related ground disturbance; the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find.

For any cultural resource encountered, the project owner shall notify the CPM as soon as possible.

**CUL-7** Prior to the start of project-related ground disturbance, and each week throughout project construction, the project owner shall provide the DCRS with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The DCRS shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Ten (10) days prior to the start of project-related ground disturbance, and in each Monthly Compliance Report thereafter, the project owner shall provide the CPM with a copy of each weekly schedule of the construction activities. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

**CUL-8** Throughout the pre-construction reconnaissance surveys and the construction monitoring and mitigation phases of the project, the DCRS and monitor(s) shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where

monitoring has been deemed unnecessary, and where cultural resources were found.

The designated specialist shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The designated resource specialist and monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Throughout the project construction period, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the DCRS and monitor(s) are available for periodic audit by the CPM.

**CUL-9** The DCRS or monitor(s) shall be present at times the specialist deems appropriate to monitor project-related ground disturbance, in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified. Cultural resources monitoring as deemed appropriate by the cultural resource specialist shall occur in the vicinity of the proposed gas line, the wastewater alignment and plant site. Cultural resources monitoring shall occur fulltime in the vicinity of the suspected locations of previously recorded cultural resources.

If the DCRS (DCRS) determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner and the CPM of the changes. The DCRS shall use milepost markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

Throughout the project construction period the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports prepared by the DCRS regarding project-related cultural resource monitoring.

**CUL-10** The project owner shall obtain ground disturbance or cultural resource excavation permits, as necessary. If cultural resources are unearthed in an area covered by the Corps of Engineers, the project owner shall consult with that agency and the CPM regarding compliance with § 106 of the National Historic Preservation Act.

The project owner shall submit a copy of any permit addressing data recovery excavation from federal agencies (e.g. Caltrans and/or the Corps of Engineers) or any permit required by a city, in the next monthly compliance report. After completion of the mitigation activity, the project owner shall also provide written documentation to the permitting agency and in the next Monthly Compliance Report following the completion of that activity, that the project owner has complied with any mitigation measures required as a result of permitted activity.

**CUL-11** The project owner shall ensure that the DCRS performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during

pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university (ies), or other appropriate research specialists. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

**CUL-12** Following completion of data recovery and site mitigation work, the project owner shall ensure that the designated cultural resources specialist prepares a proposed scope of work for the CRR. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

The proposed scope of work shall include (but not be limited to):

- a discussion of any analysis to be conducted on recovered cultural resource materials;
- discussion of possible results and findings;
- proposed research questions which may be answered or raised by analysis of the data recovered from the project; and
- an estimate of the time needed to complete the analysis of recovered cultural resource materials and to prepare the Cultural Resources Report (CRR).

The project owner shall ensure that the designated cultural resources specialist prepares the proposed scope of work within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

**CUL-13** The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report (CRR). The project owner shall submit the report to the CPM for review and written approval.

The CRR shall include (but not be limited to) the following:

a. For all projects:

- description of pre-project literature search, surveys, and any testing activities;
- maps showing areas surveyed or tested;
- a description of any monitoring activities;

maps, including maps using a 7.5 minute USGS topographic base, of any areas monitored; and

conclusions and recommendations.

For projects in which cultural resources were encountered, include the items specified under “a” and also provide:

site and isolate records and maps;

a description of testing for, and determinations of, significance and potential eligibility; and

a discussion of the research questions answered or raised by the data from the project.

For projects regarding which cultural resources were recovered, include the items specified under “a” and “b” and also provide:

a description of the methods employed in the field and laboratory; a description (including drawings and/or photos) of recovered cultural materials;

results and findings of any special analyses conducted on recovered cultural resource materials;

an inventory list of recovered cultural resource materials; an interpretation of the site(s) with regard to the research design; and

the name and location of the public repository receiving the recovered cultural resources for curation.

The project owner shall ensure that the DCRS completes the CRR within ninety (90) days following completion of the analysis of the recovered cultural materials. Within seven (7) days after completion of the report, the project owner shall submit the CRR to the CPM for review and written approval.

**CUL-14** The project owner shall submit an original, an original-quality copy, and a computer disc copy (or other format to meet the repository’s requirements), of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO), the appropriate regional archaeological information center(s), and a person employed by the City of San Jose who is authorized to receive confidential cultural resources information. If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

The copies of the Cultural Resource Report to be sent to the entities specified above shall include the following (based on the applicable scenario (a, b, or c) set forth in condition Cul-13):

originals or original-quality copies of all text;  
originals of any topographic maps showing site and resource locations;  
originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.  
photographs of any cultural resource site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curation repository with a set of negatives for all of the photographs.

Within thirty (30) days after receiving approval of the CRR, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO and the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved CRR with the public repository receiving the recovered data and materials for curation.

**CUL-15** Following the filing of the CPM-approved Cultural Resource Report with the appropriate entities, specified in condition CUL-14, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty (30) days after providing the CPM-approved Cultural Resource Report to the entities specified in CUL-14.

For the life of the project the project, owner shall maintain in its of compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

**CUL-16** If Native American artifacts are discovered as a result of project-related ground disturbance, the project owner and the designated cultural resources specialist shall consult with Serrano and Gabrielino Native American tribal representatives to develop an agreement(s) for qualified (specified in the NAHC Guidelines for Monitoring) monitor(s). The monitor(s) shall be considered a member(s) of the cultural resource team and shall be present during the pre-construction and construction phases of the project whenever cultural resources monitoring activities are conducted.

If Native American monitors are retained, the project owner shall provide the CPM with a copy of all finalized agreements for Native American (Serrano and/or Gabrielino) monitors. If efforts to obtain the services of qualified Native American

monitors prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

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# SOCIOECONOMICS

Jon Davidson

## INTRODUCTION

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A staff socioeconomic impact analysis evaluates the project-induced changes on community services and/or infrastructure including schools, medical and protective services and related community issues such as environmental justice. This analysis discusses the potential direct and cumulative impacts of the proposed Mountainview Power Plant (MVPP) project on local communities, community resources, and public services.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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### FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

### STATE

#### ***CALIFORNIA GOVERNMENT CODE, SECTIONS 65996-65997***

As amended by SB 50 (Stats. 1998, ch. 407, sec. 23), these sections state that public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

#### ***14 CALIFORNIA CODE OF REGULATIONS, SECTION 15131***

- a) Economic or social effects of a project shall not be treated as significant effects on the environment.
- b) Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- c) Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

## **LOCAL**

### ***SAN BERNARDINO COUNTY GENERAL PLAN***

The General Plan encourages increased economic development planning and promotion consistent with the economic well being of San Bernardino County. The General Plan notes that San Bernardino County has become a major corridor for transmission lines and pipelines, as well as the home for new power generation plants. Because such facilities can have a significant environmental impact, the General Plan states the costs and financial benefits associated with these facilities must be carefully weighed against potential effects.

Goal D-30 of the General Plan directs the County to “maximize the beneficial effects and minimize the adverse effects associated with the siting of major energy and telecommunication facilities” (San Bernardino County General Plan, 1989, as amended 1991). In this instance, one of the primary benefits to the local community due to construction and operation of the project would be economic in nature.

In regard to potential issues associated with environmental justice, General Plan Policy/Action ET-5(d) directs the County to “develop a system to provide affected communities with detailed information of proposed facilities as early as possible” (San Bernardino County General Plan 1989, as amended 1991).

### ***CITY OF REDLANDS GENERAL PLAN AND POLICIES***

The project site is located in an unincorporated area of San Bernardino County that is part of the Sphere of Influence of the City of Redlands. The City of Redlands is currently in the process of an annexation that includes the project site. Relevant City of Redlands General Plan and City Policies associated with the project are provided below.

The City of Redlands Development Fee Policy 1A.10 states that the cost of infrastructure required to mitigate the effects of new development shall be paid by that new development. All development projects are required to pay development fees to cover 100 percent of their pro rata share of the cost of any public infrastructure, facility or service. The City Council sets and determines fees based on appropriate cost-benefit analyses as required by the provisions of California law.

City policies on economic development encourage, among others, efforts to attract new employers into the City. The following policies of the City’s General Plan Economic Development Element are relevant to the proposed plant expansion:

Guiding Policy 11.0a: Promote a climate conducive to economic growth and rejuvenation to enhance employment and investment opportunities without sacrificing environmental standards.

Implementing Policy 11.0g: Assist in the expansion and retention of existing businesses and industries.

Implementing Policy 11.0k: Promote redevelopment and rehabilitation of older commercial and industrial areas to make them more efficient, accessible, aesthetically appealing, and economically viable.

## SETTING

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### PROJECT LOCATION

The proposed project is located in the northeast corner of the intersection of San Bernardino and Mountainview Avenues in San Bernardino County. For a full description of the location, please refer to the **Project Description** section of this document and the project description and location in the Mountainview Power Plant Application for Certification (AFC), Vol. 1 (Mountainview/ENSR, 2000). The study area (affected area), as defined in the socioeconomics section of the AFC, includes Los Angeles, Orange, Riverside, and San Bernardino Counties. The study area identified in the AFC was identified per the Electric Power Research Institute's report titled "Socioeconomic Impacts of Power Plants," which states that construction workers will commute as much as two hours to construction sites from their homes rather than relocate. Additionally, the report states operational workers will commute as much as one hour to a power plant site from their homes rather than relocate. Although northern San Diego County is within a one- to two-hour commute of the project site, and can provide a potential source of labor, it was excluded from evaluation as Los Angeles, Orange, Riverside and San Bernardino Counties have a sufficient labor pool for construction and operation of the project.

The project site is located within the "Inland Empire" region of southern California. This region, consisting of Riverside, San Bernardino, and eastern Los Angeles Counties, was historically used for agricultural purposes, but has experienced rapid population growth as a result of its proximity to the Los Angeles and Orange County metropolitan areas.

### DEMOGRAPHICS

Recent and projected population figures for the four-county study area are summarized in **Socioeconomics Table 1**.

Within the study area, the communities of Redlands, San Bernardino and Loma Linda are considered to be potentially affected by the proposed project. The racial and ethnic characteristics of these communities are summarized in **Socioeconomics Table 2**. The ethnic/racial profile is based on 1990 Census data. Within these communities, 60.6 percent to 79.6 percent of the population is white, while the remaining 20.4 percent to 39.4 percent of the population is comprised of minorities.

The demographic profile displayed in **Socioeconomics Table 3** provides the total white and minority populations within a six-mile radius of the proposed project site. The 1990 data for this table are from the 1990 Census, while the projected demographic profiles for the years 2000 and 2005 were generated by the marketing firm of Claritas, Inc. (Claritas, 2000). The projected demographic profiles for 2000

and 2005 indicate that the minority population in the area is increasing in size relative to the non-minority population. Because the Claritas data is an estimate based on the 1990 Census, staff considers the 1990 data to be the most reliable. **Socioeconomics Figure 1** displays the Census tracts in which 50 percent or more population was minority based on the 1990 Census.

Additional information regarding low-income and minority residential areas within the local project area is provided in the “Financial” and “Environmental Justice” sections of this analysis.

**SOCIOECONOMICS Table 1**  
**Recent and Projected Population Figures for the Study Area**

Area	Year				
	1980 <sup>1</sup>	1990 <sup>2</sup>	1999 <sup>3</sup>	2010 <sup>2</sup>	2020 <sup>2</sup>
Los Angeles County	7,477,421	8,901,987	9,757,500	10,604,452	11,575,693
Orange County	1,932,708	2,417,552	2,775,600	3,163,776	3,431,869
Riverside County	663,199	1,194,623	1,473,300	2,125,537	2,773,431
San Bernardino County	895,016	1,436,696	1,654,000	2,187,807	2,747,213

Sources:

<sup>1</sup> Historical Population Figures from California Department of Finance, Demographic Research Unit, Report 84 E-A, *Population Estimates for California Counties and Cities: 1970 – 1980*.

<sup>2</sup> Historical and Projected Population Figures from California Department of Finance, Demographic Research Unit, *County Population Projection with Race/Ethnic Detail, Estimated July 1, 1990-1996 and projections from 1997 through 2040*.

<sup>3</sup> 1999 Estimates as of January 1, 1999. California Department of Finance, Demographic Research Unit, *City/County Population Estimates, with Annual Percent Change, January 1, 1998 and 1999*.

**SOCIOECONOMICS Table 2**  
**Demographic Profile For The Communities of Redlands, San Bernardino and Loma Linda**

Race/Ethnicity	Redlands	San Bernardino	Loma Linda
White	79.6 %	60.6 %	64.1 %
Black	3.8 %	16.0 %	6.4 %
American Indian	0.7 %	1.0 %	0.5 %
Asian	4.4 %	4.0 %	21.4 %
Hispanic	11.5 %	18.4 %	7.4 %

Source: 1990 US Census Data, Regional Economic Information System, 1999.

**SOCIOECONOMICS – Figure 1**  
**Census Tracts with High Minority Populations (1990)**



**SOCIOECONOMICS Table 3**  
**Racial/Origin Profile of the Population Within Six Miles of the Project Site**

Race/Origin	Population					
	1990 Census		Year 2000 (Projected)		Year 2005 (Projected)	
	Number of Persons	%	Number of Persons	%	Number of Persons	%
White	160869	51.1	150395	42.7	145066	38.9
Black	33952	10.8	35694	10.1	36490	9.8
Hispanic	101233	32.2	140302	39.8	161273	43.2
American Indian/ Eskimo/ Aleutian	2041	0.6	1813	0.5	1749	0.5
Asian/Pacific Islander	15701	5.0	23094	6.6	27337	7.3
Other	756	0.2	1070	0.3	1141	0.3
Total	314552	100	352368	100	373056	100
Source: Claritas Inc., 2000						

## **EMPLOYMENT**

Within the study area, the majority of employment earnings are generated in the service, retail, manufacturing and government industries (Regional Economic Information System, 1999). Services and manufacturing are important industries, accounting for over 50 percent of all employment earnings. Construction employment represents approximately 4.5 percent of total employment earnings within the study area, and is concentrated primarily around residential and commercial development.

The 1999 unemployment rate for the Inland Empire was 4.8 percent (California Employment Development Department, 1999). Historically, the unemployment rate for the Inland Empire has ranged between six and 11 percent, with a steady decrease in the unemployment rate between 1993 and 1998 (California Employment Development Department, 1999). In the first five months of 1998, the majority of additional employment opportunities with the Inland Empire were in the construction, manufacturing, professional and business service sectors. Construction, in response to the demands for residential, office and heavy construction projects, is expected to add 7,700 new jobs to payrolls by the year 2002 (California Employment Development Department, 1999). As of June 1999, the Inland Empire had a construction workforce of 64,000. The total construction workforce in Los Angeles County consists of approximately 126,000 workers while approximately 68,000 construction workers are located in Orange County.

## **FINANCIAL**

**Socioeconomics Table 4** provides total earnings, by County, for the study area as a whole for 1996 and 1997.

**SOCIOECONOMICS Table 4**  
**Non-Farm Earnings for the Study Area 1996 – 1997\***

Industry	San Bernardino	Riverside	Los Angeles	Orange	Four-County Total	Percent of Four-County Total
Services	4,359,801	3,846,167	69,720,311	17,656,717	95,582,996	34.9
Wholesale Trade	1,038,327	564,054	12,741,333	5,418,342	19,762,056	7.2
Retail Trade	2,139,676	1,739,828	15,134,083	5,346,569	24,360,156	8.9
Manufacturing	2,283,124	1,721,409	28,928,996	10,636,397	43,569,926	15.9
Government	3,335,280	2,751,353	21,793,746	5,265,875	33,476,254	12.2
Transportation & Public Utilities	1,411,494	608,509	13,100,568	3,060,636	18,181,207	6.6
Construction	1,212,587	1,357,784	6,446,561	3,308,447	12,325,379	4.5
Finance, Insurance & Real Estate	936,703	754,351	16,159,000	6,435,627	24,285,681	9.0
Agriculture	118,652	295,091	621,876	419,715	1,455,334	0.5
Mining	46,834	28,483	465,141	83,826	624,284	0.3
Total Non-Farm Earnings	17,212,478	13,667,029	185,111,615	57,632,151	273,623,273	100

Source: Regional Economic Information System, 1999

\* In thousands of dollars.

San Bernardino County reported taxable transactions of approximately \$3.35 billion during the first quarter of 1998. For the fiscal year 1997-1998, budgeted expenditures for the County totaled \$1.26 billion. The projected budget for the 1999-2000 fiscal year is approximately \$1.36 (San Bernardino County Treasurer's Office).

The City of Redlands generated approximately \$62.9 million in revenues for the 1998-1999 fiscal year and is expected to generate \$63.2 million during the 1999-2000 fiscal year (Reynolds, 1999). The projected budget for the 1999-2000 fiscal year is approximately \$73.8 million.

The estimated median family income for the Inland Empire as a whole is \$43,300, which is slightly higher than the national average, but lower than the median family incomes of Los Angeles (\$46,900) and Orange (\$61,300) Counties (San Bernardino County Department of Economic and Community Development, 1997).

Within the local project area, a household is considered low income if its income is less than 80 percent of the median for that area (San Bernardino Economic Development Agency, 2000). Based on the 1990 Census, the median household income for the County of San Bernardino in 1989 was \$33,443 annually. Consequently, a household may be considered low income if its annual income in 1989 was less than \$26,754. The Census indicates that the annual median income for households located within a six-mile radius of the project site was \$28,383 in 1989.

According to the marketing firm Claritas, the current estimated median household income for San Bernardino County is \$37,773; therefore, a household would be considered low income if its annual income is less than \$30,218. The estimated household income for the area within a six-mile radius of the project site is \$31,838 annually. Although this information does not definitely indicate that households in the local project area are low income, it does suggest that pockets of low-income areas may exist.

A review of 1990 Census tract data also indicates the existence of low-income pockets in the study area. According to 1990 Census data, approximately 15 percent of the population within a six-mile radius of the proposed power plant site is below the poverty level. However, the Census data also indicates that the study area contains 12 Census tracts in which 30 percent or more of the population is below the poverty level. These 12 Census tracts are generally located to the northwest of the proposed project site, in the central San Bernardino area. The percentage of the population below the poverty level in these tracts is considered meaningfully greater than that of the overall study area.

To help further identify low-income pockets in the vicinity of the proposed project site, staff conducted a survey on August 2, 2000, focusing on residential neighborhoods within a 1-1½-mile radius of the project site. Staff's survey confirmed the existence of low-income and working class residential areas to the southwest and west of the project site. No residential neighborhoods were found to the north, east, or southeast of the project site within a 1-1½-mile radius.

The applicant also conducted a field survey of the local project area to help identify low-income and minority neighborhoods within a six-mile radius of the proposed power plant site. Cities included in the survey included: Colton; Grand Terrace; Highland; Loma Linda; Redlands; and San Bernardino. Additionally, unincorporated portions of San Bernardino and Riverside Counties were included.

The applicant's survey methodology began with review of 1990 Census data to identify areas that may qualify as low income. Additionally, discussions with local real estate agents were completed to help focus survey efforts. Subsequent to this research, the six-mile radius surrounding the proposed power plant site was established and a grid pattern was developed. Using the grid, selected areas (per findings of the above-referenced research) were traversed to identify neighborhoods with high minority populations and buildings/structures of notable disrepair.

Of those areas surveyed, low-income housing was identified in Colton, Highland, Redlands, and San Bernardino County. Minority neighborhoods were identified in Colton, Highland, Grand Terrace, Loma Linda, Redlands and San Bernardino County. During the field survey, no other residential areas equal to or greater than two blocks in size were determined to be of distinct minority status.

## **HOUSING**

As of January 1999, there were approximately 569,000 housing units in San Bernardino County, 604,000 units in Riverside County, 3.3 million units in Los

Angeles County, and 955,000 units in Orange County (California Department of Finance, 1999). These totals include single- and multi-family residences, as well as mobile homes. Vacancy rates within the four-County area range from 5.5 to 16.0 percent (California Department of Finance, 1999). Per the federal housing standard, an area with a vacancy rate above 5 percent is not considered to be in short supply.

In addition to the above, there are a number of motel/hotel accommodations and recreational vehicle sites available in the local project vicinity. The City of San Bernardino has approximately 1,000 hotel/motel rooms and one extended stay lodge. Occupancy rates in San Bernardino range from 65 to 70 percent throughout the year, with some drops occurring in July/August and November/December (Patterson, 1999). The City of Redlands has an estimated 580 motel/hotel rooms, with a general occupancy rate of 70 percent.

## **SCHOOLS**

Data for schools within the entire four-county study area were not compiled for this analysis because a sufficient labor pool exists within the study area and it is anticipated that construction and operations workers will commute to the project site rather than relocate.

The power plant site itself falls within the Redlands Unified School District, which currently includes 14 Elementary Schools, three Middle Schools, two High Schools, and two Alternative Schools (Public Education in San Bernardino County, 2000). The nearest school to the power plant site is Victoria Elementary School, located at 1505 Richardson Street.

## **UTILITIES, EMERGENCY AND OTHER SERVICES**

Electricity in the local project area is distributed by SCE; natural gas is supplied by the Southern California Gas Company. Natural gas for the project itself will be supplied by the proposed 17-mile pipeline described in the **Project Description** section of this document.

Makeup water sources for the project include well water from on- and offsite wells from the Gage Water Company. Depending on quality and treatment costs, the project may be able to use 50 percent of its makeup water from the City of Redlands. The proposed project would require an estimated 7 million gallons of makeup water per day. Potable water for the project would be supplied by purchased bottled water. Project wastewater, when it occurs, would be discharged to the eastern terminus of the Santa Ana Regional Inceptor (SARI) pipeline, which is located at the San Bernardino Municipal Wastewater Treatment Plant.

Non-hazardous solid waste associated with the project would be recycled and deposited in either a Class III landfill, or handled in some other type of environmentally safe manner. There are currently three Class III landfills within San Bernardino County.

The project site is served by the City of Redlands Fire Department, which includes 59 firefighters and paramedics operating out of three fire stations (Redlands Chamber of Commerce, 1999). The closest station to the project site (Station 263) typically has 17 firefighting and paramedic staff on duty at all times; response time to the project site is estimated to be approximately 12 minutes (Rivera, 1999).

The San Bernardino County Sheriff's Department's Central Station is responsible for law enforcement within project site area. The Central Station has 50 full-time officers, including a Search and Rescue Team and a Multiple Enforcement Team (San Bernardino County Sheriff's Department website, 1999). Emergency response time to the project site from the Central Station is estimated to be approximately six minutes (Botrell, 1999).

If the project site is annexed by the City of Redlands, the Redlands Police Department will provide law enforcement services to the project site. The Redlands Police Department has 78 sworn officers, 25 patrol cars, 15 unmarked cars, four community substations, and other related vehicles and equipment.

The applicant currently has a contract with the Loma Linda Community Hospital for emergency services. Other hospital/medical facilities within a ten-mile radius of the project site include: Redlands Community Hospital, located approximately four miles southeast of the project site; Loma Linda University Medical Center, located three mile southwest of the of the project site; Arrowhead Regional Medical Center, located approximately seven miles west-northwest of the project site; and, San Bernardino Community Hospital, located approximately ten miles northwest of the project site.

## **IMPACTS**

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### **PROJECT-SPECIFIC IMPACTS**

Staff reviewed the Mountainview Power Plant AFC, Volume 1, dated January 2000, Socioeconomic Section 6.7, as well as responses to project-specific data requests regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and environmental justice. Additionally, staff requested and reviewed two research analyses from the marketing firm Claritas, Inc. These analyses were specific to (1) the historic and projected demographic profiles of the area within a six-mile radius of the power plant site, and (2) historic and projected property values within a six-mile radius of the power plant site. The applicant used appropriate public databases in the analysis in the AFC. Staff's analysis is based on verification of the information within the AFC and independent research.

### ***EMPLOYMENT***

The applicant expects that most construction workers would commute daily two hours or less each way to the project site. Most construction workers would not be expected to relocate during construction. Construction of the facility would take approximately 19 months and the personnel required for construction would peak

during month 12 (568 workers on site). Approximately 33 personnel would be employed during operations. Tables 6.7-7 through 6.7-9 in the socioeconomic section of the AFC display information on employment distribution within the study area, the types of personnel needed for project construction by month, available labor by skill within the four-county study area, and the estimated plant operations work force. These numbers are consistent with other power plant projects.

Based upon the data presented in Tables 6.7-7 through 6.7-9 of the AFC, staff concludes that construction and operation of the project would not have a significant impact on employment either regionally or locally. In general, full-time jobs have a multiplier effect on the local and regional economy by supporting additionally indirect job growth. It is estimated that two to three indirect jobs would be supported by each construction job, such as those that would be generated by the proposed project. A net benefit is therefore likely to occur.

## HOUSING

The demand for housing within the study area is not expected to increase appreciably as a result of the proposed project because the vast majority of the work force is expected to commute from within a two-hour distance of the project site. A small percentage of construction workers may choose to commute on a weekly basis; however, there are adequate hotel/motel and recreational vehicle parks and campgrounds within the local project vicinity to accommodate these workers. Staff concludes that construction of the proposed project would not significantly increase the demand for housing.

Of the estimated 33 employees needed for operation of the project, it is estimated that 90 to 95 percent of the plant's workers would commute from within the study area. The remaining 5 to 10 percent of the employees (1 to 4 workers) may be hired from outside of the study area and would likely relocate to within a one-hour commuting distance of the project site. This increase would not create a significant impact on available housing within the study area.

## SCHOOLS

As referenced above, the majority of the project's construction personnel would commute. As such, the project is not anticipated to impact the school districts of Los Angeles, Orange, San Bernardino and Riverside Counties.

An estimated one to four new families may enter the local project area due to operational requirements. The Redlands Unified School District enrollment is currently at capacity, and the estimated influx of up to four families may potentially impact the District. The District would charge the applicant fees for the square footage of covered and enclosed office space associated with the expansion, which, per state law, mitigates potential impacts to the District (Shira, 2000). Staff has proposed Condition of Certification **SOCIO-2** to reflect this requirement.

## UTILITIES, EMERGENCY AND OTHER SERVICES

Construction and operation of the project is not expected to create a demand for utilities that cannot be met by local utility providers. There is adequate makeup

water, natural gas and electrical supplies, as well as available landfill space to meet the project's construction and operational demands. Construction-phase water requirements can be met from on-site wells and potable water would be contracted from bottled water services.

Plant wastewater would be discharged to the eastern terminus of the SARI pipeline located at the San Bernardino Municipal Wastewater Treatment Plant. The applicant has purchased needed capacity in the SARI pipeline; therefore, no significant impact is expected to occur.

While there is a potential for increased calls to the City of San Bernardino Fire Department as a result of project construction and operation, there are adequate medical and emergency response services within a 10-mile radius of the project site. Development exactions for mitigating any increases in public services due to construction and operation have been negotiated between the applicant and the City of Redlands. Therefore, construction and operation of the proposed project is not expected to create a significant impact on emergency services.

## **FINANCIAL**

The applicant estimates that the total capital cost of the proposed project is \$550 million. The operational payroll for the project is estimated to be approximately \$1.97 million per year for the first year of operation. The total construction payroll for the power plant is estimated to be \$30 million. This estimate excludes payroll taxes and burdens. The estimated cost for materials and supplies is estimated to be approximately \$5 million.

The proposed project is anticipated to provide an estimated \$3.5 to \$4 million in local property tax revenues, a portion of which would be distributed to the Inland Valley Development Agency as tax increment revenues with set asides for housing and pass-throughs to various school districts.

Project construction and operation would create a beneficial impact on both the study area's economic base and fiscal resources through employment of both local and regional workers, as well as through the purchases of local and regional construction materials.

## **ENVIRONMENTAL JUSTICE**

For all siting cases, staff follows the U.S. Environmental Protection Agency's guidance in conducting a two-step environmental justice analysis. The analysis assesses:

- Whether the population in the area potentially affected by the proposed project is more than 50 percent minority and/or low-income, or has a minority or low-income population percentage that is meaningfully greater than the percent of minority or low income in the general population, or other appropriate unit of geographic analysis; and
- Whether significant environmental impacts are likely to fall disproportionately on the minority and/or low-income population.

If the analysis indicates the presence of a substantial minority or low-income population, local community groups are contacted to provide the Commission with a fuller understanding of the community and the potential environmental justice issues.

Staff has determined the affected area for this environmental justice analysis, the area potentially impacted by the proposed project (primarily for air quality and public health), to be the area within a six-mile radius of the proposed project site. In addition, communities adjacent to the proposed natural gas pipeline were considered qualitatively based upon the results of the July 5 and August 2, 2000, field surveys and data provided in **Socioeconomics Table 2**.

**Socioeconomics Table 2** provides the demographic profile for the communities of Redlands, San Bernardino and Loma Linda; this profile is based on the 1990 Census. On the basis of this data, the proposed natural gas pipeline would affect communities having a minority or low-income profile of more than 50 percent.

To assess the demographic profile within a six-mile radius of the proposed power plant site, the 1990 Census tract data for the area was reviewed. Additionally, projected demographic profiles for the years 2000 and 2005 were generated by the marketing firm of Claritas, Inc. (Claritas, 2000). It is noted that because the Claritas data is an estimate based on the 1990 Census, staff considers the 1990 data the most reliable. **Socioeconomics Table 3** provides the demographic profile for the area within a six-mile radius of the proposed power plant site. According to the data presented in **Socioeconomics Table 3**, as of 1990, 48.9 percent of the population within the six-mile radius was minority. According to the projected demographic profiles calculated by Claritas, this area will be populated by a 57.3 percent minority in the year 2000, and a 61.1 percent minority in the year 2005.

Because the population percent of minority within the six-mile radius was 48.9 percent in 1990, and is estimated to be 57.3 percent in 2000, staff considers the minority percent of population within the six-mile radius to be over 50 percent.

To further evaluate the local demographic and low-income characteristics of the six-mile area surrounding the project site, staff requested additional data and field surveys to identify any pockets of residents that are distinctively low-income or of minority status. Results of the survey identified low-income housing in Colton, Highland, Redlands, and San Bernardino County.

Because the federal guidance does not give a percentage of population threshold to determine when a low-income population becomes recognized for an environmental justice analysis, staff uses the same greater than 50 percent threshold that is used for minority populations, as well as a "meaningfully greater" percentage population. According to 1990 U.S. Census data, approximately 15 percent of the population within the six-mile radius of the proposed project is below the poverty level. There are no census tracts in this area with more than 50 percent of the population below the poverty level; however, there are 12 census tracts in this area with more than 30 percent of the population below the poverty level. By comparison, the 1990 Census

indicates that the percentage of the population below the poverty level is 22 percent for the City of San Bernardino, 9 percent for the City of Redlands, and 11 percent for the City of Loma Linda. Staff considers the percentage of population below the poverty level in these 12 Census tracts to be meaningfully greater than that of the overall study area and surrounding communities. Surveys of the study area also confirmed the existence of low-income and working class neighborhoods.

Early in the application process, the applicant notified residents and businesses in the immediate area west of the project site of their proposal to construct and operate a new power plant (no residences or businesses are located immediately east, north or south of the site). Staff outreach efforts included hand delivery of a flyer in both English and Spanish regarding a public hearing and workshop held in San Bernardino on June 13, 2000. On July 26, 2000, a public staff workshop, focused on environmental justice, was held at Victoria Elementary School. Staff has tried to identify any unique circumstances that may exist in the area (e.g., local public health issues) that would indicate a need for further investigation of environmental justice issues, but no such circumstances have been identified to date. The applicant has stated that to date there have been no significant public health, hazardous materials, or air quality concerns expressed regarding the proposed plant expansion by the media, public officials or the local communities or neighboring residents or businesses. Only one inquiry has been received to date; it was made by a local resident who was concerned about the plant's ability to create cellular phone interferences.

Even though low-income and minority populations exist in the area around the proposed project, staff has not identified any significant, project-related, unmitigated adverse environmental effects; therefore, no significant adverse impacts to minority or low-income populations are expected to occur. The **Air Quality, Public Health and Hazardous Materials Handling** sections of the AFC indicate that potential risks to the public can be mitigated to a less-than-significant level through use of minimized hazardous materials, engineering controls, operational controls, administrative controls, and emergency response planning. Additionally, staff has not identified any significant adverse cumulative impacts associated with the proposed power plant project and, therefore, no significant adverse cumulative impacts to minority or low-income populations are expected.

Staff concludes that there is a minority population greater than 50 percent and a meaningfully greater percentage low-income population within six miles of the project site. However, considering that (1) community input to date has not indicated the need for any action to lessen the potential issues associated with environmental justice, (2) staff has not identified any unique circumstances regarding the minority or low-income population, (3) potential public health risks can be mitigated to less-than-significant levels, and (4) no significant cumulative adverse impacts have been identified, there is no environmental justice issue regarding the proposed Mountainview Power Plant Project.

## **PROPERTY VALUES**

In general, the four-county study area is experiencing significant growth; additionally, the Inland Empire is anticipated to be the fastest growing metropolitan area in the United States during the next decade. It is expected to add over 800,000 people and reach a population in excess of 3.6 million by the year 2005 (Inland Empire Economic Partnership, 1999).

An analysis of owner-occupied housing values within a six-mile radius of the project site was generated by the marketing firm of Claritas, Inc. (Claritas, 2000). The base data for this analysis was the 1990 Census. Per the Census, in 1990 there were 114,912 housing units within the six-mile project radius; the median housing value in 1990 for the six-mile radius was \$103,698. The Claritas projection for the year 2000 estimates that there will be 128,466 housing units within a six-mile radius by the year 2000, with a median housing value of \$108,179. The Claritas projection for the year 2005 estimates 136,856 housing units, with a median housing value of \$107,748.

To date, no known concerns have been expressed regarding the potential for local residents and businesses to be unable to get full market value for their properties once the proposed plant expansion is built and operating. Historically, however, property value concerns have been expressed on projects similar to the proposed plant expansion. To address these concerns, staff has, on previous project analyses, assessed the potential property value impacts associated with natural gas-fired power plants. In general, staff has determined that there is no information or study that demonstrates an adverse or negative impact on property values directly attributable to a natural gas-fired power plant. Based upon this finding, and in conjunction with the Claritas projections for continued housing development and increases in property values, staff concludes that it is unlikely that the proposed project will adversely impact property values within the immediate power plant vicinity.

## **CUMULATIVE IMPACT**

Cumulative impacts were assessed by researching other large-scale construction projects in the study area, where overlapping construction schedules could create a demand for workers that could not be met by labor in the four-county area. Based on discussion with local planning agencies, no large-scale construction projects were identified within the study area that could create potentially significant impacts to the socioeconomics of the region. Similarly, there were no cumulative impacts identified from operation of the proposed project, as most permanent project personnel will be hired from the four-county area and would not likely relocate. Consequently, no significant cumulative impacts on the socioeconomics of the study area are anticipated to occur due to operation.

## **FACILITY CLOSURE**

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### **UNEXPECTED PERMANENT CLOSURE**

Should the proposed plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur. The AFC describes what will happen if the plant is shutdown or closed prematurely. The planned service life of the proposed power plant is 30 years; however, given unforeseen circumstances the plant may be retired prematurely for a variety of reasons. This could include the determination that the plant is no longer economically viable.

### **UNEXPECTED TEMPORARY CLOSURE**

Should the plant be temporarily shutdown or closed, there would not be any significant socioeconomic impacts. The applicant would conduct a review to determine if there had been any environmental damage or release of hazardous materials. If not, the plant could be mothballed. Before the plant begins commercial operation, the applicant will develop a contingency plan to deal with premature or unexpected closures. This would include communication with the Energy Commission, and either the County of San Bernardino or the City of Redlands (if the annexation action is completed), as well as other local agencies regarding schedule of facility closure and compliance with LORS.

### **PLANNED CLOSURE**

In the event that the decision is made to permanently close the facility, the applicant will develop a plan for decommissioning that will be submitted to the Energy Commission and other appropriate agencies. The plan will include compliance with all applicable LORS. Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur.

## **MITIGATION**

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Energy Commission staff has identified economic and fiscal benefits to the overall study area and local project site vicinity such as employment, project expenditures, sales, and property tax revenues. To ensure that the local area benefits from the project, staff is proposing a condition of certification that will lead to local employment and project-related expenditures. Staff has also proposed a condition of certification reflecting the applicant's obligation to pay fees pursuant to Sections 65996-65997 of the California Government Code to offset the cost of school facilities.

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

Staff believes that the Mountainview Power Plant Project would not cause a significant adverse direct or cumulative impact on housing, employment, schools (as mitigated through fees), public services or utilities.

The Mountainview Power Plant Project would have a benefit to the four-county study area and the local project vicinity in terms of an increase in local jobs and commercial activity during construction and operation of the facility. The construction payroll and project expenditures would also have a positive effect on the local and regional economy. The estimated benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods, and equipment. The estimated annual operating payroll for the first year of the project is \$1.97 million. Overall, staff believes that the project will have a positive socioeconomic impact on the local and regional area.

Although minority and low-income populations exist in the vicinity of the proposed power plant site, staff has not identified any significant unmitigated adverse environmental effects associated with the proposed project alone, or cumulative effects from the proposed project and other industrial projects in the vicinity. Therefore, staff has determined that there is no potential for significant impacts to minority and/or low-income populations in the area affected by the proposed project.

The project, as proposed, would be consistent with all applicable socioeconomic LORS. The proposed conditions of certification ensure the compliance with LORS, that anticipated local benefits occur to the extent feasible, and that the one-time assessment fee is paid to the Redlands Unified School District.

### RECOMMENDATIONS

If the Energy Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

### PROPOSED CONDITIONS OF CERTIFICATION

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**SOCIO-1:** The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies from within San Bernardino, Riverside, Los Angeles, and Orange Counties, and encourage such recruitment and purchases within the local vicinity of the proposed project area first unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available; or
- qualified employees for specific jobs or positions are not available; or

- there is a reasonable basis to hire someone for a specific position for outside the local area.

**Verification:** At least sixty (60) days prior to the start of earth moving activities, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.

**SOCIO-2** The project owner shall pay the one-time statutory school facility development fee as required at the time of filing for the in-lieu building permit with the County of San Bernardino Building Department.

**Verification:** The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following payment.

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# BIOLOGICAL RESOURCES

Dr. Jeff Kaufmann, Natasha Nelson, Rick York and Ileene Anderson

## INTRODUCTION

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This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the Mountainview Power Plant (MVPP) by the Mountainview Power Company (MVPC). This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of ancillary facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the Applicant, and where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the MVPP Application for Certification (AFC) (MVPC 2000a, AFC Section 6.13), addenda to the AFC (MVPC 2000a, Appendix J), response to staff data requests (MVPC 2000k, 2000kk, and 2000ll), workshops, site visits, and discussions with various agency representatives.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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The Applicant, MVPC, will need to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

### FEDERAL

#### ***CLEAN WATER ACT OF 1977***

Title 33, United States Code, §1251 through §1376, and Code of Federal Regulations, part 30, §330.5(a)(26). The Act requires the permitting and monitoring of all discharges to surface water bodies. Section 404 permits from the U.S. Army Corps of Engineers and Section 401 permits from the state Water Resources Control Board are issued under the authority of this Act.

#### ***ENDANGERED SPECIES ACT OF 1973***

Title 16, United States Code, §1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

#### ***MIGRATORY BIRD TREATY ACT***

Title 16, United States Code, §703 through §712, prohibits the take of migratory birds.

## **STATE**

### ***CALIFORNIA ENDANGERED SPECIES ACT OF 1984***

Fish and Game Code §2050 et seq. protects California's rare, threatened, and endangered species.

### ***NEST OR EGGS – TAKE, POSSESS, OR DESTROY***

Fish and Game Code §3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

### ***BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY***

Fish and Game Code §3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

### ***MIGRATORY BIRDS – TAKE OR POSSESSION***

Fish and Game Code §3513 protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

### ***FULLY PROTECTED SPECIES***

Fish and Game Code §3511, §4700, §5050, and §5515 prohibits take of animals that are classified as Fully Protected in California.

### ***SIGNIFICANT NATURAL AREAS***

Fish and Game Code §1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

### ***STREAMBED ALTERATION AGREEMENT***

Fish and Game Code §1600 et seq. requires California Department of Fish and Game (CDFG) to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

### ***NATIVE PLANT PROTECTION ACT OF 1977***

Fish and Game Code §1900 et seq. designates state rare, threatened, and endangered plants.

### ***CALIFORNIA CODE OF REGULATIONS***

Title 14 (§670.2 and §670.5) list animals of California designated as threatened or endangered.

### ***REGIONAL WATER QUALITY CONTROL BOARD***

To verify that the federal Clean Water Act permitted actions comply with state regulations, MVPP will need to get a Section 401 certification from Santa Ana Regional Water Quality Control Board. The Regional Board provides its certification

after reviewing the federal Nationwide Permit(s) that is provided by the U. S. Army Corps of Engineers.

## **LOCAL**

### ***SAN BERNARDINO COUNTY GENERAL PLAN***

Sections 6.13.1.3 and 6.13.4 encourage preservation and management of biotic resources, especially sensitive species and habitats. The general plan puts planning constraints in sensitive habitat areas, and requires mitigation if there will be significant project effects on threatened or endangered species.

### ***SAN BERNARDINO COUNTY MULTI-SPECIES HABITAT CONSERVATION PLAN***

Governor Wilson's Natural Community Conservation Program in southern California proposed the development of the San Bernardino Multi-species Habitat Conservation Plan (MSHCP) as a subregional plan. The MSHCP planning began in 1996, but was halted in 1998 by top county officials, and has never been finalized. The Applicant has been in contact with CDFG regarding the MSHCP. CDFG indicated that because of the low habitat values of the power plant and pipeline corridors, construction would be consistent with the MSHCP goal of avoiding habitat disturbance and encouraging species preservation (MVPC 2000k).

### ***CITY OF REDLANDS, ZONING***

Land use at the proposed power plant site will be zoned M-2, which is an industrial category. MVPC has a Development Agreement with the City of Redlands to make the proposed project a permitted use in the M-2 zone. Construction in this highly disturbed area will not require a conformance analysis for biological resources.

### ***CITY OF REDLANDS, GENERAL PLAN***

#### **GUIDING POLICY 7.21A**

Sets forth implementing policies designed to achieve the continued viability of wildlife and value habitat throughout the City of Redlands Planning Area.

#### **GUIDING POLICY 7.21D**

Sets forth implementing policies designed to preserve, protect, and enhance wildlife corridors, including the Santa Ana River Wash.

#### **GUIDING POLICY 7.21H**

Requires a biological assessment of any proposed project site where species or the habitat of species defined as sensitive or special status by the Department of Fish and Game or the U.S. Fish and Wildlife Service might be present.

#### **GUIDING POLICY 7.21I**

Requires that proposed project adjacent to, surrounding, or containing wetlands, riparian corridors, or wildlife corridors be subject to a site-specific analysis that will determine the appropriate size and configuration of a buffer zone to be determined

in consultation with the Department of Fish and Game, U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers as appropriate.

#### **GUIDING POLICY 7.21T**

Requires the evaluation of agricultural fields for their habitat prior to conversion to other uses.

#### **REGIONAL DESCRIPTION**

The proposed project site is located within the San Bernardino Valley area of southern California. The valley floor consists of a series of brush-covered areas and urban development separated by stretches of dry washes created by the Santa Ana River, East Etiwanda Wash and Mill Creek (east of the project site). Remnants of native vegetation are interspersed with introduced annual grasses, shrubs, or trees, and agricultural fields. The riparian communities of the Santa Ana River and East Etiwanda Wash are characterized by alluvial fan sage scrub with pockets of willow woodlands and southern riparian scrub, all of which have varying degrees of degradation from surrounding land use.

A variety of sensitive species are found in the project region; these include, but are not limited to, Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*), least Bell's vireo (*Vireo bellii pusillus*), and San Bernardino kangaroo rat (*Dipodomys merriami parvus*).

For a complete list of the sensitive species the Applicant considered for this proposed project, see Biological Resources Table 1, below.

**BIOLOGICAL RESOURCES - Table 1**  
**Sensitive Species**  
(MVPC 2000a and MVPC 2000k)

<b><u>Sensitive Plants</u></b>	<b><u>Status*</u></b>
Marsh sandwort ( <i>Arenaria paludicola</i> )	FE/CE/CNPS 1B
Nevin's barberry ( <i>Berberis nevinii</i> )	FE/CE/CNPS 1B
Thread-leaved brodiaea ( <i>Brodiaea filifolia</i> )	FE/CE/CNPS 1B
Salt marsh bird's-beak ( <i>Cordylanthus maritimus</i> ssp. <i>maritimus</i> )	FE/CE/CNPS List 1B
Slender-horned spineflower ( <i>Dodecahema leptoceras</i> )	FE/CE/CNPS 1B
Santa Ana River woolly star ( <i>Eriastrum densifolium</i> ssp. <i>sanctorum</i> )	FE/CE/CNPS List 1B
Gambel's watercress ( <i>Rorippa gambellii</i> )	FE/CT/CNPS List 1B
Parish's bush mallow ( <i>Malacothamnus parishii</i> )	FSC/CNPS 1A
Pringle's monardella ( <i>Monardella pringlei</i> )	FSC/CNPS 1A
Plummer's mariposa lily ( <i>Calochortus plummerae</i> )	FSC/CNPS 1B
Smooth tarplant ( <i>Hemizonia pungens</i> ssp. <i>laevis</i> )	FSC/CNPS 1B
Parish's gooseberry ( <i>Ribes divaricatum</i> var. <i>parishii</i> )	FSC/CNPS 1B
Bristly sedge ( <i>Carex comosa</i> )	FSC/CNPS 1B
Parry's spineflower ( <i>Chorizanthe parryi</i> var. <i>parryi</i> )	FSC/CNPS 3
Parish's desert-thorn ( <i>Lycium parishii</i> )	CNPS 2
Salt spring checkerbloom ( <i>Sidalcea neomexicana</i> )	CNPS 2
Payson's jewelflower ( <i>Caulanthus simulans</i> )	FSC/CNPS 4

<b>Sensitive Wildlife</b>	<b>Status*</b>
San Bernardino kangaroo rat ( <i>Dipodomys merriami parvusi</i> )	FT/CE
Spotted bat ( <i>Euderma maculatum</i> )	FSC/CSC
Greater western mastiff bat ( <i>Eumops perotis californicus</i> )	FSC/CSC
Western yellow bat ( <i>Lasiurus ega</i> )	CSC
San Diego black-tailed jackrabbit ( <i>Lepus californicus bennetti</i> )	FSC/CSC
Ramona grasshopper mouse ( <i>Onychomys torridus ramona</i> )	FSC/CSC
Los Angeles pocket mouse ( <i>Perognathus longimembris brevinasus</i> )	FSC/CSC
Pale big-eared bat ( <i>Plecotus townsendii pallenscens</i> )	FSC/CSC
San Diego desert woodrat ( <i>Neotoma lepida intermedia</i> )	FSC/CSC
Pallid bat ( <i>Antrozous pallidus</i> )	CSC
Pocketed free-tailed bat ( <i>Nyctinomops femorosaccus</i> )	CSC
American badger ( <i>Taxidea taxus</i> )	CSC
Blue grosbeak ( <i>Guiraca caerulea</i> )	CSC
Least Bell's vireo ( <i>Vireo bellii pusillus</i> )	FE/CE
Western yellow-billed cuckoo ( <i>Coccyzus americanus occidentalis</i> )	FPLE/CE
California gnatcatcher ( <i>Poliophtila californica</i> )	FT/CSC
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	FE
Southern California rufous-crowned sparrow ( <i>Aimophila ruficeps canescens</i> )	FSC/CSC
Bell's sage sparrow ( <i>Amphispiza belli belli</i> )	FSC/CSC
Cooper's hawk ( <i>Accipiter cooperii</i> )	CSC
Sharp-shinned hawk ( <i>Accipiter striatus</i> )	CSC
Yellow warbler ( <i>Dendroica petechia</i> )	CSC
Yellow-breasted chat ( <i>Icteria virens</i> )	CSC
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	CSC
Southwestern pond turtle ( <i>Clemmys marmorata pallida</i> )	FSC/CSC
Orange-throated whiptail ( <i>Cnemidophorus hyperythrus beldingi</i> )	FSC/CSC
Red diamond rattlesnake ( <i>Crotalus ruber ruber</i> )	FSC/CSC
San Diego horned lizard ( <i>Phrynosoma coronatum</i> )	FSC/CSC
Coast patch-nosed snake ( <i>Salvadora hexalepis virgultea</i> )	FSC/CSC
Two-striped garter snake ( <i>Thamnophis hammondi</i> )	FSC/CSC
Silvery legless lizard ( <i>Anniella pulchra pulchra</i> )	CSC
Coastal western whiptail ( <i>Cnemidophorus tigris multiscutatus</i> )	FSC
California red-legged frog ( <i>Rana aurora draytonii</i> )	FT/CSC
Mountain yellow-legged frog ( <i>Rana muscosa</i> )	FSC/CSC
Santa Ana sucker ( <i>Catostomus santaanae</i> )	FT/CSC
Arroyo chub ( <i>Gila orcutti</i> )	CSC
Santa Ana speckled dace ( <i>Rhinichthys osculus</i> )	FSC/CSC
Unarmored threespine stickleback ( <i>Gasterosteus aculeatus</i> )	FE/SE
Delhi sands flower-loving fly ( <i>Rhaphiomidas terminatus abdominalis</i> )	FE

\* STATUS – FE = Federally listed Endangered; FT = Federally listed Threatened; FSC = Federal Species of Special Concern; FPLE = Federal Petition to List Endangered; FPD = Federal proposed (Delisting); CNPS List 1B = California Native Plant Society Inventory of Rare and Endangered Plants, Rare and Endangered Plants of California and elsewhere (California Native Plant Society 1994); CE = California listed Endangered, CT = California listed Threatened; CSC = California Species of Special Concern; and CFP = California Fully Protected.

A complete list of all the species of plants and wildlife that were recorded during the biological resources assessment is found in Section 6.13.1 of the AFC (MVPC 2000a).

## SITE VICINITY HABITAT DESCRIPTIONS

The proposed project will be located in an area of light industrial businesses mixed with agricultural lands. The Mountainview Power Plant, powerline towers, and two large storage tanks currently occupy the fenced site. To the north is agricultural land that is currently unplanted, and beyond that is the Santa Ana River. To the east is a Southern California Edison (SCE) switchyard, and agricultural fields. San Bernardino Avenue creates the southern boundary, beyond which are some private residences and agricultural fields. To the west of the site are residences and light industrial businesses.

### **POWER PLANT SITE AND CONSTRUCTION LAYDOWN AREA**

The existing power plant site covers 16.3 acres within a ~31-acre fenced lot. The proposed power plant site would use this land, the contiguous 31± acres that are within the existing fence line, but owned by SCE, and 7± acres to the north of the fence line that are under cultivation. The laydown area would also be within the 31± acres fenced lot.

The proposed power plant site currently supports little vegetation, and the vegetation present is ruderal or ornamental. On the north side of the proposed project site, a dense stand of cottonwood willow woodland exists along the south bank of the Santa Ana River Wash and within a channel that empties into the Santa Ana River Wash. Plant species that occur here include mature cottonwoods (*Populus fremontii*), willows (*Salix lasiolepis* and *S. gooddingii*), mulefat (*Baccharis salicifolia*) and the invasive giant reed (*Arundo donax*). A chain-link fence and earthen berm/access road separates this willow woodland from the project site. It appears that weed abatement is practiced adjacent to the berm/road, where exotic grasses (*Bromus diandrus* and *B. tectorum*) and other weedy species such as prickly lettuce (*Lactuca serriola*), horseweed (*Conyza canadensis*), fiddleneck (*Amsinckia intermedia*), and Johnson grass (*Sorghum halpense*) are present. Agricultural lands are adjacent to the north/east side of the site and south of San Bernardino Avenue (the site's southern boundary). The remaining areas to the east of the site are industrial (SCE switchyard) as well as the areas west of Mountainview Avenue. These industrial areas support no native vegetation, but some horticultural landscaping is present.

The riparian habitat along the south bank of the Santa Ana River, north of the proposed power plant expansion site, provides good to excellent foraging and nesting habitat for the least Bell's vireo, a state and federally listed endangered species.

### **TRANSMISSION LINE**

The project proposes to interconnect with the SCE-owned 230 kilovolt (kV) switchyard to the east. Because the existing power plant already supplies power to this switchyard, no new transmission lines will be necessary for the MVPP project.

## **NATURAL GAS SUPPLY PIPELINE**

The 17-mile natural gas pipeline will be routed entirely within paved streets from the Southern California Gas Company's line near Etiwanda Avenue to the MVPP project. The pipeline route will cross some significant biological resource areas including several water crossings and the Delhi sands area described below.

East Etiwanda Wash at Arrow Route contains Riversidean alluvial fan sage scrub and some riparian habitat. East Etiwanda Wash, north of Arrow Route, supports Riversidean alluvial fan sage scrub within the wide fluvial terrace. The wash narrows, where it crosses under Arrow Route. Residential development and power lines border the wash to the west. To the east, the banks support primarily ruderal annual species (a variety of brome grasses), but several native walnuts (*Juglans californica* ssp. *californica*) persist on the site. Urban runoff enters the wash just above the undercrossing, providing adequate water to allow a few small Goodding's willows (*Salix gooddingii*) and some mulefat (*Baccharis salicifolia*) to persist. This flow also supports a more dense riparian scrub within the rock riprap on the south side of Arrow Route. Species here include Goodding's and arroyo willows (*Salix lasiolepis*), mulefat and a few walnut trees. All plant communities are degraded, primarily due to illegal dumping and vehicular access. The severity of the degradation decreases with distance from Arrow Route.

Areas of remnant Delhi sands are found along Merrill Avenue, between Meridian Avenue and the Southern Pacific Railroad. These areas can potentially support the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), a federally listed endangered species.

The Santa Ana River at Tippecanoe is channelized between levees and covered with grouted riprap, but the channel is soft-bottomed. The channel contains both worked alluvium and riparian vegetation. The central part of the channel supports sparse Riversidean alluvial fan sage scrub, the low percent cover presumably due to intermittent scouring flows of the river evident by the deposition of organic material approximately three feet (one meter) above the channel bottom. Vegetation in this sparsely covered area is dominated by golden aster (*Heterotheca sessiflora*) along with annual bursage (*Ambrosia acanthicarpa*), scalebroom (*Lepidospartum squamatum*), and California buckwheat (*Eriogonum fasciculatum*). The north edge/bank is less heavily vegetated than the south edge/bank, with mulefat primarily on the north side, and mulefat, willows, cottonwood, and the invasive giant reed along the south side, just upstream of the Tippecanoe Bridge. Although populations of the federally and state-listed endangered Santa Ana woolly star occur upstream, the nearest population is approximately 1 mile north of the stream crossing at Tippecanoe. Pipeline construction will not impact this population. No other sensitive plant species were identified in the 1,000-foot corridor construction survey zone.

The patchy riparian vegetation along the north and south banks of the crossing provides marginal to good habitat for least Bell's vireo. The wash and the undeveloped agricultural lands outside the levees provide some of the highest quality San Bernardino kangaroo rat habitat in the region. Populations of this

federally and state-listed species have been confirmed at this crossing within the last year (Montgomery 2000). The Santa Ana River sucker is restricted to cool, unpolluted waters, which are not present at this crossing. In addition, the construction techniques will follow a Storm Water Prevention Plan (SWPP) to limit erosion and siltation during construction to prevent any potential impacts to this federally listed species.

### **WASTEWATER PIPELINE**

Much of the infrastructure for the wastewater pipeline is already in place. However, to connect to the Santa Ana Regional Intercept (SARI) line, approximately 1,100 feet of line will need to be installed, approximately 50 feet of which must cross Twin Creek, a tributary to the Santa Ana River. The new pipeline will likely be hung on the existing bridge, and no equipment will enter the channel (MVPC 2000kk). No sensitive plant species were identified within the 1,000-foot construction corridor survey zone in this area. This area contains a concrete drop structure, with weedy species upstream (the channel is regularly disked) and species include exotic grasses, castorbean (*Ricinus communis*), mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*) and sunflower (*Helianthus annuus*). A small freshwater marsh occurs downstream persisting for approximately 200 feet. Plant species downstream of the open water include cattails (*Typha domingensis*), Goodding's willow, white clover (*Melilotus albus*), mulefat, willow smartweed (*Polygonum lapathifolium*), umbrella sedge (*Cyperus* sp.) and rabbit's-foot grass (*Polypogon monspeliensis*). Disturbance oriented species including heliotrope (*Heliotropium curassavicum*), Mexican sprangletop (*Leptochloa uninervia*) and Bermuda grass (*Cynodon dactylon*) occur between the drop structure and the open water. The marsh may support southwestern pond turtles (*Clemmys marmorata pallida*). Prior surveys performed by the Applicant indicated the presence of turtles, but this state and federal species of special concern was not confirmed, and protocol surveys have not been performed.

### **COOLING WATER PIPELINE**

The primary sources of cooling water for the plant will be raw well water. However, if secondary effluent is needed, MVPP will connect with the City of Redlands Wastewater Treatment Plant through the pipeline that the City is installing into San Bernardino Avenue. The City plans to sell this water to several customers.

Currently the Wastewater Treatment Plant drains its tertiary-treatment water into a percolation pond near the Santa Ana River, upstream of the project site. This effluent percolates to the groundwater because it is not of high enough quality to discharge into surface water (Phelps 2000).

Because the City will be performing it's own environmental analysis, the cooling water pipeline will not be discussed further in this staff report.

## IMPACTS

### PROJECT SPECIFIC DIRECT IMPACTS

The California Environmental Quality Act Guidelines defines direct impacts as those impacts that are a result of the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance, but are still reasonably foreseeable and related to the project. Indirect impacts are discussed in a separate section below.

Loss of sensitive species habitat is the primary concern of staff since conversion of habitat to agricultural and urban development is so prevalent in this area. The following table (Biological Resources Table 2) identifies the MVPP direct acreage impacts to wildlife habitat or sensitive plant communities.

**BIOLOGICAL RESOURCES - Table 2**  
**ACREAGE IMPACTS**  
(MVPC 2000a)

<b>Project facility</b>	<b>Permanent Impacts Acreage</b>	<b>Temporary Impacts Acreage</b>
Proposed Power Plant Site	18.7	0
Transmission Line	0 <sup>1</sup>	0
Wastewater Pipeline	0	2.31 <sup>2</sup>
Natural gas pipeline		
River Crossings	0	0.23 <sup>3</sup>
Delhi Sands (Alt. 1-Proposed Route)	0	24.2 <sup>4</sup>
Staging area for natural gas pipeline	0	0.99 <sup>5</sup>
<b>IMPACT ACREAGE TOTALS</b>	<b>18.7-acres</b>	<b>27.73-acres</b>

1. Project assumes no changes will be required
2. Disturbance occurs within a golf course
3. Assumes a 20-foot ROW within East Etiwanda Wash; no impact to Twin Creek or Santa Ana River anticipated with the proposed crossing method
4. The installation occurs under pavement with a trench size of 36 inches, although this number assumes a 100-foot impact zone for the full 2-mile length. There is only 0.1 acres of impact off of paved or covered (sidewalk) areas. The other alternative route does not cross Delhi sands.
5. Staging at East Etiwanda Wash is 0.09 acres, and at Santa Ana River is 0.9 acres, but in both cases the habitat is degraded or in intensive use (e.g., agriculture).

The proposed project may directly impact a variety of sensitive species known to occur in the project vicinity. To address any concerns about these potential impacts, the Applicant has proposed a variety of mitigation measures they intend to employ to minimize or totally avoid impacting individual sensitive species (MVPC 2000a). The final list of mitigation measures and implementation methods will be included in the project's Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMIP). For more information on specific mitigation measures

and the project's BRMIMP, refer to Biological Resources Condition of Certification **BIO-6**.

### ***POWER PLANT SITE AND LAYDOWN AREA***

The current power plant site has no biological resources; therefore no biological resource impacts are expected. However, the land to the north of the project does have some burrowing activity and could support burrowing owls. The potential for losses here will need to be evaluated by a protocol survey prior to construction (see Biological Resources Condition of Certification **BIO-7**).

### ***NATURAL GAS PIPELINE***

The pipeline route has the potential to impact several watercourse crossings including East Etiwanda Wash and the Santa Ana River. Direct losses of degraded riparian habitat are likely at East Etiwanda Wash (0.23 acre) if the pipeline is trenched. If the pipeline were bored, the staging areas, outside of the channel, would temporarily impact 0.09 acres of paved surfaces or hard-packed soil. The directional drill site at Tippecanoe would be evaluated for impacts on San Bernardino kangaroo rat, which is known to occur at the site (see Biological Resources Condition of Certification **BIO-8**). The staging areas at Santa Ana River would be 0.9 acres; however, all work is expected to be done in plowed fields or commercial space outside of the channel (MVPC 2000II).

Temporary impacts to Delhi sands soils are expected under the proposed natural gas pipeline route (Alternate Route 1). Alternate Route 1 would temporarily impact 24.2 acres (only 0.1 acre off of paved or covered surfaces). Alternate Route 3 would have no impacts because it does not cross Delhi sands soils. Alternate Route 2 has been eliminated from consideration.

### ***TRANSMISSION LINE***

There will be no construction of transmission lines for the proposed power plant, so no impacts are anticipated. New connections to the existing adjacent SCE-owned 230 kilovolt (kV) switchyard will be added as part of the proposed project.

### ***WASTEWATER PIPELINE***

The construction of the wastewater pipeline has the potential to impact Twin Creek, a tributary to the Santa Ana River, only if the proposed pipeline attachment to the golf course footbridge becomes unfeasible. The drop structure has allowed a wetland to develop on the south side of the bridge, and this habitat is protected by the U.S. Army Corps of Engineers. Sensitive wildlife species (including southwestern pond turtle) may be using the site and could be disturbed during construction. The Applicant is restricting all work to the north side of the bridge or on the bridge itself to avoid impacts, and will be installing silt fencing as a temporary barrier to wildlife (MVPC 2000II).

### ***INDIRECT IMPACTS***

Staff identifies no indirect impacts.

## IMPACTS TO DESIGNATED GNATCATCHER HABITAT

The USFWS identified critical habitat for the California gnatcatcher on February 7, 2000 (USFWS 2000a). Several segments of the Santa Ana River to the east of the power plant, approximately 1.5 miles upstream, are proposed for critical habitat designation. Because no removal of gnatcatcher habitat will occur with the construction of the power plant or its ancillary facilities, no impacts are expected.

## IMPACTS TO DESIGNATED WOOLLY STAR PRESERVES

The U.S. Army Corps of Engineers has designated parcels of land within the Santa Ana River as woolly star preserves as mitigation for the installation of the Seven Oaks Dam. The nearest preserve is approximately 1.5 miles upstream of the power plant. There are no impacts anticipated to this preserve area.

## IMPACTS OF NITROGEN DEPOSITION

The USFWS has expressed concern that the project's power plant emissions may result in increased nitrogen levels in the soils (USFWS 2000b). Many plant communities are supported by soils that are nitrogen poor, and these communities respond strongly to additions of nitrogen by changing their productivity, species composition and nutrient retention (Weiss 1999). Air pollution can act as a nitrogen fertilizer by depositing either wet (rain, fog, snow) or dry (gases, particles) substances from the atmosphere onto the plant communities. The nitrogen types responsible for dry deposition (the most likely form of deposits in the dry San Bernardino environment) are (1) nitrogen dioxide ( $\text{NO}_2$ ), (2) nitric acid vapor ( $\text{HNO}_3$ ), (3) ammonia ( $\text{NH}_3$ ), (4) particulate nitrate ( $\text{pNO}_3^-$ ), and (5) particulate ammonium ( $\text{pNH}_4^+$ ). Studies in the areas of San Francisco and San Jose, California have found that nitrogen deposition from air pollution on serpentine soils, as described in Biological Resources Table 3, are high enough to act as a fertilizer and enhance the growth of annual grasses at the expense of native annual forbs (Weiss 1999).

**BIOLOGICAL RESOURCES - Table 3**  
**Annual Average Concentrations of Nitrogen Types at Selected**  
**Air Pollution Monitoring Stations**  
(Weiss 1999, MVPC 2000a)

<b>San Francisco and San Jose<sup>1</sup></b>				
	San Francisco	San Jose3	San Jose2	San Jose1
$\text{NO}_2$ (ppm)	0.022	0.025	0.026	0.027
$\text{pNO}_3^-$ (ug/m3)	2.5	4.9	4.6	No data
$\text{O}_3$ (ppm)	0.016	0.014	0.016	0.019
<b>San Bernardino at 4<sup>th</sup> Street</b>				
	Avg (1990-1996)		High	Low
$\text{NO}_2$ (ppm)	0.037		0.041	0.036
$\text{pNO}_3^-$ (ug/m3)	No data			
$\text{O}_3$ (ppm) <sup>2</sup>	0.24		0.29	0.20

1. Data summarized from the California Air Resources Board (CARB) 1990-1996

2. Only highest 1-hour average is available from the CARB for this monitoring station

The Applicant estimates that emissions from the project's power plant will be  $0.61 \mu\text{g}/\text{m}^3$  of  $\text{NO}_2$ , which is 22 to 28 times the level found adequate to produce a fertilizer effect in serpentine soils. However, unlike the Hanford and Tujunga soils that surround the plant site (MVPC 2000a, Figure 6.15-1c), serpentine soils lack essential fertilizing elements such as nitrogen, potassium, and phosphorous. In addition, current levels of nitrogen deposition in the area's soils (attributable to dry deposition from urbanized areas; Allen et al. 1998 cited in MVPC 2000II) make the MVPP contribution quite low (0.6 to 6.0 percent above existing concentrations depending on distance from plant; MVPC 2000II). Finally, the distance where nitrate deposition could begin to occur is likely to be at least 10 miles west (based on the predominant wind direction) from the power plant (MVPC 2000II). The closest biological resource at that bearing is Delhi sands soils (about 6 miles northwest from the plant). Delhi sand soils would receive a minimal amount of deposition; the amount of  $\text{NO}_2$  in the vicinity of the Delhi sand soils is estimated at  $0.1 \mu\text{g}/\text{m}^3$  or less (MVPC 2000II). In light of these three arguments, staff feels the likelihood of the power plant's nitrogen emissions spurring the rapid invasion of the surrounding area by introduced grasses at the expense of sensitive native plants is unlikely.

## CUMULATIVE IMPACTS

The California Environmental Quality Act defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." (CEQA Guidelines, Section 15355). Cumulative impacts can occur when individually minor but collectively significant projects take place at the same time or compound an impact.

The installation of the power plant will continue to increase the urban pressure to the Santa Ana River near the Tippecanoe crossing. Although the disturbance of some riparian habitat by itself is a minor impact, the compound impact of bridge installation and other pipeline installations at the same time could create a significant disturbance to riparian habitat in the Santa Ana River. At present, there are no anticipated development projects within a 1-mile buffer of these crossings (MVPP 2000), so no cumulative impacts are anticipated.

## FACILITY CLOSURE

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Sometime in the future, the MVPP and ancillary facilities will either experience a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM). Facility closure mitigation measures will also be included in the BRMIMP (see Biological Resources Condition of Certification **BIO-11**).

## **PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE**

The proposed expansion of the existing power plant is located in a region of agricultural and light industrial uses. The closure of the plant would not require restoration in light of the urbanization of the area. To address facility closure, an “on-site contingency plan” will be developed by the project owner, and approved by the Energy Commission. Facility closure mitigation measures will also be included in the BRMIMP (see Biological Resources Condition of Certification **BIO-6**).

## **UNEXPECTED TEMPORARY CLOSURE**

Staff does not have any biological resource facility closure recommendations if an unexpected temporary closure of the MVPP power plant occurs. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the above-mentioned facility closure measures need to be given careful consideration.

## **MITIGATION**

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### **APPLICANT’S PROPOSED MITIGATION**

The Applicant has developed a mitigation strategy that seeks to maximize avoidance of impacts to sensitive species and their habitat (MVPC 2000a). MVPC’s proposed mitigation measures include items such as avoidance of riparian vegetation, implementation of a worker environmental awareness program, and the design of features to protect species from harm.

### ***IMPACT AVOIDANCE MEASURES***

The Applicant has recommended the following wildlife impacts avoidance measures be implemented:

**At the Arrow Route crossing of East Etiwanda Wash the following conditions will apply:**

- Pre-construction surveys at East Etiwanda Wash will be conducted by a qualified biologist familiar with the sensitive species and their habitats found in Biological Resources Table 1;
- Surveys for reptiles and amphibians will be conducted when these species are known to be active;
- The work area for the gas pipeline will be flagged or fenced to prevent construction equipment from disturbing adjacent areas; and
- Staging areas at East Etiwanda Wash will be restricted to unvegetated (bare soil or paved) lots and will not encroach on the wash.

**At Tippecanoe Avenue crossing of the Santa Ana River the following conditions will apply:**

- The Applicant will conduct an appropriate number of surveys, according to the USFWS survey protocols, for least Bell's vireo, southwestern willow flycatcher, San Bernardino kangaroo rat, and other sensitive species prior to construction (April through mid-August). In those surveys, the location of sensitive wildlife resources (species and their habitats) will be depicted and designated for avoidance on project construction maps;
- Construction at this crossing will be timed to avoid the nesting season of most birds (e.g., between late June and November);
- Installation at this crossing will be monitored by a qualified biologist(s) or their designee for the duration of construction for species potentially present (Biological Resources Table 1). Monitoring will include daily inspections of the work area prior to construction start-up to remove wildlife out of harms way;
- Habitat disturbance will be mitigated by a restoration and revegetation program, whose goal will be the replacement of similar native, locally collected plants, and the control of invasive, non-native plant species in the work area;
- The work areas will be delimited with silt fencing or other erosion control structures to limit or prevent excavated sediment from entering surface waters in the Santa Ana River;
- During pipeline construction, the upper 12 inches of topsoil will be salvaged and replaced when the pipeline is trenched through open space at either end of the Tippecanoe Avenue Bridge; and
- Trenching in the riverbed is not expected (MVPC 2000k); however, if it becomes necessary, any diversion of surface flows will utilize "in-the-dry" crossing methods. Saturated spoils that are excavated from the trench line will be stockpiled and surrounded with silt fencing to reduce sedimentation. Diverted flows and groundwater dewatering efforts will incorporate certified weed-free hay bales or other structures, such as silt fencing, to reduce turbidity before water is returned to the streambed.

**At the Twin Creek crossing the following conditions will apply:**

- The wastewater pipeline will be hung from the existing golf-course foot bridge;
- Approach to the bridge and equipment use will be confined to the north side of the footbridge. Scour pools and riparian areas would be avoided on the south side of the bridge;
- Work areas in the creek and adjacent upland areas would be defined by the installation crew and would be minimized in the creek bed to the maximum extent practical;
- Work areas would be enclosed in silt fencing and construction safety fencing to preclude the ingress of small animals;
- A qualified biologist would walk ahead of silt fence installation crew to remove any herptiles that may be present and check daily to remove herptiles from the enclosed work areas;

- Fencing would only remain in place as long as necessary to complete the work and would be removed as soon as all construction is completed, cleanup is finalized, and all construction equipment has been removed;
- Sightings of southwestern pond turtle or other sensitive wildlife during the pipeline installation would be reported by the Designated Biologist to the appropriate agencies (USFWS and CDFG);

**For construction in the Delhi Sands Unit, the following conditions will apply:**

- The area of Delhi sands will be delimited prior to construction with stakes and flagging;
- Additional precautions to minimize the spillage of dirt and debris onto unpaved areas will be taken;
- No staging areas will be located within unpaved section of the Delhi Sands Unit; and,
- Immediately after pipeline installation is completed, any disturbance of soil will be returned to its prior state to the extent practical.

**At all construction locations:**

- All construction vehicles (including cars and trucks) will be equipped with operating mufflers and will be cleaned using water or compressed air to remove all debris, and be weed-free prior to access to the pipeline corridor. If equipment leaves the corridor for the night, then this procedure must be repeated;
- Topsoil in the open space along the proposed pipeline route will be salvaged and stored in an appropriate manner, where it does not impact existing natural areas or become contaminated with exotics. Additionally, if topsoil is to be stored for longer than 1 month, it will not be stockpiled in piles taller than 3 feet, to prevent composting of organic materials;
- Prior to clearing vegetation, areas will be inspected for noxious weeds. Areas with high weed infestation will have their topsoil used as backfill and topsoil will not be used in surface application;
- All straw (bales or loose) or hydromulch will be certified as weed-free;
- Erosion control devices at rivers, washes, drainage channels, ravines, and other water courses will be installed;
- Prior to construction, an Erosion Control, Revegetation, and Landscaping Plan will be developed to specify and plan, by location, the seed mixes and their collection and methods of application to be used in revegetation. Each seed mix will consist of native species collected from natural stands of native vegetation immediately adjacent to the pipeline route at East Etiwanda Wash and the Santa Ana River crossing at Tippecanoe Avenue. Along roadsides elsewhere on the proposed pipeline route, the landowner or managing agency

may approve alternatives seed mixes or impose their own requirements for revegetation;

- A qualified biological monitor, or their designee, will inspect the work site, including store pipe, prior to commencement of construction each day;
- When working within or adjacent to any watercourse, ravine, etc., the contractor will have an emergency spill containment kit to contain and remove spilled fuels, hydraulic fluids, etc. Likewise, equipment re-fueling or storage of these materials will not occur within 500 feet of any surface water;
- The results of pre-construction surveys within 1,000 feet of all project components would be mapped. Maps would depict sensitive area to be avoided;
- Avoidance areas would be established for all sensitive plant and wildlife occurrences in or near the construction impact zone. Metal or other strong stakes connected by rope or other visible fencing would identify the avoidance areas with flagging to increase visibility, as appropriate. Avoidance areas would be marked no more than 14 days prior to construction in an area and would be maintained until construction activities have been completed. Markers would be removed promptly when construction in the area has been fully completed, all cleanup activities are finished, and all construction equipment has been removed; and
- Biological monitors would be provided, as needed, to ensure avoidance areas are properly observed and maintained.

### ***DESIGNATED BIOLOGIST***

A qualified biologist will be designated to monitor all construction activities along East Etiwanda Wash and the Tippecanoe crossing. A qualified biological monitor or their designee will inspect the work site, including stored pipe, prior to commencement of construction each day.

### ***SENSITIVE PLANT AND WILDLIFE SURVEYS***

As detailed in the draft BRMIMP (MVPC 2000II), the Applicant will perform surveys for sensitive plants and wildlife at East Etiwanda Wash and Santa Ana River prior to construction. The pre-construction survey effort will include San Bernardino kangaroo rat (see Biological Resources Condition of Certification **BIO-8**) and Payson's jewelflower (*Caulanthus simulans*) that was not surveyed for in 1999 (see Biological Resources Condition of Certification **BIO-9**).

### ***USFWS CONSULTATION OR APPLICATION FOR INCIDENTAL TAKE PERMIT***

The Applicant does not anticipate the need for any federal agency to initiate consultation with the USFWS because they anticipate complete avoidance of "take". If however, the directional drill proposed by the Applicant at the Tippecanoe Avenue crossing of the Santa Ana River fails, and trenching becomes the only option, then USFWS consultation on the Section 404 permit will be necessary. If impacts to federally-listed species cannot be avoided, but no federal permits will be issued, then the Applicant will need to apply for an Incidental Take Permit. The conditions

of the Section 404 and USFWS consultation will become part of the BRMIMP (see Biological Resources Condition of Certification **BIO-6**).

### ***CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT***

The Applicant has correctly identified that construction of the natural gas pipeline at Etiwanda Wash will require the acquisition of a Streambed Alteration Agreement from the California Department of Fish and Game per §1601/1603 of the Fish and Game Code. As noted above, if the directional drill became infeasible at the Santa Ana River, a Streambed Alteration Agreement for this crossing would also be necessary.

### ***BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN***

The Applicant has agreed to submit a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for review and comment by the Energy Commission, the USFWS, CDFG, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, San Bernardino County, and City of San Bernardino prior to the start of any ground disturbance activity. The draft BRMIMP submitted to the Energy Commission (MVPC 2000II) covers the mitigations measures recommended by the Applicant, the permits they expect to obtain, the responsibilities of the parties involved, and the lines of communication. The worker environmental awareness program was included in the draft BRMIMP.

## **STAFF'S RECOMMENDED MITIGATION**

### ***IMPACT AVOIDANCE MEASURES***

The Applicant's recommended sensitive species' impact avoidance measures have gone far in reducing potential impacts. However, burrowing owl, San Bernardino kangaroo rat, Payson's jewelflower, and southwestern pond turtle have not been surveyed for in the project area, and additional surveys, and possibly mitigation, may be necessary if they are discovered (see following paragraph).

### ***SENSITIVE PLANT AND WILDLIFE SURVEYS***

As presented in the AFC (MVPC 2000a) and response to data request (MVPC 2000k and 2000kk), surveys for sensitive plant and wildlife were performed in the summer and fall of 1999. No federal and/or state listed endangered plants were located on the proposed project site; however, two species (Santa Ana woolly star and bristly sedge) were noted as having the potential to occur or were documented within one mile of the proposed power plant expansion and 1,000 feet of a pipeline, respectively.

The Applicant did not perform protocol surveys in 1999 for: burrowing owl (see **BIO-7**); San Bernardino kangaroo rat at the Tippecanoe Avenue crossing (see **BIO-8**); Payson's jewelflower (see **BIO-9**); or, southwestern pond turtle (see **BIO-10**). Staff recommends these surveys take place prior to construction to ensure no impact to sensitive species would result from the proposed project's construction or operation.

Habitat compensation was considered by staff, but is not proposed at this time. The Applicant will need to survey for San Bernardino kangaroo rat to ensure that the directional drill at the Tippecanoe crossing of the Santa Ana River can be completed with total avoidance and continue to monitor at other biologically sensitive locations. The Applicant should continue to work closely with USFWS and CDFG as surveying and monitoring at Etiwanda Wash, Santa Ana River, and the Delhi Sands Unit is completed (see **BIO-16**).

### ***USFWS CONSULTATION OR APPLICATION FOR INCIDENTAL TAKE PERMIT***

Staff supports the involvement of the USFWS on the project. The Applicant has walked the site with USFWS, and is confident that no consultation or application for an Incidental Take Permit will be required. However, future trapping surveys for San Bernardino kangaroo rat at the directional drill crossing of the Santa Ana River are necessary to confirm this assumption. If the directional drill cannot be completed with total avoidance, then the Applicant will need to initiate USFWS consultation, most likely under Section 7 with the U.S. Army Corps of Engineers as the lead agency. If the Applicant enters into consultation or submits an application for an Incidental Take Permit, the official Biological Opinion or Incidental Take Permit should be provided to the Energy Commission Compliance Project Manager and the BRMIMP updated to include any of the conditions suggested by USFWS.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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To be in compliance with applicable laws, ordinances, regulations and standards, MVPP may need to obtain permits or clearances from state and federal agencies. For example, a California Streambed Alteration Agreement will be required for crossing Etiwanda Wash. These documents may identify mitigation measures required by each regulatory agency. For more information on these documents, see Biological Resources Condition of Certification **BIO-6**.

To make certain the project owner complies with all laws, ordinances, regulations, and standards and the biological resource mitigation measures associated with this project, the Applicant must designate a biological resource specialist, prior to the beginning of any project-related ground disturbance, who is familiar with the biological resource issues of the MVPP project. This specialist, identified as the Designated Biologist, will help ensure that all biological resources mitigation measures are complied with during project construction and operation. For more information about the roles and responsibilities of the Designated Biologist, see Biological Resource Conditions of Certification **BIO-2**, **BIO-3**, and **BIO-4**.

## UNRESOLVED ISSUES, CONCLUSIONS, AND RECOMMENDATIONS

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### UNRESOLVED ISSUES

#### ***FEDERAL BIOLOGICAL OPINION OR INCIDENTAL TAKE PERMIT***

The Applicant will need to initiate an USFWS consultation or apply for an Incidental Take Permit if the directional drill crossing of the Santa Ana River cannot be completed with total avoidance of San Bernardino kangaroo rat or its habitat. The Applicant will include any conditions recommended by the USFWS in the BRMIMP.

#### ***CDFG INCIDENTAL TAKE PERMIT AND STREAMBED ALTERATION AGREEMENT***

On October 12, 2000, Robin Mahoney-Rames contacted staff to discuss the proposed project. CDFG intends to review this staff assessment and provide written comments by the end of October 2000.

It is uncertain at this time what CDFG has determined regarding the proposed project and the potential for impacts. As proposed, the MVPP project appears to be able to nearly completely avoid biologically sensitive habitat, so no consultation on state-listed species with CDFG is expected to be necessary. However, if the directional drill crossing of the Santa Ana River or other ancillary facilities cannot be completed with total avoidance of species habitat, or construction activities may impact state-listed species, a state Incidental Take Permit would be needed. The Applicant still needs to acquire a CDFG Streambed Alteration Agreement.

#### ***SENSITIVE PLANT AND WILDLIFE SURVEYS***

Additional surveys for burrowing owls north of the proposed power plant site must be completed prior to construction, and appropriate mitigation implemented if this species is found.

The staging areas for the directional drill of Tippecanoe Avenue need to have a trapping survey for the San Bernardino kangaroo rat prior to construction.

Surveys for Payson's jewelflower also need to be completed at all streambeds prior to construction. This annual species blooms from March to June, so surveys can not be started until next spring. This could be a problem for project construction if the Applicant wants to start construction prior to completion of the field surveys.

An unidentified turtle was seen during the project's field surveys; however an exact identification was not provided. The Twin Creek area needs to be re-checked, and a final determination of whether the southwestern pond turtle is present needs to be provided prior to construction.

#### ***FEDERAL CLEAN WATER ACT SECTION 404 AND STATE SECTION 401 CERTIFICATION***

The Section 404 permit and 401 certification are required to comply with provisions of the federal and state Clean Water Acts. The Applicant would only pursue a

Section 404 Permit under the Clean Water Act by the U.S. Army Corps of Engineers if its work within the Santa Ana River cannot be completed by directional drill. If this becomes the case, the Applicant would need to include the permit terms and conditions in the BRMIMP.

### ***BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)***

Staff has received and reviewed the draft BRMIMP submitted as a response to the second round of data requests. After receiving staff and agency comments, the Applicant must make all necessary improvements to the plan, prior to the MVPP Evidentiary Hearings.

## **CONCLUSIONS**

The completion of San Bernardino kangaroo rat surveys prior to the directional drill will be important for resolution of the Applicant's ability to avoid all impacts. The high amount of disturbed land makes it likely that the Applicant can find locations for its directional drill staging areas that do not cause direct impacts to San Bernardino kangaroo rat or its habitat. The successful completion of the directional drill will also eliminate concerns that a Section 404 and 401 permit will be needed.

Staff and various agencies have come to general agreement with the Applicant on the mitigation and compensation that will be necessary to ensure the project is constructed and operated in compliance with various state and federal laws, ordinances, regulations, and standards. Based on these discussions, staff recommends that the Energy Commission committee adopt the following Biological Resources Conditions of Certification.

## **CONDITIONS OF CERTIFICATION**

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At this time, staff proposes several Biological Resources Conditions of Certification.

**BIO-1** The project owner will implement the following mitigation measures as identified in Section 6.13.4 found on pages 6.13-48 through 6.13-50 of the MVPP Application for Certification (MVPC 2000a), Section 6.2 of the Biological Assessment (MVPC 2000a, AFC Appendix J), and within the draft Biological Resources Mitigation Implementation and Monitoring Plan (MVPC 2000II). The project owner's mitigation measures will be incorporated into the final Biological Resources Mitigation Implementation and Monitoring Plan (see Condition of Certification **BIO-6** below) unless the mitigation measures conflict with any future mitigation that may be required by the USFWS and CDFG.

**At the proposed power plant expansion the following conditions will apply:**

- The project owner will minimize light and noise to the extent possible.

**Verification: At the Arrow Route crossing of East Etiwanda Wash the following conditions will apply:**

- Pre-construction surveys for sensitive species at East Etiwanda Wash will be conducted prior to construction;
- The work area for the gas pipeline will be flagged or fenced; and
- Staging areas at East Etiwanda Wash will be restricted to unvegetated (bare soil or paved) lots and will not encroach on the wash.

**At Tippecanoe Avenue crossing of the Santa Ana River the following conditions will apply:**

- Sensitive species surveys will be completed prior to construction;
- Construction at this crossing will be timed to avoid the nesting season of most birds (e.g., between late June and November);
- Construction will be monitored by a qualified biologist(s) or their designee;
- Habitat disturbance will be mitigated by a restoration and revegetation program;
- The work areas will be delimited with silt fencing or other erosion control structures;
- During pipeline construction topsoil will be salvaged and replaced; and
- Trenching in the riverbed is not expected (MVPC 2000k); however, if it becomes necessary, any diversion of surface flows will use techniques to reduce sediment.

**At the Twin Creek crossing the following conditions will apply:**

- The wastewater pipeline will be hung from the existing golf-course foot bridge;
- Equipment use will be confined to the golf course, the roadbed, the bridge, or the wash on the north side of the foot bridge;
- Work area will be located to avoid the creek bed, side slopes, and upland areas with friable (loose) soils if construction occurs during the summer months;
- Work areas would be enclosed in silt fencing and construction safety fencing which will be monitored by the Designated Biologist or their designee; and
- Sightings of southwestern pond turtle or other sensitive wildlife during the pipeline installation will be reported by the Designated Biologist to the appropriate agencies (USFWS and CDFG);

**For construction in the Delhi Sands Unit, the following conditions will apply:**

- The area of Delhi Sands will be delimited prior to construction with stakes and flagging; and
- While doing construction in Delhi Sands Unit, additional precautions will be taken under the guidance of a qualified biologist, to minimize impacts to Delhi Sands.

**At all construction locations:**

- All construction vehicles (including cars and trucks) will be equipped with operating mufflers and will be cleaned of debris prior to access to the pipeline corridor;
- Topsoil will be salvaged and stored in an appropriate manner;
- Weed control techniques will be used at all sites;
- Erosion control devices at rivers, washes, drainage channels, ravines, and other water courses will be installed;
- Prior to construction, an Erosion Control, Revegetation, and Landscaping Plan will be developed with the landowner or managing agency;
- A qualified biological monitor, or their designee, will inspect the work site prior to commencement of construction each day;
- When working within or adjacent to any watercourse, ravine, etc., the contractor will have an emergency spill containment kit, and equipment re-fueling or storage of these materials will be restricted near surface water; and
- Avoidance areas will be delineated for all sensitive plant and wildlife occurrences in or near the construction impact zone.

**Verification:** : At least 60 days prior to the start of any project related ground disturbance activities, the project owner shall provide the Energy Commission Compliance Project Manager (CPM) with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. Implementation of the above measures must be included in the BRMIMP.

**DESIGNATED BIOLOGIST**

**BIO-2** Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than Energy Commission approved geotechnical work) shall not begin until an Energy Commission CPM approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

1. A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. At least three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. At least one year of field experience with biological resources found in or near the project area; and

4. An ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

**Verification:** At least 90 days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

**BIO-3** The CPM approved Designated Biologist shall perform the following during project construction and operation:

1. Advise the project owner's Construction Manager on the implementation of the Biological Resource Conditions of Certification;
2. Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species; and
3. Notify the project owner and the CPM of non-compliance with any Biological Resources Condition of Certification.

**Verification:** During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

**BIO-4** The project owner's Construction Manager shall act on the advice of the Designated Biologist to ensure conformance with the Biological Resources Conditions of Certification.

**Protocol:** Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

- Inform the project owner and the Construction Manager when to resume construction, and
- Advise the Energy Commission CPM if any corrective actions are needed or have been instituted.

**Verification:** Within two working days of a Designated Biologist notification of non-compliance with a Biological Resources Condition of Certification or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

## **WORKER ENVIRONMENTAL AWARENESS PROGRAM**

**BIO-5** The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about the sensitive biological resources associated with the project area.

**Protocol:** Protocol: The Worker Environmental Awareness Program must:

- Be developed by the Designated Biologist and consist of an onsite or training center presentation in which supporting written material is made available to all participants;
- Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
- Present the reasons for protecting these resources;
- Present the meaning of various temporary and permanent habitat protection measures; and
- Identify whom to contact if there are further comments and questions about the material discussed in the program.
- The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.
- Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

**Verification:** : At least 60 days prior to the start of any rough grading or the directional drill at the Santa Ana River and East Etiwanda Wash, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

## **BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN**

**BIO-6** The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and shall implement the measures identified in the plan.

Protocol: Protocol: The final BRMIMP shall identify:

- All biological resources mitigation, monitoring, and compliance conditions included in the Energy Commission's Final Decision;
- All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;
- All mitigation measures identified in the USFWS Letter of Concurrence or Section 7 Biological Opinion (if applicable);
- All mitigation measures identified in the CDFG Section 2081 Incidental Take Permit (if applicable);
- Terms and conditions contained in the project's federal 404 and state 401 certification (if applicable)
- All mitigation measures identified in the CDFG Streambed Alteration Agreement;
- Required habitat compensation strategy, including provisions for acquisition, enhancement and management, for any temporary or permanent loss of sensitive biological resources (if applicable);
- Duration for each type of monitoring and a description of monitoring methodologies and frequency;
- Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
- All performance standards and remedial measures to be implemented if performance standards are not met;

- Any landscaping plans proposed to visually screen the project and enhance adjacent wildlife habitat;
- A discussion of biological resource-related facility closure measures; and
- A process for proposing plan modifications to the Energy Commission CPM and appropriate agencies for review and approval.

**Verification:** At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved BRMIMP must be made only after consultation with Energy Commission staff and the USFWS and CDFG. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

## **BURROWING OWL SURVEYS**

**BIO-7** The Applicant shall survey for burrowing owl activities, in the parcel north of the existing power plant site and at any directional drill sites, 30 days prior to project construction to assess owl presence and need for further mitigation. If owls are present, and nesting is not occurring, owls are to be removed per CDFG-approved passive relocation. Passive relocation is recommended from September 1 to January 31, to avoid disruption of breeding activities. If owls are nesting, nest should be avoided by a minimum of a 250-foot buffer until fledging has occurred (February 1 through August 31). Following fledging, owls may be passively relocated.

If burrowing owls are found on the site, off-site compensation for losses will be required. CDFG recommends 6.5 acres of protected lands for each pair of owls or unpaired resident bird. In addition, existing unsuitable burrows on the protected lands should be enhanced (i.e., cleared of debris or enlarged) or new burrows installed at a ratio of 2:1.

**Verification:** At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine if the plan includes this measure. All modifications to the approved BRMIMP must be made only after consultation with Energy Commission staff, the USFWS, and CDFG. The project owner shall notify the CPM five working days before implementing any modifications to the BRMIMP.

## **SAN BERNARDINO KANGAROO RAT SURVEYS**

**BIO-8** A qualified biologist shall complete a trapping survey for San Bernardino kangaroo rat prior to establishing the directional drill staging areas on either side of the Tippecanoe crossing of the Santa Ana River. Pre-construction surveys would be conducted April through mid-August. Surveys would map all areas of San Bernardino kangaroo rat habitat as off-limits to all construction. If the directional drill staging areas cannot be installed without complete avoidance, as determined and verified in writing by USFWS staff, the Applicant shall submit a Biological Assessment or application for an

Incidental Take Permit to USFWS for guidance to address potential impacts to this species.

**Verification:** At least 80 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final survey results for San Bernardino kangaroo rat, and documentation that the USFWS has reviewed the survey results. All areas off-limits to construction shall be clearly mapped and maps placed within the BRMIMP. At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine if the plan includes the habitat avoidance map and sufficient measures to prevent construction equipment or personnel from entering sensitive areas (e.g., flagging and signs). If complete avoidance cannot be accomplished, then the CPM shall be given a copy of the Biological **Assessment** or application for Incidental Take Permit, and the Biological Opinion or Incidental Take Permit from the USFWS, before the initiation of construction at this site.

## **PAYSON'S JEWELFLOWER SURVEY**

**BIO-9** A qualified biologist shall survey for Payson's jewelflower at all streambed crossings. Pre-construction surveys will be conducted April through mid-August. If any plants are found, they will be marked with stakes, and avoided by all construction equipment.

**Verification:** At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine if the plan includes this measure. All modifications to the approved BRMIMP must be made only after consultation with Energy Commission staff, the USFWS, and CDFG. The project owner shall notify the CPM five working days before implementing any modifications to the BRMIMP.

## **SOUTHWESTERN POND TURTLE SURVEY**

**BIO-10** A qualified biologist will conduct a survey for the southwest pond turtle during appropriate season (spring/summer) and optimal weather conditions when the species is likely to be detected. If southwestern pond turtles are found, and construction must take place between April 1 and September 1 (nesting season), then avoidance areas will be established with silt fencing per Biological Resources Condition of Certification **BIO-1**. If southwestern pond turtles are found, and construction will take place outside of those dates, then silt fencing will not be needed.

**Verification:** At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine if the plan includes this measure. All modifications to the approved BRMIMP must be made only after consultation with Energy Commission staff, the USFWS, and CDFG. The project owner shall notify the CPM five working days before implementing any CPM approved modifications to the BRMIMP.

## FACILITY CLOSURE

**BIO-11** The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the Mountainview Project BRMIMP.

Protocol: The planned permanent or unexpected permanent closure plan will include a discussion of the feasibility of the following biological resource-related mitigation measures:

1. Removal of all power plant site facilities; and
2. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.

Verification: : At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

## REFERENCES

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# SOIL AND WATER RESOURCES

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## INTRODUCTION

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This section of staff's Staff Assessment (SA) analyzes potential effects on soil and water resources that could result from construction and operation of the expanded power plant proposed by the Mountainview Power Company, LLC (MVPC), specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect surface and groundwater supplies, and degrade surface and groundwater quality. Also addressed by staff in this analysis is the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards (LORS). Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends conditions of certification.

Flooding and drainage issues are addressed in the **Geology and Paleontology** chapters of this document. Solid waste disposal is discussed in the Waste Management section of this SA.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

#### ***CLEAN WATER ACT***

The Clean Water Act (33 USC § 1251), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. Section 1257 et seq. of the Act requires states to set standards to maintain, restore, and protect water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated through requirements under Section 402 of the Clean Water Act. Section 402(p) established the National Pollutant Discharge Elimination System (NPDES) permitting program for stormwater and incidental non-stormwater discharges from construction activities that disturb five (5) or more acres of soil. In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCB). Stormwater discharges during construction and operation of a facility are addressed through General Construction Activity and Industrial Activity NPDES permits

Discharges of fill or dredged material into waters of the United States, including rivers, streams, and wetlands are covered under Section 404 of the Clean Water Act. The Section 404 permit program is administered by the U.S. Army Corps of Engineers (ACOE). Utility crossings (including pipelines constructed across waterways) are activities that would be regulated under Section 404 of the Clean Water Act.

## **STATE**

### ***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 Water Quality Control Plan for the Santa Ana River Basin (1995). The Porter-Cologne Water Quality Control Act also requires the SWRCB and the nine RWQCBs to ensure the protection of water quality through the regulation of waste discharges to land. Such discharges are regulated under Title 23, California Code of Regulations (CCR), Chapter 9, Division 3.

### ***STATE WATER RESOURCES CONTROL BOARD POLICY 75-58***

SWRCB Resolution 75-58, discourages the use of fresh inland water for power plant cooling and encourages the use of wastewater or other alternative non-potable water sources. This SWRCB policy prioritizes the source water of power plant cooling water: (1) wastewater discharge to the ocean, (2) ocean water, (3) brackish water from natural sources or irrigation return flow, (4) inland waste waters of low TDS, and, lastly, (5) other inland waters. This policy forms a basis for identifying water-use alternatives that tend to minimize adverse impacts.

Resolution 75-58 is supported by the California Water Code, Sections 461 and 13552, and by Water Commission Resolution 77-1, which encourages conservation of water resources and maximum reuse of wastewater, particularly in water-short areas.

### ***401 WATER QUALITY CERTIFICATION***

Section 401 of the Clean Water Act provides for state certification that federal permits allowing discharge of dredged or fill material into waters of the United States will not violate federal and state water quality standards. For the MVPC, any directional boring activities related to the natural gas pipeline that requires Federal permitting, will be subject to 401 certification by the Santa Ana RWQCB.

### ***GROUNDWATER MONITORING***

Under NPDES permitting, groundwater quality is monitored to determine if any adverse impacts are occurring to groundwater resources and reported to the RWQCB. Annual water quality testing includes specific conductance, total dissolved solids (TDS), total hardness, calcium, magnesium, chloride, potassium,

bicarbonate, boron, pH, sodium, nitrate, fluoride, and sulfate. Annual water production is also measured and reported to both the RWQCB and to the local San Bernardino Valley Municipal Water District (SBVMWD).

## **LOCAL**

### ***COUNTY OF SAN BERNARDINO***

#### **DEVELOPMENT CODE**

Chapter 10, Sections 87.1010 through 87.1070 of the County of San Bernardino Development Code specify grading requirements related to soil erosion control, slope ratio and height, and other conditions necessary to be in grading compliance. A grading permit is required for an excavation greater than two feet in depth or a fill one foot or more in thickness. A plan needs to be prepared by a civil engineer if grading is over 5,000 cubic yards. Grading activities associated with the MVPC facility and pipeline construction require that MVPC obtain this permit. The County Building and Safety Division under the Land Use Services Department is responsible for administering this permit (County of San Bernardino, 2000).

#### **FLOOD CONTROL PERMIT**

A Flood Control Permit would be required for a Utility Crossing and Storm Drain Construction (Personal Communication, M. Seals, San Bernardino County). The Utility Crossing is associated with the proposed 24 to 30-inch natural gas pipeline that will cross the Santa Ana River via direct drilling at Tippecanoe Avenue. The Storm Drain Construction section of the Flood Control Permit will permit the additional storm drains needed to accommodate additional runoff from the proposed site.

#### **WELLS**

The construction of groundwater wells is permitted through the San Bernardino County Department of Public Health, Environmental Health Services. County Ordinance 3105, Chapter 6, Article 3, describes the well permitting, construction standard and inspection requirements.

#### **WATERMASTER**

Groundwater use in the San Bernardino Basin Area is included in the terms of the adjudication of Santa Ana River Watershed. Under the judgement, the SBVMWD, as Watermaster, is responsible to maintain a safe yield of 167,238 acre-feet per year in the San Bernardino Basin Area. Although there are no specific allocations or limits on the increased pumping and no restrictions on the addition of new wells at the MVPC site under the adjudication, there are reporting requirements. MVPC is required to report the installation of the new wells and provide an annual notice of extraction to the Watermaster and the SWRCB.

## **CITY PERMITS FOR PIPELINE CONSTRUCTION**

The natural gas pipeline would be installed through the streets of the Cities of Redlands, Colton, Rialto, Fontana, Rancho Cucamonga, and San Bernardino. The water line connections would affect the Cities of Redlands and San Bernardino. There are no specific city requirements related to soils or water for pipeline construction; however, each city has LORS associated with construction activities within city streets. The LORS are related to traffic and transportation. Refer to the **Traffic and Transportation** Section for encroachment and/or excavation LORS related to pipeline construction.

## **ENVIRONMENTAL SETTING**

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### **SITE DESCRIPTION**

MVPC is proposing the construction of two new generating units at an existing power plant in San Bernardino County and increase its capacity by 1056 MW. The existing site on which the proposed facility would be located is in the San Bernardino Basin Area in the City of Redlands. The San Bernardino Basin Area is located between the San Andreas and San Jacinto faults in the southwest corner of the county. The San Bernardino Basin Area is a topographic valley that is bordered on the northwest by the San Gabriel Mountains, on the northeast by the San Bernardino Mountains, on the south by the badlands and Crafton Hills, and on the southwest by a low, east-facing escarpment of the San Jacinto fault. Mountainview Avenue is immediately west of the proposed MVPC facility. The south bank of the Santa Ana River is approximately 500 feet north of the proposed MVPC facility. Nearby major highways, include I-215 to the west and I-10 to the south. The existing plant occupies 16.3 acres at the northeast corner of San Bernardino Avenue and Mountain View Avenue.

According to the AFC, MVPC purchased the former San Bernardino Generating Station in 1998. Gross output of the existing generating units is 132 MWs. In 1987, the former owners, Southern California Edison, had placed the facility in short-term reserve and more recently the facility has only been used as a peaking facility (MVPC 2000a, p. 1-1). MVPC has purchased 38 additional acres adjacent to the existing plant from SCE (MVPC 2000a, § 6.15.1). Permanent power plant improvements would require approximately 18.7+/- acres and 3 acres for the laydown (staging) area (MVPC 2000k, Data Response #64).

New linear facilities include a 17-mile, 24-30-inch natural gas pipeline, which will connect the site from a Southern California Gas Line in Rancho Cucamonga. The pipeline would be laid in its entirety through city streets. A 14-inch secondary effluent wastewater (reclaimed) supply line would be extracted from the onsite wells (no linear calculations provided) or parallel an existing sewage line through the streets of the City of Redlands approximately 2.3 miles to the proposed cooling tower. A 12-inch, 1,100-foot wastewater discharge line will connect to the terminus of an existing water line, under the Twin Creek Channel to the easternmost terminus of the existing Santa Ana Regional Interceptor (SARI) line (MVPC 2000a §

2.11.1). Access roads to the facility will be provided off of Mountainview Avenue and San Bernardino Avenue. These roads will either be paved or covered with gravel.

Typical climatic patterns at the MVPC site are governed by a high-pressure system centered off of the coast of California. The summer features clear skies and warm temperatures averaging in the 90s°F, while the winter features wind and rain along with temperatures averaging around 40°F. The annual rainfall at the project area is approximately 18 inches and the 25-year storm event will produce approximately 8 inches of rainfall over a 24-hour duration. Most of the rainfall occurs between November and April (MVPC 2000a § 6.8.1.2, 6.14.1.7).

To date, the majority of the proposed site has been a gravel covered open area that has been part of the existing San Bernardino Generating Station. An additional 4.25 acres, which is currently used for agriculture, would be permanently taken out of production to accommodate the new facility.

## **SOILS**

The proposed MVPC facility site is relatively flat with a 0 to 2 percent slope. Existing drainage occurs from southeast to northwest. The existing elevation is 1,105 feet above mean sea level (msl). Final contour elevations have not been provided for the proposed facility.

The proposed power plant is to be located on Quaternary alluvial soils consisting of sands and silts with interspersed pebbles in the upper 100 feet (MVPC 2000a § 6.17.1.1). The soil mapping units affected by the proposed MVPC facility and respective pipeline corridors are identified in SOIL & WATER RESOURCES Table 1 according to slope percentage, permeability, and erosion hazard.

**SOIL & WATER RESOURCES Table 1**  
**Soil Descriptions and Properties**

Soil Series/Map Symbol	% Slope	Permeability	Erosion Hazard	Project Elements
Delhi Fine Sand (Db)	0-15	Excessive	Moderate to High	Natural Gas Pipeline
Grangeville Fine Sandy Loam (Gr)	0-2	Somewhat poor	Slight	MVPC Facility, Natural Gas Pipeline
Grangeville Fine Sandy Loam, Saline-Alkali (Gs)	0-2	Somewhat poor	Slight	Natural Gas Pipeline
Hanford Coarse Sandy Loam (HaC)	2-9	Well	Slight to moderate	Natural Gas Pipeline
Hanford Sandy Loam (HbA)	0-2	Well	Slight	MVPC Facility, Natural Gas Pipeline
Psamments (Ps) <sup>1</sup>	---	---	---	Natural Gas Pipeline
San Emigdio Fine Sandy Loam (ScC)	2-9	Well	Slight to moderate	Natural Gas Pipeline
Tujunga Loamy Sand (TuB)	0-5	Somewhat excessive	Slight to moderate	Water Supply Pipeline from City of Redlands, Natural Gas Pipeline
Tujunga Gravelly Loamy Sand (TvC)	0-5	Somewhat excessive	Slight	Wastewater Connector, Natural Gas Pipeline

Source: MVPC 2000a

Due to constant redeposition and reworking via the fluvial process, the properties of the Psamments soils are too varied to establish permanent properties.

## ***SURFACE WATER BODIES***

Surface water bodies in the vicinity of the proposed MVPC power plant include the Santa Ana River, approximately 500 feet to the north of the project and Mission Creek, half a mile to the south of the site (MVPC 2000a § 6.14.1.2). According to the August 14, 2000 Biological Resources Data Request and Response #130, the applicant has identified that earth disturbance associated with the natural gas pipeline will occur at the Santa Ana River and Etiwanda Creek.

The Santa Ana River, being an ephemeral watercourse, receives most of its flow during the winter-spring months and after thunderstorms in the mountain catchment area. Secondary flow contribution is attributed to urban runoff. The Santa Ana River originates at its headwaters in the San Bernardino Mountains and drains into the recently constructed Seven Oaks Dam. The watershed to the dam drains approximately 177 square miles. The dam was constructed by the ACOE for flood control in order to minimize peak flows and reduce the magnitude of floods downstream to the Prado Dam. The Seven Oaks Dam is located approximately 8 miles northeast of the City of Redlands. The Prado Dam is located southwest of the City of Norco in Riverside County. From the Seven Oaks Dam, the Santa Ana River flows through alternately natural and altered channels. The portion of the Santa Ana River in the vicinity of the proposed MVPC facility is approximately 1,800 feet wide with a channel invert slope of approximately 0.6 percent. The estimated

100-year discharges for the Santa Ana River in the vicinity of the proposed MVPC facility and the natural gas pipeline crossing are approximately 30,000 cubic-feet/second (cfs). Pre-dam conditions within the vicinity of the MVPC facility and natural gas pipeline would render a 100-year discharge of approximately 80,000 cfs (ACOE 2000).

The applicant has indicated that the proposed power plant site would be located outside of the 100-500-year flood boundaries (MVPC 2000a § 6.14.1.5). For more discussion on flooding and drainage, refer to the Geology and Paleontology chapter of this SA.

## **GROUNDWATER**

The proposed MVPC plant expansion is located in the Bunker Hill Groundwater Basin, the primary groundwater basin in San Bernardino Basin Area. Groundwater pumped from the basin is a major source of supply for the cities of San Bernardino, Loma Linda, and Redlands and the surrounding agricultural areas.

Groundwater use the Bunker Hill Groundwater Basin is included in the adjudication of the Santa Ana River Watershed. However, there is currently no shortage of groundwater owing to the importation of water from the State Water Project and artificial recharge projects in the basin. In fact, there is an excess of groundwater in some portions of the basin. In part, as a result of groundwater recharge programs, high groundwater levels have developed beneath the downstream portion of the Santa Ana River in the Bunker Hill Groundwater Basin, where marshland were historically located.

Under most circumstances, the maximum quantity of water that is available from a basin on a perennial basis is limited to the safe yield. Usually the limits of groundwater production is evaluated simply in terms of sustainable groundwater storage and the negative impacts caused by excessive pumping of the basin. However, owing to the high groundwater levels, the San Bernardino Basin Area currently produces more groundwater than the adjudicated safe yield of 167,238 acre-feet/year under a 1981 amendment to the adjudication agreement with Western Municipal Water District of Riverside County. Gross groundwater production in the San Bernardino Basin Area is currently about 190,000 acre-feet per year. Furthermore, the groundwater consumption proposed by MVPC is well within the basin's available supply owing to these specific hydraulic conditions and agreements in the basin (Reiter, 2000). The SBVMWD monitors the groundwater storage conditions in the basin and established 1993 groundwater levels and basin storage amounts as a benchmark with which to compare future basin storage volumes. The basin was considered "full" in 1993 (Reiter, 2000).

According to the applicant, the average change in basin storage for the years 1988-1998 was an increase of approximately 600 acre-feet per year. The AFC indicated that the amount of water required in 1999 to maintain the 1993 full basin storage level was 154,500 acre-feet; this amount was expected to be supplied from natural inflows and artificial groundwater recharge (MVPC, 2000a).

There are three water-bearing zones (aquifer zones) below the project site, each separated by confining clay (or aquitards) that are from 50 to 300 feet thick. Each aquifer zone is approximately 200 feet thick. Groundwater in the project area generally occurs initially at depths of approximately 100 feet below the surface. There are currently two onsite production wells at the power plant facility that produce water from the lower aquifer zone at a depth of 750 feet below ground surface. Since the installation of these wells the groundwater level in the wells has varied from 70 feet to 180 feet below ground surface.

SOILS & WATER RESOURCES Table 2 summarizes the general inorganic water quality of the lower aquifer zone for the two, existing onsite production wells.

**SOILS & WATER RESOURCES Table 2**  
**Ground Water Quality Analysis for Existing On-site Production Wells**

<b>Chemical Parameter</b>	<b>MVPC No. 1</b>	<b>MVPC No. 2</b>
Total Hardness (mg/l)	48	93
Total Dissolve Solids (mg/l)	180	170
Sodium (mg/l)	49	24
Sulfate (mg/l)	18	18
Chloride (mg/l)	5	5
Nitrate (mg/l)	6	8
Fluoride (mg/l)	1.3	0.8
Boron (mg/l)	ND	ND
Total Chromium (µg/L)	ND	ND
Copper (µg/L)	ND	ND
Lead (µg/L)	ND	ND

Source: MVPC 2000a. Table 6.14.1, Lower Aquifer Zone

Notes: Groundwater samples collected from on-site wells on 5/20/97

ND-Not detected

Definition of units: mg/l-milligrams per liter; µg/l-micrograms per liter

Groundwater contamination has made the management of groundwater resources in the Basin more complex, particularly because of the growing population. There are three contaminant plumes in the upper and middle aquifer in the vicinity of the power plant. For this reason, local water purveyors are concerned about the reliability of the water supply and the quality of groundwater. Since 1985, more than 40 public supply wells have been closed, at least temporarily, because concentration of a constituent in groundwater exceeded public health standards (NBS/Lowery, 1994). The water-quality constituents of concern include nitrate, organic solvents (TCE and PCE), perchlorate, and pesticides (DBCP), which have effected large portions of the groundwater system (MVPC 2000bb). If properly treated by filtration, dilution, and chemicals, this water would be suitable for most uses in power plant operations.

The movement of the contamination through the groundwater system is primarily controlled by the layered structure of the basin sediments and the location and depth of pumping within the basin. Therefore, understanding the structure and behavior of the regional groundwater system and the extent of groundwater contamination is critical to evaluating the availability of water supply for the project and the impact such use would have on existing groundwater conditions.

## **GROUNDWATER HYDROLOGY**

The basic structure of the Bunker Hill Groundwater Basin consists of up to 1,200 feet of valley-fill, underlain by igneous and metamorphic bedrock that extends to the basin boundaries and outcrops in the surrounding San Gabriel Mountains, the San Bernardino Mountains and the Crafton Hills (Hardt and Hutchinson, 1980). The valley-fill aquifer is composed primarily of highly transmissive unconsolidated and poorly consolidated deposits. The unconsolidated deposits of gravel, sand, silt, and clay constitute the primary reservoir for storing large quantities of water for the Basin. Near the base of the mountains, which are the source of the valley-fill sediments, the unconsolidated deposits tend to be coarse grained and poorly sorted. The region's creeks and the Santa Ana River have transported these deposits across the valley floor, reworking and redepositing them into increasingly well-sorted layers.

The deposits near the base of the mountains are poorly bedded, which allows recharge to move horizontally and vertically. Most of the groundwater recharge that occurs naturally percolates into the Basin through these deposits near the mountains. Beyond the margins of the Basin, the layering of gravel, sand, silt and clay become increasingly more distinct towards the center of the basin. In areas where sediments are well-sorted hydrogeologic units are well defined and strongly influence the flow-paths groundwater. Well-sorted clay layers separate the productive aquifer zones and retard the vertical flow of groundwater, while aquifer zones of well-sorted sand and gravel transmit water readily in the horizontal direction.

## **GROUNDWATER CONTAMINATION**

Sources of contamination, as well as recharge to the groundwater system, occur at the land surface and percolate downward into the shallow portions of the aquifer. In areas where the groundwater system is well layered, water and contamination tends to flow horizontally through the upper aquifer zone. However, contamination moves downward into the deeper aquifer zones wherever downward vertical gradients, caused by pumping, draws groundwater through the clay layers. The rate of transport of the contamination is controlled in large part by amount of pumping that occurs in the middle and lower aquifer zones and the thickness and permeability of the clay layers in the vicinity of the pumping.

Groundwater contamination in the Bunker Hill Groundwater Basin has become widespread, both areally and vertically, affecting large portions of both upper and middle aquifer zones. There are several TCE plumes that have been identified in the Bunker Hill Groundwater Basin (MVPC 2000bb). The primary plume that could be effected by the MVPC project is the Crafton-Redlands plume, which has contaminated approximately 150,000 acre-feet of groundwater with TCE (MVPC 2000bb). This plume also contains PCE, DBCP and perchlorate. MVPC is located on the leading edge of the plume, which originated about 4 miles east of project site.

## ***SITE Groundwater Hydrology***

In the vicinity of the project site, the valley-fill sediments have been deposited into layered system of aquifer zones, separated by aquitards, which act a confining layers that retard the vertical movement of groundwater.

**SOIL & WATER RESOURCES Table 3**  
**Characteristics of the Groundwater System beneath the MVPC Site**

Hydrostratigraphic Units (HSU)	Description	Depth Interval (depth from land surface, measured in feet)	Groundwater Contamination Detected
HSU 1	Upper aquitard	0 to150	No
HSU 2	Upper aquifer	150 to 225	Yes
HSU 3	Middle aquitard	225 to 400	Yes
HSU 4	Middle aquifer	400 to 570	Yes
HSU 5	Lower aquitard	570 to 775	No
HSU 6	Lower aquifer	775 to 1025+	No

Source: MVPC 2000h, Figure 6.14-2a, Mountainview Power Company Well #1

The description of hydrostratigraphic units (layers of groundwater system), provided by the applicant (MVPC 2000n), is consistent with the regional hydrostratigraphic units described in previous reports (Hardt, 1980 and MVPC 2000cc). The upper aquifer in the vicinity of the project site consists of sands, silts with minor gravel and clay, while the middle and lower aquifer zones consist primarily of sand and gravel. The aquitards are composed of silt and clay with minor sub-layers of sand and gravel.

## ***Site Groundwater Contamination***

Aquitards play an important role in slowing the vertical movement of groundwater contamination from the upper to the lower aquifer zones in the vicinity of the project site. MVPC is located about 1 mile from the eastern edge of the pressure zone of the Bunker Hill Groundwater Basin. The pressure zone is so named because the low-permeability clay in the aquitards has the capacity to confine water in the underlying aquifers under pressure. The pressure zone covers about 25 square miles in the lowest part of the basin where the Santa Ana River and the regional creeks coalesce. Prior to groundwater development, the basin's hydrodynamics created high water pressure conditions and upward gradients in the lower aquifers within the pressure zone. Although today groundwater pumping from the middle and lower aquifer zones has reduced water pressures in the lower aquifer zones, the aquitards do slow the vertical transport of contaminated groundwater within the pressure zone.

However, east of the project site, lateral inflow of contamination through the upper and middle aquifer zones is occurring. About a mile to the east of the project site at the edge of the pressure zone, the aquitards appear to thin out, which has allowed groundwater contamination to flow downward more easily in response to pumping withdrawals from the lower aquifers. Once contamination enters the middle portion of the groundwater system, contamination can move laterally through the aquifer.

### ***Municipal Water Supply Conditions***

There are several public water supply wells in the vicinity of the project site. The closest are 4 wells that have served the city of Loma Linda. These wells are within a half-mile of the existing MVPC site, where the proposed project-supply wells would be located. These public wells are screened in either the middle or lower or both aquifer zones and are located at the leading edge of the Crafton-Redlands plume. TCE and/or perchlorate have been detected in 3 of the wells, which have been subsequently taken off-line. Three new deep wells are being installed for the city, two of which will be located less than 2000 feet from the project site.

**SOIL & WATER RESOURCES Table 4**  
**Loma Linda Production Well Data**

<b>Well Name</b>	<b>State Well No.</b>	<b>Water-Bearing Unit (Aquifer Zone)</b>	<b>Distance from MVPC Well # 1 (feet)</b>	<b>Well Status</b>
Mountain View #1	1S4W24A	HSU 4,5	1,129	I, P, T
Mountain View #2	1S4W24B01S	HSU 5,6	1,610	I,P
Mountain View #3	n/a	HSU 6	1,129	New well
Mountain View #4	n/a	HSU 6	n/a	New well
Mountain View #5	n/a	HSU 6	1,610	New well
Richardson #1	1S4W23CO2	HSU 5,6	2,350	
Richardson #2	1S4W23CO2	HSU 4,5,6	2,175	I,P,T

Source: MVPC 2000II, Table 165B 'Regional Production Well Data'

Terms: n/a - information not available; HSU - hydrostratigraphic unit (see Table 3); I - Inactive or abandoned well; P - Perchlorate has been detected in the well; T - TCE has been detected in the well.

Groundwater contamination is necessitating the abandonment of public wells screened in the middle aquifer zone (HSU 4). New wells are being drilled in the lower aquifer zone that has not yet been contaminated within the Loma Linda's water service area. However, as pumping decreases in the middle aquifer zone and increases in the lower aquifer zone, downward groundwater gradients will occur, inducing the transport of contamination into the lower aquifer zone.

### ***CITY OF REDLANDS RECLAIMED WATER***

The City of Redlands has committed to providing at least 50 percent of MVPP's plant make-up water needs and may eventually supply as much as 80 percent from its wastewater treatment facility. The reclaimed water will be derived from a Rapid Infiltration/Extraction (RIX) process in which secondary treated wastewater is discharged to a percolation basin and then pumped from shallow extraction wells located just down gradient of the percolation ponds. The City of Redlands expects to complete final testing and receive final approvals for the system by December 2000. The existing piping has capacity to supply 50 percent of the MVPC make-up water needs without additional pressurization (MVPC 2000mm, Data Response

#71). For information on the expected water quality of the reclaimed water, please see SOIL & WATER RESOURCES Table 7 below.

## ENVIRONMENTAL IMPACTS

### PROJECT SPECIFIC

#### ***EROSION AND SEDIMENTATION***

Power Plant Construction and Operation. Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction of the proposed project. Activities that expose and disturb the soil leaves soil particles vulnerable to detachment by wind and water. San Bernardino, being a semi-arid environment, may encounter storms of short duration and high intensity. Such runoff events coupled with earth disturbance activities can potentially enhance onsite erosion eventually resulting in off-site erosion and sedimentation.

As illustrated in SOIL & WATER RESOURCES Table 1, soil sensitivity related to erosion by the proposed MVPC facility is low. Soils at the power plant site are slightly susceptible to water erosion. Upon removal of any vegetative or gravel cover and the commencement of earthmoving activities, all soils are highly susceptible to erosion. SOILS & WATER RESOURCES Table 5 exhibits land disturbance acreage directly affected by construction and operation of the proposed project.

**SOIL & WATER RESOURCES Table 5**  
**Estimated Land Disturbance**

<b>Project Component</b>	<b>Construction (acres)</b>	<b>Operation (acres)</b>
Generating Plant (includes 3 acre temporary construction laydown area)	21.7	18.7
T- Line	0	0
NG Pipeline	206.0**	0
Off-site Staging Area	3	
Wastewater Line	2.53**	0
Freshwater Supply Line	27.87**	
<b>Total</b>	<b>261.1</b>	<b>18.7</b>

Source: MVPP 2000k, Data Response #20; Data Response #64.

\* Assumes 100 foot right-of-way for pipeline estimates.

\*\* Nearly all of the pipeline routes are located in established roadways.

According to the draft SWPPP, initial earthmoving activities at the MVPC plant site are expected to affect 18.7 acres and an additional 3.0 acres for construction laydown (staging). It is not known at this time the extent of cut and fill operations required to maintain positive drainage into the stormwater facilities and achieve final grade. Some earth disturbance will be necessary for the 3-acre construction laydown (staging) area. Earth disturbance will consist of topsoil and aggregate material. The excavated material suitable for reuse will be stored as stockpiles for

future use. The applicant has not identified stockpile location(s) at this time. "Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain" (MVPC 2000k, Data Response #64). Slopes will not be greater than 2:1 and may be reinforced with geotextiles and nailings for fills and cuts, respectively in areas where seismic loading is of concern. The applicant has identified that compaction during backfilling activities would undergo field-testing to ensure proper density. The applicant has also identified that no revegetation activities are required for the construction area (MVPC 2000k).

Pipeline Construction and Operation. Temporary and permanent disturbances related to construction of linear facilities (pipelines) are expected to occur. Water will be delivered to the site via a 12 to 16-inch supply line from onsite wells and from secondary effluent at the City of Redlands Waste Water Treatment Plant (WWTP), which is 2.3-miles from the proposed MVPC facility. The water supply line from the City of Redlands WWTP will parallel an existing sewage line through the streets of Nevada Avenue and San Bernardino Avenue within the City. Temporary earth disturbance activities for construction of the water supply line from the Redlands WWTP would entail 27.87 acres (assuming a 100-foot right-of-way). This activity will traverse slopes ranging from 0 percent to 5 percent. The erosion hazard would be considered slight to moderate (MVPC 2000a § 1.1, Table 6.15-2).

Wastewater from cooling tower blowdown will be discharged to an existing 12-inch waterline whose terminus is at the San Bernardino Public Golf Course at a point near the eastern side of the Twin Creek Channel. The MVPC proposes to connect the terminus of the pipeline and extend the new pipeline 1,100 feet to the SARI line, which starts at the San Bernardino Municipal WWTP. The crossing at the Twin Creek Channel will be an aerial crossing; therefore, minimal to no stream disturbance are anticipated to occur as a result of the pipeline crossing (MVPC 2000a § 1.3). This activity will traverse slopes ranging from 0 percent to 9 percent, and temporarily disturb approximately 2.53 acres. The erosion hazard is considered slight for this area (MVPC 2000a § Table 6.15-2).

A 17-mile long natural gas pipeline of from 24 to 30 inches in diameter will be laid entirely within existing street right-of-ways throughout several cities from Etiwanda Street to San Bernardino Avenue. The pipeline will cross under Etiwanda Creek and the Santa Ana River via a trenching and direct boring process, respectively. The pipeline will traverse through all soil types listed in SOIL & WATER RESOURCES Table 1 of this SA. The erosion hazard will range from slight to high and the slopes will range from 0 percent to 15 percent.

Pipeline installation in the street right-of ways will be done via a trenching method. Particular care will need to be taken regarding the amount of open trench at any given time and the proximity of stormwater inlets. Provisions associated with pipeline construction within roadways are provided in the Mitigation below.

The boring process requires bore pits for the equipment to conduct horizontal drilling across the Santa Ana River. Soil stockpiles will need to be protected from wind and water erosion and kept out of the active channel. As discussed in the draft Stormwater Pollution Prevention Plan (SWPPP), the applicant proposes to

schedule all construction activities, to the extent possible, during the drier months (MVPC 2000kl). Additional provisions regarding direct boring are provided in the Mitigation discussed below.

Pipeline construction activities that will cross any watercourses require a Streambed Alteration Agreement from the California Department of Fish and Game. Refer to the **Biological Resources** Section of this document for more information regarding the aforementioned requirement.

Roads. Access roads will be provided off of Mountainview Avenue and San Bernardino Avenue. Access roads and roads encircling the power blocks will be paved. All other roads will be either asphalt and/or concrete paved or gravel surfaces (MVPC 2000a § 2.7.4).

Physical effects of wind and water may continue to erode unprotected surfaces during project operation. Impervious surfaces can cause increased runoff that may eventually lead to accelerated erosion in unprotected areas. MVPC has provided a draft Erosion Control and Stormwater Management Plan and SWPPP that identify potential temporary and permanent Best Management Practices. This plan and provisions for the final draft are discussed under the proposed mitigation presented below.

## ***STORMWATER DISCHARGE***

The applicant has stated that “zero discharge” is expected from the site during operation of the MVPC facility because all runoff will be directed into a sediment retention basin. The runoff would then be injected into the cooling loop, partially evaporated, then discharged to the SARI line, which flows to a treatment facility prior to discharge in the ocean, and would be regulated by a Direct Connection Permit (MVPC 2000kl, Data Response #64).

The site drainage will be designed to comply with all federal, state, and local LORS. Onsite drainage will be accomplished by gravity flow, collected in storm drains, and then discharged to the sediment-retention basin. The site will be graded to control stormwater runoff along with interceptor facilities to direct flows to the sediment-retention basin. The stormwater pipes will be designed to accommodate a 24-hour, 25-year runoff event. Before runoff enters the basin, it will enter an oil/water separator. The oil would be transferred to an offsite permitted facility (MVPC 2000a § 6.14.1.7; MVPC 2000k, Data Response #64). According to the SWPPP, the stormwater is eventually discharged into the Santa Ana River. The August 24, 2000 Supplemental Response to the First Set of Data Requests #64 indicates zero discharge has been achieved at the existing site and would be maintained with the proposed site during operational activities. Compliance with the conditions of the General Construction Activity Stormwater Permit will be required; however, according to a conversation with Michael Adackapara (2000) of the Santa Ana RWQCB, compliance with conditions of the Industrial Activity Stormwater Permit will not be required, if MVPC can prove that stormwater would not be discharged into any receiving watercourses during operation.

The applicant (MVPC 2000kl) has indicated in the draft SWPPP that the existing site drainage and the proposed site will drain to the existing retention area. Approximately 11+/- acres would be paved with asphalt. According to the draft SWPPP, the 25-year, 24-hour runoff event would produce 8 inches of rainfall. This amount of rainfall will produce a runoff volume of 333,000 cubic feet from the 11+/- acres. The sediment-retention basin has a storage volume of 360,000 cubic feet. Areas with potential for oil contamination will direct water into oil/water separators then direct the water portion to the cooling tower basin. "All other site storm drainage will discharge to the Santa Ana River" (MVPC 2000a § 2.7.6).

## **PLANT WATER REQUIREMENTS**

MVPC will require a maximum total water supply of approximately 7,500 acre-feet per year (4,556 gallons per minute) based on a 100 percent capacity factor. Actual usage for the project, based on an approximate 60 percent annual capacity factor, is projected to be 4,515 acre-feet per year. (MVPC 2000kl, Supplemental Data Response Attachment 65B). The estimated peak summertime water requirements at a 100 percent capacity factor is 5,244 gallons per minute (MVPC 2000a). Water uses include wet draft cooling tower makeup, gas turbine evaporative cooler makeup, steam cycle water makeup, utility uses, potable water, and miscellaneous uses.

SOILS & WATER RESOURCES Table 6 shows the estimated daily water requirements at average and peak summertime full load operation.

**SOILS & WATER RESOURCES Table 6**  
**Daily Water Requirements At Full Load Operation**

<b>Water Use</b>	<b>Average Requirements (1000 gallons)</b>	<b>Peak Requirements (1000 gallons)</b>
Circulating Water Makeup	6955.2	7551.4
Evaporative Cooler Makeup	0	360
Steam Cycle Makeup	99.4	99.4
Internally Recycled Water	59	59
<b>Total</b>	<b>7113.6</b>	<b>8069.8</b>

Source: MVPC 2000a. Tables 2.13-1 and 2.13-2

Average requirements are based on an ambient temperature of 82°F and 34 percent relative humidity without evaporative cooling or duct firing; Peak requirements are based on an ambient temperature of 102°F and 18 percent relative humidity with evaporative cooling and duct firing.

To minimize the consumption of water the plant will be designed to cascade water from the boiler blowdown, evaporative cooler blowdown, and reverse osmosis reject stream to the wastewater storage and then to the cooling tower basins. Additionally, the cooling towers will be treated with a side stream softener, which will allow the cycles of concentration to be as high as 25 times before being blowdown to the wastewater discharge line.

Circulating water will be used in the heat rejection cycle providing cooling water to the surface condenser, which condenses steam from the exhaust of the steam turbine. The cooling water will circulate through mechanical draft cooling towers, which will use motor driven fans to move air into contact with the flow of the cooling

water. The heat from the cooling water will be discharged into the atmosphere by evaporation. Fine mist of water droplets entrained in the warm air leaving the cooling tower will be limited by the use of drift eliminators which will control it to 0.0006 percent of the cooling water flow. Water is made up to the cooling water system from the wastewater storage tank or sump to replace that which is lost due to evaporation and blowdown.

Evaporative coolers are used on the inlets to the combustion turbines to improve the output of the units during periods of high ambient temperatures. Since the combustion turbines generate power using the expansion of hot gases through a power turbine they are sensitive to the mass flow of air through the machines. The air is less dense in high ambient temperatures and therefore the amount of power produced is reduced. By circulating water across media at the turbine air inlet the effect from evaporation reduces the inlet air temperature thereby increasing the air density and thus the output of the turbine. Water is made up to the evaporative coolers to replace that which is lost due to evaporation and blowdown.

The steam cycle will use demineralized water in the process to create steam in the heat recovery steam generator to drive the steam turbine. The steam will be produced at 1,899 pounds per square inch and 1,050°F. There will be make up required to the steam cycle to replace losses as well as water that is blown down to maintain purity. The makeup water must be treated by filtration, reverse osmosis, and a mixed bed demineralizer prior to being directed to the heat recovery steam generators.

## **WATER SUPPLY**

Initially, MVPC proposed to meet its water requirements with groundwater from 3 sources: (1) two existing on-site wells that are screened in the lower aquifer zone (HSU 6), (2) one new deep on-site well to be screen in the lower aquifer zone (HSU 6), and (3) Gage Canal Water Company wells 46-1 and 56-1. Well 46-1 is screened in the upper aquifer zone (HSU 2), and Well 56-1 is screened in the middle and lower aquifer zones (HSU 4 and HSU 6). MVPC also proposed the possibility of using reclaimed water from the City of Redlands Wastewater Treatment Facility. This initial plan was subsequently replaced by the modified plan described below.

In response to CEC staff concerns regarding the potential for transport of contamination from the upper and middle aquifers zones into the lower aquifer zone that could be induced by pumping from deep project wells, MVPC proposed a modified water supply plan. In the modified plan, MVPC proposes 3 sources to meet its water supply requirements consisting of (1) groundwater from two new on-site wells to be screened in the middle aquifer zone, (2) reclaimed water from the City of Redlands Wastewater Treatment Facility, and (3) groundwater from the existing on-site wells, limited to the current production rate of 750 acre-feet per year (MVPC 2000kl, Supplemental Data Response Attachment 65B).

With this plan, approximately 3,750 acre-feet per will be pumped from the middle aquifer zone and 3,750 acre-feet of reclaimed water will be purchase from the City of Redlands Wastewater Treatment Facility as part of the City of Redlands

Reclaimed/Non-Potable Water Project on an annual basis. Each of the two new wells would be sized to produce up to 50 percent of the total MVPC water requirement, with a combined capacity of 100 percent. These wells will be constructed to a depth of no more than 650 feet and will be screened to produce water from the middle aquifer zone. The wells will be spaced far enough apart to minimize the effect of drawdown in one production well on water levels in the other production well (MVPC 2000kl, Data Response #166).

Groundwater from the middle aquifer zone will be supplemented as needed by water from the lower aquifer zone to dilute TCE concentrations. MVPC will also filter water from the middle aquifer zone with charcoal filters such that the plant will be able to utilize this water with less dilution should reclaimed water supply be interrupted on occasion. Service and firewater needs will continue to be supplied from the existing deep on-site wells that draw water from lower aquifer zone. Groundwater from these deep wells would also provide a backup, service and domestic water needs. MVPC has agreed to limit the use of water from the deep wells to 750 acre-feet per year and use water from the middle aquifer zone for all additional needs (MVPC 2000mm, Data Response #71).

At this time, the reclaimed water project is not yet complete, but is expected to be operational by the time the MVPP is operating. MVPC and the City of Redlands plan to enter into an agreement to provide a supply of reclaimed water that complies with the State's standards for "disinfected tertiary recycled water" as defined by proposed 22 CCR section 60301.230. The City of Redlands plans to model its treatment facility based on RIX project in San Bernardino that uses percolating ponds and shallow extraction wells. Depending on the efficiency of this filtration process, the water may be subsequently treated by chlorine or other disinfection processes so that the water would meet the standards for "disinfected tertiary recycled water". The City of Redlands expects to complete final testing and receive final approvals for installation of its system by December 2000, with completion of construction expected by the middle of 2002. (MVPC expects to complete construction between February and May of 2003 (MVPC 2000a).

Reclaimed water will be delivered to the power plant via an existing 14-inch water supply line, which runs along the street directly adjacent to the power plant. The existing pipeline for the delivery of reclaimed water has a capacity to supply approximately 50 percent of MVPC water requirements. However, if this capacity can be increased, MVPC would meet up to 80 percent of its needs with reclaimed water. The reclaimed water to MVPC would be delivered to the cooling water storage tank. The water in the tank would then be treated with a biocide in order to minimize the growth of Legionella and other microorganisms. It is recommended that as a condition of approval, following the installation of the reclaim water project the applicant agree to evaluate the use of additional water supply from this source to meet the plant water supply requirements greater than 50 percent.

SOIL AND WATER Table 7 shows the quality of well water from the middle aquifer zone, as-received reclaimed water, treated reclaimed water and the blended cooling tower makeup. The data for the middle aquifer zone is based on a well in the vicinity of the plant site. Even though TCE was not detected in the ground

water in these tests, modeling simulations indicate that a TCE concentration of 6 to 7 µg/l (micrograms per liter) can be expected in the next three years because of plume migration (MVPC 2000II, Data Response #166).

## **POTENTIAL IMPACTS TO GROUNDWATER RESOURCES**

Staff analysis and identification of potential adverse impacts included the following issues:

- well interference
- degradation of groundwater quality
- depletion of groundwater resources

Each of the issues identified above posed potential for adverse impacts. The discussion in this section describes the analysis of the likely impacts of the proposed project's use of water to the environment and to the health and safety of the public. This analysis addresses the modified water supply plan that was developed in response to CEC staff concerns regarding the potential for transport of contamination into the lower aquifer zone (MVPC 2000mm, supplemental data response Attachment 65B).

### **Well Interference**

Well interference occurs when the groundwater drawdown that would be caused by proposed pumping causes substantial and unacceptable declines in groundwater levels in existing nearby wells. This problem is most likely to occur when project wells are placed too close to existing wells.

Power plants are water-intensive operations when water is used for cooling. Agriculture and municipal land uses typically consume about 3 to 5 acre-feet of water per acre per year (DWR, 1986) with required application rates of about 4 to 7 acre-foot per acre. (Residential water use, per acre, requires approximately the same amount of water as agriculture.) MVPC's expansion will occupy about 40 acres (MVPC 2000a), and will require about 7,500 acre-feet per year or 188 acre-feet of water per acre per year. This means that the MVPC will require 25 to 45 times more water per acre of land than most other land uses. Correspondingly, the drawdown caused by project pumping will also be much larger, relative to the size of the overlying project site, than the drawdown for wells serving other typical land uses. Therefore, well interference for the project wells should be estimated for the SA and measured when installed to determine the impact on existing nearby wells. If the impact to existing active wells exceeds the drawdown impact that would be caused by typical land and water use, significant adverse impacts would be likely.

There are two adverse impacts that could occur owing to well interference. (1) Declines in groundwater levels in effected wells would increase the pumping lift and would correspondingly increase energy costs. (2) Declines in groundwater levels in effected wells could require the lowering of well bowls to maintain efficient operation and to prevent equipment damage.

**SOILS & WATER RESOURCES Table 7**  
**Water Supply and Cooling Tower Makeup**

Parameter	Units	Well Water	As-Received Reclaimed Water	Treated Reclaimed Water	Blended Cooling Tower Makeup
PH	S.U.	7.8	7.3	6.5	--
Cond	Mmhos	490	1,164	1,200	--
TDS	mg/l	291	464	466	367
Ca	mg/l	59	40	40	37
Mg	mg/l	12	9	9	7
Na	mg/l	28	67	67	46
K	mg/l	2.3	5	5	2.5
Cl	mg/l	9.3	58	58	34
SO4	mg/l	36	55	69	51
F	mg/l	0	0	0	0
PO4	mg/l	0	3.3	0.5	0.25
Mn	mg/l	0	0.02	0.02	0.01
Si	mg/l	20	20	20	20
As	mg/l	0	0	0	0
Fe	mg/l	0	0	0	0
NH3N	mg/l	0	2	2	1
NO2/NO3	mg/l	8.5	20	20	10
CO2	mg/l	10	17	25.4	0
Ion Bal.	%Err	0	0	0	0
SDI	Index	Low	Off scale	Low	0
TSS	mg/l	0	25	0	0
BODS	mg/l	0	20	5	5
COD	mg/l	0	N/R	N/R	100
Cu	mg/l	0	0.02	0.02	0.01
Zn	mg/l	0	0.05	0.05	0.025
Ba	mg/l	0	0	0	0
Cd	mg/l	0	0	0	0
Cr	mg/l	0	0	0	0
Cyanide	mg/l	0	0	0	0
Pb	mg/l	0	0	0	0
Hg	mg/l	0	0	0	0
Phenols	mg/l	0	0.05	0.05	0.025
Selenium	mg/l	0	0	0	0
Silver	mg/l	0	0	0	0
Perchlorate	µg/l	63	0	0	0
TCE	µg/l	0	0	0	0

Source: MVPC 2000II, Data Response #167

Definition of units: mg/l-milligrams per liter; µg/l-micrograms per liter ; Mmhos-Conductivity; SU-Standard Units

Calculation of well interference is usually based on one of several standard equations, an estimate or calculation of aquifer parameters (transmissivity and storativity), a representative pumping rate, time period, and the location of the pumping well relative to the existing production wells. The typical calculation applies only to wells that are completed in the same aquifer zone as the proposed well and, correspondingly, would be most effected by the proposed well.

On-site aquifer tests will be required to determine the actual drawdown in the two wells. However, to provide a preliminary analysis of the probable magnitude of well interference to be expected, MVPC provided an analysis of well interference in response to Data Request 165 (MVPC 2000II). The analysis used the Cooper-Jacob approximation to the Theis nonequilibrium equation for a confined aquifer, assuming a time period of 365 days. The applicant's analysis considered a range of likely aquifer parameters reportedly based on available data for other wells in the Bunker Hill Basin that are completed in the middle aquifer and also the Lockheed Martin groundwater model. A list of data references were not provided, although the selected values appear reasonable as compared to the aquifer values calculated from aquifer tests in the existing MVPC wells and the values in the Lockheed Martin groundwater model (MVPC 2000cc). The applicant's analysis used a pumping rate approximately equal to 50 percent of the estimated peak summertime water requirements, operating at 100 percent capacity. The applicant calculated drawdown for 5 radial distances from the project well that would be located closest to the existing public supply wells.

MVPC provided the results of their analysis of well interference in the following table.

**SOIL & WATER RESOURCES Table 8a**  
**MVPC Predicted Drawdown for Middle Aquifer Well**

Aquifer storativity = 0.01

Drawdown in feet					
Distance from Well (feet)	500	1,000	2,000	3,500	5,000
Transmissivity (gpd/ft)					
80,000	39	33	28	24	21
100,000	32	27	23	20	18
120,000	27	23	20	17	15

**SOIL & WATER RESOURCES Table 8b**  
**MVPC Predicted Drawdown for Middle Aquifer Well**

Aquifer storativity = 0.0001

Drawdown in feet					
Distance from Well (feet)	500	1,000	2,000	3,500	5,000
Transmissivity (gpd/ft)					
80,000	56	51	46	41	39
100,000	46	41	37	34	32
120,000	39	35	32	29	27

Source: MVCP 2000II, Table 165 A, 50 percent of water supply at peak pumping rate = 2,661 gpm  
 gpm = gallons per minute  
 gpd/ft = gallons per day per foot

Although staff was not able to duplicate the exact results provided by MVPC in Tables 8a or 8b, the drawdown shown in Table 8b is within the range one would expect to be produced within this aquifer system. However, results shown in the first set of calculations (Table 8a) is questionable for drawdown impacts within the

pressure zone because the aquifer storativity value of 0.01 is unusually high for a confined aquifer. In confined aquifers, storativities range in value from 0.005 to 0.00005 (Freeze and Cherry, 1979). On the other hand, for impacts to wells to the southeast, beyond the pressure zone, a higher storativity would be appropriate.

Staff prepared a similar analysis of well interference (SOIL & WATER RESOURCES Table 9) using the same parameters provided MVPC, MVPC's second aquifer storativity value of 0.0001, but using a time period of only 3 months to represent the summertime peak period.

**SOIL & WATER RESOURCES Table 9**  
**Predicted Drawdown for Middle Aquifer Well**  
**Peak Pumping Rate**

Aquifer storativity = 0.0001

Drawdown in feet					
Distance from Well (feet)	500	1,000	2,000	3,500	5,000
Transmissivity (gpd/ft)					
80,000	43	38	33	28	26
100,000	35	31	27	23	21
120,000	30	26	23	20	18

Well Equation: Jacob Straight-Line Method

50 percent of water supply at peak pumping rate = 2,661 gpm

Time period = 3 months

The results of staff's analysis of drawdown for peak pumping for a 3-month period indicate drawdown that is significantly less - about 10 feet less - than the drawdown calculated by MVPP. In part, this result indicates that the groundwater system may take longer than 3 months for drawdown to stabilize.

Staff also performed a second analysis using two different assumptions than the MVPC analysis: (1) pumping rate of 2,278 gallon per minute, which represents the proposed annual pumping rate for 50 percent of the project's water supply at a 100 percent operation capacity and (2) a 30-year time period, the expected life of the project.

**SOIL & WATER RESOURCE Table 10**  
**Predicted Drawdown for Middle Aquifer Well: Annual Pumping Rate**

Aquifer storativity = 0.0001

Drawdown in feet					
Distance from Well (feet)	500	1,000	2,000	3,500	5,000
Transmissivity (gpd/ft)					
80,000	53	48	44	40	38
100,000	43	39	36	33	31
120,000	36	33	30	28	26

Well Equation: Jacob Straight-Line Method

50 percent of water supply at average annual pumping rate = 2,278 gpm

Time period = 30 years

The results of this second analysis of drawdown for average pumping for a 30-year period indicate drawdown that is essentially the same as the drawdown calculated by MVPP.

To evaluate the impact of the project pumping on nearby existing wells, it is important to recognize that all pumping causes drawdown and some degree of well interference. As discussed in the criteria for determining impact significance, typical land uses, such as agriculture and municipalities, also requires water. Based on average weather conditions in the San Bernardino area, the 40-acre project site would require approximately 280 acre-feet of water for the irrigation of turf or pasture. This estimated applied water rate is based on the average reference evapotranspiration for the region of 4.6 feet (Snyder, 1999) and an irrigation efficiency of 65 percent (Osterli, 1988).

$$(40 \text{ acres} \times 4.6 \text{ feet of water per year}) / 65 \text{ percent} = 183 \text{ acre-feet per year}$$

Using irrigated acreage of 40 acres, local average annual evapotranspiration for turf of 4.6 feet of water and irrigation efficiency of 65 percent, we calculate that local average irrigation requirement for turf are 183 acre-feet/year.

The following table shows the estimated the drawdown impacts of pumping if the project site were to be planted and irrigated for turf or pasture with groundwater.

**SOIL & WATER RESOURCE Table 11**  
**Predicted Drawdown for Middle Aquifer Well: Irrigation of 40-acres of Turf**  
 Aquifer storativity = 0.0001

Drawdown in feet					
Distance from Well (feet)	500	1,000	2,000	3,500	5,000
Transmissivity (gpd/ft)					
80,000	4.1	3.7	3.4	3.1	2.9
100,000	3.3	3.0	2.7	2.5	2.4
120,000	2.8	2.5	2.3	2.1	2.0

Well Equation: Jacob Straight-Line Method

Typical Land-Use Water Requirements = 283 acre-feet/year (175 gpm)

Time period = 30 years

Although this analysis clearly indicates that even if a much smaller amount of water was required for the site, well interference still occurs. However, significantly less drawdown would be caused by the production of groundwater for the water requirement for a typical land use of property the size of the project.

To evaluate the potential impact of well interference, MVPC provided a table that lists the distance of water supply wells from the proposed well location (MVPC 2000II, Figure 165A 'Predicted Pumping Influence from Production Well in the Middle Aquifer' and Table 165B 'Regional Production Well Data'). This table also lists well status and recent production record. The following table, based on this information provided by MVPC, lists all of the wells screened in the middle aquifer

that would be most likely to be impacted by well interference from the proposed wells (Table 12).

The wells in SOIL & WATER RESOURCES Table 12 are divided into 3 groups. The first group of wells is inactive. There would be no impact to inactive wells. The second group of wells has been effected by the TCE and/or perchlorate plumes, and one of these wells has not been in use. Based on the estimated drawdown analysis, the wells that are active in this group would be impacted by the project wells. However, the wells in the second group may become inactive because of groundwater contamination and, if so, would not be impacted by project pumping. The third group of wells is active and neither TCE nor perchlorate has been detected in the wells. It is likely that if this last group of 7 wells remain active, they would be adversely impacted by project pumping.

Although there are also other production well located in the vicinity of the proposed project wells, they are screened in either the lower and upper aquifer zones it is unlikely that project pumping will significantly effect water levels in these wells. The shallower and deeper wells will be buffered from the direct impact of drawdown from the project pumping by the aquitards that separate the three aquifer zones within the pressure zone of the groundwater basin.

#### Groundwater Quality

Water quality could be adversely impacted by project pumping if it induced the migration of the existing groundwater contaminant plumes into the public water supply. Contamination of the public water supply is a critical issue. Project pumping should not increase the potential or the rate of contamination of fresh, uncontaminated water supplies for the region in any way.

The modified water supply plan was specifically proposed to avoid the potential for transport of contamination into the lower aquifer zone that pumping from a deep well posed. Project pumping in the middle aquifer will tend to counter balance downward gradients that may occur if more wells are completed and pump from the lower aquifer zone. Although project pumping may increase the rate of flow of contaminated groundwater from the east, it will also tend to capture contaminated water that would have otherwise continued to flow to the west. Overall, project pumping should have a net positive effect on groundwater quality with in the wells' area of influence. There are no specific or cumulative adverse impacts to groundwater quality caused by the proposed pumping that have been identified in this assessment.

#### Groundwater Resources

MVPC is located in a hot, arid region where precipitation and surface water flows are limited. The aquifer system is the primary reservoir for storing large quantities of water for the Basin. Furthermore, MVPC's rights to groundwater use as the property owner of the overlying land could be limited by the terms of the regional adjudicated of the Santa Ana River Watershed. Within this context, it is important to evaluate whether the proposed project's water use will cause substantial depletion of groundwater resources.

Adjudication of a watershed or basin occurs in California in areas of overdraft and/or intense conflict over limited water supplies. In an adjudicated watershed, the criteria for determining if the proposed project water use would cause substantial depletion of groundwater resources are usually established by the terms of the adjudication. Groundwater rights are accorded to the overlying landowner for reasonable use, subject to local laws and restrictions, including adjudication.

According to the Santa Ana River Watershed adjudication, the SBVMWD Watermaster is responsible to maintain a safe yield in the San Bernardino Basin Area. According to Robert Reiter, SBVMWD Watermaster, the groundwater consumption proposed by MVPC is well within the basin's available supply and no pre-construction permits are required (verbal communication, October 3, 2000).

**SOIL & WATER RESOURCE Table 12**  
**Estimated Well Interference for Local Wells Screened in the Middle Aquifer (HSU 4)**

Agency	Well Name	Water Bearing Zone(Aquifer Zone)	Located in Pressure Zone	Approx. Distance To MVPC	Well Status	Annual Production (acre-feet)				Estimated Well Interference		
						1995	1996	1997	1998	Typical Water Use	MVPC Water Use	Difference
				(feet)								
Marigold Farms	Marigold Farms	HSU 3, 4	yes	2,869	I	n/a	n/a	n/a	n/a	No impact; well inactive.		
Marigold Farms	Barton	HSU 3, 4	yes	3,947	I	n/a	n/a	n/a	n/a	No impact; well inactive.		
City of Redlands	COR#34	HSU 3, 4, 5	yes	3,620	I	0	0	0	0	No impact; well inactive.		
City of Redlands	COR Mission	HSU 4	yes	4,458	I	0	0	0	0	No impact; well inactive.		
Victoria Farms	Victoria Farms #3	HSU 4	yes	685	I, P	95	0	0	0	No impact; well inactive.		
City of Loma Linda	Mountain View #1	HSU 4, 5	yes	1,129	I, P, T	734	752	581	1	No impact; well inactive.		
City of Loma Linda	Richardson #2	HSU 4, 5, 6	yes	2,175	I, P, T	1,330	1,475	1,435	887	No impact; well inactive.		
City of Riverside	Gage#92-1	HSU 4, 5, 6	yes		P, T	4,173	3,979	2,611	4,392	n/a	n/a	n/a
City of Riverside	Gage#51-1	HSU 4, 5	yes	6,263	P	323	1,121	1,168	2,196	2.3	30	27
City of Riverside	Gage#66-1	HSU 4, 5	yes	7,338	P	6,058	2,297	1,756	150	2.2	29	27
City of Riverside	Gage 6 New	HSU 4	yes	4,235	P, T	0	0	0	0	No impact; well not yet in use		
City of Riverside	Gage#56-1	HSU 4, 5, 6	yes	3,702		891	2,271	1,393	2,170	2.5	32	30
City of Redlands	COR Church St	HSU 4	no	21,899		0	0	428	1,267	0.8	11	10
Marigold Farms	Acquil	HSU 3, 4	yes	3,000		1,120	1,243	996	1,111	2.6	33	31
Loma Linda Univ.	LLUniv Anderson#2	HSU 4, 5, 6	yes	7,925		429	392	581	466	2.2	28	26
Loma Linda Univ.	LLUniv Anderson#3	HSU 4, 5, 6	yes	6,565		734	845	538	415	2.3	29	27
City of Riverside	Hunt#10	HSU 3, 4	no	12,291		374	382	343	180	1.1	14	13
City of Riverside	Hunt#11	HSU 4	no	12,251		368	14	195	36	1.1	14	13

SOURCE: Based on MVPC 2000II, Table 165B

Note: Regional production pumping information from SBVWCD annual engineering reports and MVPC data.

Well Status: (I) inactive or abandoned well; (P) perchlorate has been detected in the well; (T) TCE has been detected in the well.

Calculation of well interference based on Jacob Straight-Line Method, 30-year time period, aquifer storativity of 0.0001, aquifer transmissivity of 100,000.

## **WASTEWATER DISCHARGES**

Incorrect disposal of wastewater or inadvertent chemical spills can degrade soil, surface water and groundwater. MVPC plans to collect all plant wastewater streams in a tank or sump and recycle them to the cooling tower basin. Sanitary wastes will be directed to the existing septic system and leachfield. After 20 to 25 cycles of concentration with the use of a side stream softener, cooling tower blowdown will be discharged to the Santa Ana Regional Interceptor (SARI) for disposal. The SARI discharge line runs to the Orange County Sanitation District's Fountain Valley Wastewater facility where the wastewater is treated prior to discharge to the Pacific Ocean through a permitted outfall pipeline (MVPC 2000a § 2.11.3).

The Santa Ana Regional Interceptor Line was constructed by the Santa Ana Watershed Project Authority (SAWPA) and was completed in 1995. The SAWPA is a joint exercise of powers agency made up of Orange County Water District, Eastern Municipal Water District, Inland Empire Utilities Agency, Western Municipal Water District of Riverside County and SBVMWD. The SARI line is a permitted "brine" line that follows the Santa Ana River drainage through San Bernardino, Riverside, and Orange Counties and terminates at the Orange County Sanitation District's Fountain Valley Wastewater Treatment Plant. The total length of the pipeline is over 73 miles and has a capacity of between 15 and 30 million gallons per day.

MVPC will discharge an average of 200 gallon per minute and has contracted for a discharge capacity to the SARI pipeline of up to 288,000 gallons per day as well as treatment capacity at the Fountain Valley Wastewater Treatment Facility. In the AFC and Data Responses, the applicant indicated its intention to enter into agreements to discharge wastewater into the Santa Ana Regional Interceptor Line and to have those wastes treated at the Fountain Valley Wastewater Treatment Plant (MVPC 2000k, Data Response #70; 2000kl; 2000mm). It is recommended that as a condition of approval the applicant must verify that these agreements have been completed and that they contain provisions to handle the quantity of wastes identified in the SA.

Wastewater is generated in the plant in various systems prior to being discharged from the cooling tower basin. The plant systems that generate wastewater include the circulating water system, evaporative cooler blowdown, heat recovery steam generator blowdown, plant drains, storm water runoff, reverse osmosis reject water, and mixed bed demineralizer regeneration wastes.

Evaporative cooler blowdown will consist of waste that was circulated in the combustion turbine evaporative cooler system by approximately 10 cycles depending on water supply quality. It is then blowdown to maintain the level of dissolved solids within acceptable limits. Makeup water to the evaporative coolers will be treated by filtration and reverse osmosis. The evaporative cooler blowdown will be recycled to the wastewater storage facility and then to the cooling tower basins.

Makeup water to the heat recovery steam generators will be treated by filtration, reverse osmosis, and demineralization. Heat recovery steam generator blowdown will consist of water discharged to maintain control of the concentration of boiler water total dissolved solids. The heat recovery steam generator blowdown will be recycled to the wastewater storage facility and then to the cooling tower basin.

Plant drains and storm water runoff with potential for oil contamination (primarily around equipment and within containment berms) will be directed to an oil/water separator. The water portion of the separator is then directed to the cooling tower basin and the oil is recycled or trucked to a licensed hazardous waste facility. All other storm drainage will discharge directly to the Santa Ana River (MVPC 2000a § 2.7.6).

The reverse osmosis reject water contains the concentration of dissolved solids from the plant makeup water before it is treated in the ion exchange demineralizer as well as the multi-media filters upstream of the reverse osmosis system. The reject water consists of a concentration of the makeup water by approximately four times as well as residues of the chemicals used to eliminate free chlorine that would damage the reverse osmosis membranes. Filter backwash water will contain the suspended solids removed from the raw water and residues of the coagulant used to enhance filtration efficiency. These wastes streams will be recycled to the wastewater storage facilities and then to the cooling tower basin. The mixed bed demineralizer will be leased and therefore regenerated off-site by a supplier with permits to dispose of the waste products.

Makeup water to the circulating water system including the cooling towers will consist of secondary effluent reclaimed water from the City of Redlands, well water, and water from the onsite wastewater storage. The cooling tower will utilize a sidestream softening system, which cleans the circulating water to allow a greater number of concentration cycles (20 to 25 times) before requiring blowdown. Additionally, chemicals will be added to control scaling, biofouling and corrosion of the towers. The cooling tower blowdown will be discharged via an underground pipeline to the SARI brine line.

SOILS & WATER RESOURCES Tables 13 and 14 show the estimated wastewater volumes and cooling tower blowdown wastewater quality respectively.

To maintain operating efficiency the turbines will undergo a water wash periodically when they are off-line. Treated good quality water will be used for this purpose on an intermittent basis. The applicant has not identified the use for water washing for the combustion turbines. This may be performed either when the plant is on line or off line. Generally, the amount of water used is not significant when compared to the other water uses and it is not expected that it would change any of the conclusions of the SA, but it should be accounted for. It is recommended that as a condition of approval the applicant should identify if and how the turbine water wash is to be performed including frequency, water quality required, amount of water used per wash and annually, and any waste disposal required.

**SOIL & WATER RESOURCES TABLE 13**  
**Estimated Wastewater Volumes**

Waste Stream	Daily Average (gpm)	Daily Maximum (GPM)
Cooling Tower Blowdown	200	300
HRSB Blowdown	90	90
Evaporative Cooler Blowdown	30	50
Reverse Osmosis Reject	40	150
Misc. Drains to Wastewater Storage	11	11
GT offline water wash (gal/yr)	Unk	n/a

Source: MVPC 2000kl, Data Response #65

a. Average daily quantities are based on MVPC water balance at 82°F, 34% RH

Maximum daily quantities are base on MVPC water balance at 102°F, 18% RH

The wastewater discharge line will connect to an existing 12-inch water pipeline that runs west from the power plant site for approximately 2.8 miles. This pipeline was formerly a water supply line for the power plant connected to an out-of-use water well located within the San Bernardino Public Golf Course. A new 1,100-foot long 12-inch pipeline connector will run from the endpoint of the out-of-use water pipeline across the Twin Creek Channel to the existing SARI discharge line (MVPC 2000a § 2.11.3).

## **CUMULATIVE IMPACTS**

No other projects are proposed in the vicinity of the MVPP and, thus, the MVPP will not result in any cumulative environmental impacts from construction or operational activities. There are no specific or cumulative adverse impact to groundwater supply caused by the proposed pumping that have been identified in this assessment. Proper implementation of the proposed mitigation measures and adoption of the conditions of certification will ensure that the proposed MVPC Project does not cause cumulative impacts in the area of soils and water resources.

**SOIL & WATER RESOURCES Table 14**  
**Cooling Tower Blowdown Water Quality**

Parameter	Units	Cooling Tower Blowdown
PH	S.U.	8
Cond	Mmhos	12,000
TDS	mg/l	9,000
Ca	mg/l	300
Mg	mg/l	20
Na	mg/l	2,600
K	mg/l	75
Cl	mg/l	1,500
SO4	mg/l	4,200
F	mg/l	0
PO4	mg/l	1
Mn	mg/l	0.07
Si	mg/l	140
As	mg/l	0
Fe	mg/l	0
NH3N	mg/l	10
NO2/NO3	mg/l	200
CO2	mg/l	0
Ion Bal.	%Err	0
SDI	Index	Off scale
TSS	mg/l	25
BODS	mg/l	50
COD	mg/l	150
Cu	mg/l	0.07
Zn	mg/l	0.175
Ba	mg/l	1
Cd	mg/l	0.01
Cr	mg/l	0.05
Cyanide	mg/l	0.2
Pb	mg/l	0.05
Hg	mg/l	0.002
Phenols	mg/l	0.175
Selenium	mg/l	0
Silver	mg/l	0
Perchlorate	µg/l	0
TCE	µg/l	0

Source: MVPC 2000II, Data Response #167

## **FACILITY CLOSURE**

If the use of a project well(s) is to be discontinued permanently at any time during the life of the project or at closure of the facility, MVPC will be responsible to abandon the well(s) in accordance to state and local regulations for well abandonment. Currently well abandonment is regulated by the San Bernardino County Department of Public Health, Environmental Health Services, and procedures are specified in County Ordinance 3105, Chapter 6, Article 3.

A planned, unexpected temporary or permanent closure of the proposed MVPP should not be a significant concern if the site drainage and erosion are properly dealt with for any potential closure.

Unexpected permanent closure may pose the potential for drainage and erosion problems due to a lack of maintenance of the facilities. Staff will require MVPP to address this concern in their closure plan.

## COMPLIANCE WITH LORS

SOIL & WATER RESOURCES Table 15 lists the LORS to which the project must comply. Staff has determined that the project will comply with the LORS described in the SA with the adoption of the conditions of certification.

### SWRCB POLICY 75-58

SWRCB Policy 75-58 states that the source of power plant cooling water should come from the following sources in order of priority:

1. Wastewater being discharged to the ocean.
2. Ocean water.
3. Brackish water from natural sources or irrigation returns flow.
4. Inland wastewaters of low total dissolved solids.
5. Other inland waters.

The first two sources listed are not feasible options for the proposed project due to its distance from the coast; and irrigation return flows do not represent a reliable or sufficient water source in the project area. MVPC's water supply plan complies with the policy goals expressed in SWRCB Resolution 75-58 through the use of contaminated groundwater and reclaimed wastewater to satisfy the project's water cooling requirements.

**SOIL & WATER RESOURCES Table 15**  
**Summary of LORS Requirements**

Reporting Agency	LORS	Description	Details
Regional Water Quality Control Board and San Bernardino Municipal Water District	Clean Water Act	Groundwater quality monitoring	Specific conductance, TDS, total hardness, calcium, magnesium, chloride, potassium, bicarbonate, boron, pH, sodium, nitrate, fluoride, and sulfate
San Bernardino County Department of Public Health, Environmental Health Services	San Bernardino County Ordinance 3105	Well installation requirements	Permitting, construction standard and inspection procedures
San Bernardino Municipal Water	Terms of the Santa Ana River	Groundwater use notification	Installation of the new wells annual notice of extraction

District Watermaster and State Water Resources Control Board	Watershed judgement		
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## MITIGATION

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### APPLICANT'S PROPOSED MITIGATION

#### ***EROSION AND SEDIMENT CONTROL***

In response to a staff data request, MVPC provided a draft Stormwater Pollution Prevention Plan, along with a set of drawings that identify temporary and permanent erosion control and stormwater Best Management Practices (BMPs). When finalized, this plan will serve as part the Storm Water Pollution Prevention Plan (SWPPP) as required under the General Construction NPDES Permit issued by the State WRCB. The SWPPP can also be used to comply with any local LORS.

The draft SWPPP identified a number of potential BMPs for the construction and operation of the project:

- Temporary or permanent seeding strategies
- Preservation of existing vegetation around the site perimeter for erosion control
- Direct runoff away from disturbed areas to the sediment-retention basin by means of berms
- Scheduling construction between April and November to minimize working in wet weather
- Stabilize plant site roadways with compaction or gravel
- Utilize soil stabilizers (i.e. water) as appropriate to minimize dust
- The use of geotextiles and mats to stabilize disturbed areas and protect slopes and channels
- Storm drain inlet protection to prevent sediment-laden runoff from entering inlets or catch basins.
- Utilize silt fence, sandbag and straw bale barriers to intercept sediment-laden runoff from disturbed soil
- Storm water retention basins to retain runoff and allow excessive sediment to settle out
- Secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of liquid materials from contaminating soil or soaking into the ground

- Designated storage areas for construction wastes, hazardous materials, paints, and related products along with covered dumpsters and containers for waste and recyclables
- Training of employees on stormwater quality management
- Implementation of a spill prevention and control plan
- Timely removal of construction wastes
- Use of portable toilet facilities managed by licensed contractor
- Storage of all liquid wastes in covered containers

## ***SITE DRAINAGE***

The site drainage will be designed to comply with all federal, state, and local regulations. Onsite drainage will be accomplished by gravity flow, collected in storm drains, then discharged to the sediment-retention basin. The site would be graded to control stormwater runoff along with interceptor facilities to direct flows to the sediment-retention basin. The stormwater pipes would be designed to accommodate a 24-hour, 25-year runoff event. Before runoff enters the basin, it would enter an oil/water separator. The oil would be transferred to an offsite permitted facility (MVPC 2000a § 6.14.1.7; MVPC 2000k, 200kl, Data Response #64).

## ***SPILL PREVENTION***

A site spill contingency plan will need to be developed for chemical spill control and management of the hazardous materials that will be stored and used on the site (refer to the **Hazardous Materials Management** section of this SA for more information). As described in the draft SWPPP, MVPC hazardous materials would be surrounded by secondary containment structures, protected from precipitation by covers, and stored in drums approved by the Department of Transportation. These drums would be placed on spill containment skids and housed at a storage area located in a warehouse northwest of the process area. Sodium hypochlorite, which is used to treat biotic organisms and pH, would be stored in a 10,000 gallon, fiber reinforced aboveground storage tank within a diked area. Sodium hydroxide, used to control pH levels, would be stored in an 8,000-gallon lined metal aboveground tank contained within a diked area. Sulfuric acid, also used for pH control, would be stored in an 8,000-gallon lined metal aboveground tank contained within a diked area (MVPC 2000a § 6.10.3.2).

## ***GROUNDWATER PROTECTION***

MVPC has proposed to periodically check the well drawdown impacts on local wells both before and after plant operations begin. Should an impact occur, MVPC proposes to work with local deep well owners to solve the problem to the satisfaction of both parties which would include such actions as reduced water withdrawal flows, lowering or modification of existing pumps and replacement of impacted owner's equipment. (MVPC 2000h)

Staff supports the general concept proposed by MVPC's to evaluate and mitigate well interference impacts on local wells. However, the plan to mitigate these impacts needs to be more specific, systematic, and quantified. Staff has provided a proposal for mitigation of well interference in the section below to be discussed with the applicant in the upcoming Committee Workshops.

MVPC has also proposed to monitor 5 local production wells listed below:

1. Coll Mountain View #1
2. Victoria Farms #3
3. GCC Well #56-1
4. Coll Mountain View #3
5. Coll Mountain View #5

Groundwater levels would be monitored on a monthly basis for the first six months following the project start up and thereafter on a quarterly basis. (Purveyor staff may perform the actual measurements, although MVPC staff may receive permission to monitor these wells.) This information may also be useful in evaluating the impact of project pumping if the effect of project pumping can be clearly identified in the changes in water levels observe in these wells.

## **CEC STAFF PROPOSED MITIGATION**

Energy Commission staff finds MVPC, LLC's proposed mitigation measures for erosion and stormwater to be incomplete.

The drawings and narrative portion of the draft SWPPP need to be revised to include more detailed and specific information about the proposed measures. Staff recommends the following protocol be followed to amend and revise the SWPPP for the proposed facility and pipelines:

- The topographic features of the proposed project including areas involving all proposed pipeline construction, laydown (staging) area, and stockpile location(s). The mapping scale should be 1"= 100' or less (1"=50' recommended). Sufficient surrounding area including the topography and existing features should also be provided on the drawings.
- Soil mapping units along with their respective boundaries should be included on the E&S mapping. Soil use limitations associated with construction and revegetation need to be acknowledged and resolutions should be provided to assist the contractor in overcoming any limitation (refer to the soil survey for specific soils information).
- Proposed contours should be shown tying in with existing ones. All proposed utilities including stormwater facilities should be shown on the plan drawings. All erosion and sedimentation control facilities should be shown on the mapping. The drawings should contain a complete mapping symbols legend that identifies all existing and proposed features including the soil boundary and a limit of construction. The limit of construction boundary should include the project facility, pipeline areas, stockpile areas and laydown areas. The

limit of construction ensures all work is confined to the proposed MVPC project in order to protect all surrounding areas not involved in construction or operation of the proposed project.

- Maximum drainage areas to the sediment-retention basin should be delineated on the drawings. A USGS Quad map is acceptable to accommodate any off-site large drainage areas.
- A detailed and specific construction sequence is needed that addresses all sequence of events from initial mobilization until final stabilization (i.e. vegetation/asphalt) is achieved.
- Calculations should be provided for all proposed ditches and rip-rap energy dissipaters; the San Bernardino County Flood Control District has a Hydrology Manual that should provide guidelines regarding design of these facilities. The plan drawings should provide specific details and cross-sections of all proposed facilities. If the relocated diversion ditch is to be lined with vegetation, temporary erosion control matting is recommended. The type of matting should meet shear stress conditions. It is recommended to install straw bales at the end of the channel. This allows for unobstructed flow and traps sediment at the channel outfall. This method can be used until the appropriate lining has been installed and/or vegetation becomes established within the channel. The proposed diversion ditch re-route exhibits a sharp channel bend; therefore, provide appropriate measures to ensure channel capacity and stability within the bend.
- The proposed sediment-retention basin will need to be designed according to local ordinances or the SARWQCB provisions. The design calculations for the sediment-stormwater retention basin should account for stormwater and sediment storage for existing and proposed runoff. According to the SWPPP, site storm drainage will discharge to the Santa Ana River. The basin should include an outlet structure designed to allow for solids separation so that only clean water is discharged to the receiving watercourse. The drawings should also provide a stormwater discharge outlet along with its location. The discharge outlet should also have some form of outlet protection to prevent scour.
- Silt fence and sandbags should be installed on level grade and parallel to the existing contour. If the slope length to 18" or 30" silt fence exceeds 250 feet or 500 feet respectively, other erosion and sediment control facilities should be used. Silt fence and sandbags should be used to trap sediment, and not as runoff conveyance facilities. Earthen berms or channels can be substituted to intercept sediment-laden runoff and direct it into the sediment-retention basin.
- All site-specific BMPs should appear on the erosion and sediment control plan and the stormwater management plan. As discussed in the August 14, 2000 Supplemental Response #64, the retention basin will be adequate to handle the 100-year, 24-hour storm. The stormwater management plan should provide the entire drainage area along with supporting calculations that include a curve number; time of concentration; rainfall intensity; and stage storage within the basin. Calculations should be provided to demonstrate the amount of time it takes for the basin to dewater. All final plans approved for

adequacy are to be implemented by the contractor. The CPM should be contacted before any revisions are made to the approved plans.

- Pipeline excavation within roadways should be limited to an area that can be excavated and backfilled within a day. Exposed soil should be stabilized upon backfilling the open trench. Spoil material should not be located near any stormwater inlets and should be hauled offsite to an approved disposal area.
- All excavated material from the boring and trenching across waterways should be kept away from active flows and out of any wetlands. The soil should be covered via a liner or anchored mulch. Areas disturbed from the bore pits and machinery should be stabilized via permanent vegetation upon completion of the process. Proper storage and use measures for the drilling mud will be needed in the SWPPP so as not to cause any water quality impacts. Erosion and sediment (E&S) control measures need to be identified on the plan if machinery will be working in any stream channel during aerial installations.

## GROUNDWATER

Staff identified 3 potential impacts with respect to groundwater use, which includes well interference, water quality degradation and water supply depletion. Staff concluded that well interference would be likely to cause a moderate adverse impact to nearby water supply wells that screened in the same aquifer zone as the proposed project wells. Staff identified the following 11 wells that are likely to be impacted by the project if they remain in operation.

**SOIL AND WATER RESOURCE Table 16**  
**Local Water Supply Wells Likely to be Impacted by Project Pumping**

Agency	Well Name	Water-Bearing Zone (Aquifer Zone)	Approx. Distance to MVPC Site (feet)
City of Riverside	Gage#92-1	HSU 4, 5, 6	
City of Riverside	Gage#51-1	HSU 4, 5	6,263
City of Riverside	Gage#66-1	HSU 4, 5	7,338
City of Riverside	Gage 6 New	HSU 4	4,235
City of Riverside	Gage#56-1	HSU 4, 5, 6	3,702
City of Redlands	COR Church St	HSU 4	21,899
Marigold Farms	Acquil	HSU 3, 4	3,000
Loma Linda Univ.	LLUniv Anderson#2	HSU 4, 5, 6	7,925
Loma Linda Univ.	LLUniv Anderson#3	HSU 4, 5, 6	6,565
City of Riverside	Hunt#10	HSU 3, 4	12,291
City of Riverside	Hunt#11	HSU 4	12,251

Staff found that no significant adverse impact to water quality or water supply would be caused by the proposed project.

Adverse impacts caused by well interference are likely to occur but can be mitigated. Although the applicant has proposed to monitor local production wells, as described above, the evaluation of well drawdown impacts on local production wells

may not be feasible or practical. Problems occur because isolating and quantifying the well interference from an individual source within an active well field with many other groundwater users is often quite difficult. Additionally, it is often impossible to suspend production in local wells for period of time that is long enough to allow static water levels in the well to recover and to perform an adequate aquifer test that produces measurable drawdown in the local wells.

Alternatively, staff recommends that aquifer tests be performed on each of the new project wells. Each well would be tested separately, using the other new well, the currently existing MVPC wells and available local wells as observation wells. It will be important to perform well-designed aquifer tests of sufficient duration to produce stable, measurable drawdown in the observation wells. This is a standard method to verify drawdown calculations based on estimated aquifer parameters and to develop more accurate calculations of the long-term impacts of a project's pumping on nearby wells.

Mitigation would be based on the calculated drawdown impacts that are in excess of the drawdown that would occur with typical land use, as illustrated in Table 7. The magnitude of impact would be recalculated using the aquifer parameters determined by the field aquifer tests performed on the new project wells, the actual annual production rate of the project wells, the water-use analysis for turf that was presented under Project Specific Impacts for Well Interference. Mitigation costs for project well interference would be determined on an annual basis by (1) the increase in energy costs associated with the increase in lift caused by well interference and (2) the cost of well-bowl lowering caused by the lower water levels that would occur in active nearby wells screened within the middle aquifer zone (HSU 4).

Staff anticipates that payment of increased in energy costs associated with the increase in pumping lift and payment for the cost of well-bowl lowering would fully mitigate adverse impacts associated with well interference. The details of this mitigation need to be developed prior to certification to ensure all impacts are fully mitigated.

MVPC (2000b) has identified that nitrate, the organic solvents TCE and PCE, perchlorate, and the pesticide DBCP have effected large portions of the groundwater system (MVPC 2000bb). To ensure that the water quality used by the facility is within acceptable levels, staff is recommending the project owner monitoring the water quality for these and other important groundwater constituents.

## **CONCLUSIONS AND RECOMMENDATIONS**

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Staff has concluded that the proposed MVPP will not result in any significant adverse impacts to soil or water resources if all of the recommended conditions of certification are adopted by the Commission and implemented by the applicant. The one exception to this is the determination of how increased costs to owners of neighboring wells resulting from well interference will be compensated. These costs

will result in an increase in energy costs resulting from the increase in lift and the cost of well-bowl lowering.

Staff recommends the adoption of the Conditions of Certification (COC) to ensure the implementation of the project as described and compliance with LORS, mitigation agreements and monitoring plans.

## CONDITIONS OF CERTIFICATION

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**SOIL & WATER 1:** Prior to beginning any clearing, grading or excavation activities associated with project construction, the project owner will comply with the General Construction Activities Stormwater Permit. The project owner will develop and submit a Stormwater Pollution Prevention Plan (SWPPP) for MVPP and related facilities to the Energy Commission for review and approval. The components of the SWPPP need to include all existing and staff required BMPs listed in the Mitigation Measures. A Facility Closure Plan should be included to provide site stabilization measures in the event of an unexpected permanent closure.

**Verification:** Thirty days prior to the start of any clearing, grading, or excavation activities, the project owner/applicant will submit a copy of the revised Storm Water Pollution Prevention Plan (SWPPP) for MVPP and related facilities including a Facility Closure Plan to the Energy Commission Compliance Project Manager (CPM) for review and approval. No earth disturbance activities may commence until the SWPPP has been deemed adequate by the CPM. The owner/applicant has not identified all stream crossings for the natural gas pipeline and the approaches to be taken during construction activities. Staff assumes that the remaining crossings will be aerial in nature and that the installation approach will occur from within the stream. In the event that construction equipment will need to enter the stream, the owner applicant will need to comply with the mitigation measure associated with stream crossings.

**SOIL & WATER 2:** Prior to commercial operation, the project owner will present stormwater calculations and routing procedures to the Santa Ana RWQCB to verify if an NPDES permit for Industrial Stormwater would be required. The project owner will indicate to the Energy Commission whether the project will be required to comply with the General Industrial Activities Storm Water Permit. If the project must comply with the General Permit requirements, the project owner will develop and submit a revised Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission for review and approval.

**Verification:** Thirty days prior to commercial operation, the project owner will submit to the Energy Commission CPM in writing whether the project will have to comply with the provisions of the General Industrial Activity Storm Water Permit. If the project does have to comply the project owner will develop and submit a revised

Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission for review and approval prior to commercial operation.

**SOIL & WATER 3:** Prior to beginning any clearing, grading or excavation activities, the project owner/applicant shall submit and obtain approval from Energy Commission staff for an erosion and sediment (E&S) control plan for MVPP and related facilities.

**Verification:** The erosion control plan shall be submitted to the Energy Commission CPM for approval 30 days prior to the initiation of any clearing, grading or excavation activities. The final plan shall contain all of the elements of the draft plan and the final design of the project along with changes made to address staff comments provided in the Mitigation section of the SA and comments from other agencies received on the draft plan. The erosion control plan may be combined with the construction Storm Water Pollution Prevention Plan.

**SOIL & WATER 4:** Prior to any grading operations, the project owner will obtain a grading permit from the San Bernardino County Building and Safety Division under the Land Use Services Department.

**Verification:** Prior to any clearing or grading activity, the project owner/applicant will submit for approval, one set of plans/specifications and other supporting data specified within the Engineered Grading Requirements of the San Bernardino County Development Code to the CPM. Upon CPM approval, the project owner/applicant will submit an application and required plans to the San Bernardino County Building and Safety Division.

**SOIL & WATER 5:** Prior to any directional boring activities, the project owner/applicant will submit and obtain approval for a Frac-Out Contingency Plan (FCP). The plan needs to include specifications for pre-monitoring in order to determine if the proposed route will not cause any adverse impacts during the boring. The plan also needs to provide for remediation in case a frac-out occurs followed by potential boring mud contamination. An extensive monitoring program needs to be implemented during the boring operations. Other aspects of the plan need to address contacting all agencies that have jurisdiction within the Santa Ana River and informing them of the proposed boring operation. An agency contact list needs to be developed and kept onsite. The agencies should be contacted in the event of a frac-out.

**Verification:** Thirty days prior to the direct boring project, the owner/applicant needs to submit an FCP to the CPM for review. Construction activities may not commence until the plan has been deemed adequate by the CPM.

**SOIL & WATER 6:** Following the installation of the reclaim water project the owner/applicant needs to evaluate the availability of additional water supply from this source to meet the plant water supply requirements greater than 50 percent.

**Verification:** After the City of Redlands has completed the installation and testing of the secondary effluent water treatment plant the applicant shall evaluate the capability of this facility to determine feasibility of it providing greater than 50 percent of its water requirements as is the current plan. This analysis with specific recommendations shall be presented to the CPM for review.

**SOIL & WATER 7:** Prior to discharging wastewater from MVPP to the SARI pipeline and the Fountain Valley WWTP, the project owner shall obtain approval of a Direct Connection Permit from the Santa Ana Watershed Project Authority..

**Verification:** Thirty days prior to commercial operation, the project owner shall provide to the Energy Commission CPM with a valid Direct Connection Permit issued by the Santa Ana Watershed Project Authority and any other executed agreements for the discharge of wastewater from the MVPP to the SARI pipeline and Fountain Valley WWTP. The project owner shall inform the Energy Commission in writing of any subsequent changes to these permits within 30 days of the change. In addition, the project owner shall submit to the Energy Commission a copy of any annual monitoring reports required under these permits.

**SOIL & WATER 8:** The project owner shall meter and record all groundwater withdrawals from each well that supplies water to the project. Groundwater production from the existing on-site deep wells shall not exceed an annual total of 750 acre-feet all uses combined. Groundwater production from the proposed on-site middle-aquifer zone wells shall not exceed an annual total of 7,500 acre-feet.

**Verification:** The project owner shall submit an annual report listing the total amount of water withdrawn by each project well to the CEC CPM, the RWQCB, and the SBVMWD in writing each January 15.

**SOIL & WATER 9:** The project owner shall perform annual water quality testing to determine if any adverse impacts are occurring to groundwater resources. Testing shall include specific conductance, TDS, total hardness, calcium, magnesium, chloride, potassium, bicarbonate, boron, pH, sodium, nitrate, fluoride, and sulfate. Testing shall be conducted on all groundwater resources used for the project. The project owner shall prepare an annual report that describes the results of the testing. The report shall identify all sampling results, identify water quality trends and provide an explanation of cause and recommendations as appropriate.

**Verification:** Prior to the commencement of operation and annually thereafter, the project owner shall submit a copy of the groundwater monitoring report to the CEC CPM, the RWQCB, and the SBVMWD in writing each January 15. Testing shall include specific conductance, TDS, total hardness, calcium, magnesium, chloride, potassium, bicarbonate, boron, pH, sodium, nitrate, fluoride, sulfate and any other constituents as specified by the Energy Commission or the Santa Ana RWQCB.

**SOIL & WATER 10:** TCE, PCE, DBCP and perchlorate are monitored quarterly by the WSCP program. If the new project wells are not included in the WSCP monitoring program, the project owner shall perform quarterly water quality testing for TCE, PCE, DBCP and perchlorate on each of the new project wells.

**Verification:** Prior to the commencement of operation, the project owner will test TCE, PCE, DBCP and perchlorate to establish benchmark concentrations. The project owner shall submit a report on TCE, PCE, DBCP and perchlorate testing, including the WSCP report, to the CEC CPM on a quarterly basis thereafter.

**SOIL & WATER 11:** The project owner shall obtain well permits for the proposed project wells from the San Bernardino County Department of Public Health, Environmental Health Services.

**Verification:** The project owner shall submit a copy of the approved San Bernardino County well permits to the CEC CPM and provide notification of the new well installations to the SBVMWD 30 days prior to the startup of project operations.

**SOIL & WATER 12:** The project owner shall conduct aquifer tests in each new project wells to determine the site-specific aquifer parameters of transmissivity and storativity. Each well shall be tested separately, using the other new well, the currently existing MVPC wells and available local wells as observation wells. The test period shall long enough to produce stable, measurable drawdown in the observation wells.

**Verification:** The project owner shall submit a report describing the aquifer test to the CEC CPM and Santa Ana RWQCB 30 days prior to the startup of project operations. The report shall include a description of the results of the test, the test procedure, the raw data, and the calculation of aquifer parameters.

**SOIL & WATER 13:** The project owner shall recalculate the well interference impacts for active, local, middle-aquifer wells using the new aquifer parameter values developed from the aquifer testing of the new project wells, the estimated annual project pumping rates and the average annual water supply rates for a 40-acre parcel of irrigated turf.

The project owner shall reimburse impacted well owners for increased in energy costs associated with the increase in pumping lift and for the cost of well-bowl lowering. The details of this condition need to be developed prior to certification.

**Verification:** The project owner shall submit a report to the CEC CPM 30 days prior to the startup of project operations that describes the calculation of well interference, including a listing of all the parameters used, the calculation method and the location and distance of impacted wells relative to the project wells.

The details of verification of payment for well interference impacts need to be developed prior to certification to ensure all impacts are fully mitigated.

**SOIL & WATER 14:** The project owner shall monitor the 5 wells listed below:

1. Coll Mountain View #1
2. Victoria Farms #3
3. GCC Well #56-1
4. Coll Mountain View #3
5. Coll Mountain View #5

The project owner shall monitor groundwater levels on a monthly basis for the first six months following the project start up and thereafter on a quarterly basis. Purveyor staff may perform the actual measurements, although MVPC staff may receive permission to monitor these wells.

**Verification:** The project owner shall submit a quarterly report of the groundwater level monitoring to the CEC CPM on a quarterly basis.

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## Appendix A – MVPP Water Balance

## APPENDIX B – COOLING SYSTEM ALTERNATIVES

SWRCB Policy 75-58 states that “...studies associated with power plants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation.” Cooling towers reject heat from a power plant’s steam cycle to condense the steam exiting the steam turbine and to maintain the lowest possible condenser vacuum. The heat rejection mechanism in wet cooling towers is primarily the evaporation of water to the atmosphere. Dry cooling towers transfer heat convectively through heat exchangers, while wet/dry hybrid cooling towers use combinations of the two mechanisms to reject heat to the atmosphere. Cooling towers use forced or induced draft fans to move ambient air through the tower. The ambient air temperature, humidity, velocity, and mass flow rate affect the heat transfer rate and, ultimately, the efficiency of the cooling tower. The cooling tower heat rejection efficiency and pump and fan loading affect the overall power plant thermal efficiency and output.

The fundamental differences between wet, wet/dry hybrid, and dry cooling towers are initial capital costs and heat rejection effectiveness. Dry cooling towers are two to three times more expensive than a wet system. Hybrid systems fall in the range between the two, depending upon the ratio of “wet to dry” cooling in the hybrid design. In general, the cost differences are due to the dry condenser, or heat exchanger, and taller and larger structures for dry and hybrid cooling systems. Despite the significant cost differences, dry and hybrid cooling systems are occasionally employed because they use less water and reduce the occurrence of visible plumes compared to wet systems. For the Sutter Power Project (97-AFC-2), a combined cycle project, the switch from conventional wet cooling towers to dry cooling represented a 95 percent reduction in project water demand. For wet/dry hybrid systems, the reduction in water use is dependent upon the percentage of dry versus wet. Dry and hybrid cooling systems are, however, less efficient in rejecting heat, and generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser. Both of these factors decrease the thermal efficiency and power output of the project. The effects are not as significant on a combined cycle project as compared to a steam-cycle only project, in that the cooling system only affects the steam side of the combined cycle project and not the performance of the gas turbine. The effect would be greater at higher ambient temperatures because the relationship is non-linear. Additional fuel can be burned to overcome some or all of the loss of output, but the fuel will be an additional operating cost and will produce additional air pollutant emissions. Other characteristics include, for example, higher noise impacts for dry or hybrid cooling systems relative to a wet system due to larger fans to move more ambient air through the tower.

As part of the evaluation of MVPP, the applicant evaluated the capital costs, cooling tower makeup rate and cost, auxiliary power consumption and cost, and the net plant output and heat rate for wet, wet/dry, and dry cooling tower options. SOILS & WATER RESOURCES Table 17 shows the results of this evaluation.

**SOILS & WATER RESOURCES Table 17**  
**Cooling Tower Option Analysis**

	<b>WET</b>	<b>WET/DRY</b>	<b>DRY</b>
Estimated Capital Cost (\$million)	\$38	\$51	\$58
Avg. Cooling Tower Makeup Rate (gpm)	4,517	2,207	0
Aux Power Consumption (MW)	28	32	35
STG Gross Output (MW) per unit	212	199	199
Avg. Net Plant Output (MW) 2 units	1,060	1,021	1,021
Fuel Consumption. (mmBtu/h)	6,511	6,501	6,501
Net Power Differential (MW)	Base	(40)	(39)
Annual Incremental Makeup Cost (\$)	Base	-\$100,000	-\$200,000
Annual Incremental Fuel Costs (\$)	Base	-\$200,000	-\$200,000
Annual Incremental Chemical Costs (\$)	Base	-500,000	-\$900,000
Incr Annual Loss of Electrical Revenues (\$millions)	Base	\$7.3	\$7.2

Source: MVPC 2000t

When compared to the wet cooling towers the alternatives of using a dry or wet/dry cooling system would save on average 4,517 and 2,207 gpm respectively. However, there would be a corresponding estimated capital cost increase of \$20 million for the dry alternative and \$13 million for the wet/dry hybrid alternative. Additionally, there would be an estimated annual electric revenue decrease of \$7.2 million using the dry cooling alternative and \$7.3 million using the wet/dry alternative. Plant performance also suffers by a decrease in capacity of 39 MW and increase in fuel consumption of 10 mmBtu/h for the dry alternative and 40 MW and 10 mmBtu/h for the wet/dry alternative.

The estimated incremental annualized cost including capital recovery, fuel, makeup water, chemicals, and lost electricity generation are approximately \$7.8 million higher for both the dry and wet/dry hybrid alternatives.

Environmental impacts of the alternate cooling methods were also considered for particulate emissions, visible plume, land use, and noise levels. SOILS & WATER RESOURCES Table 18 shows the qualitative environmental comparison of the cooling tower alternatives.

**SOIL & WATER RESOURCES TABLE 18**  
**Qualitative Comparison of Cooling Tower Environmental Characteristics**

<b>Environmental Impact</b>	<b>Wet Cooling</b>	<b>Wet/Dry Cooling</b>	<b>Dry Cooling</b>
<b>WATER SUPPLY</b>	Highest supply and treatment requirements	Intermediate supply and treatment requirements	None
<b>Water Discharge</b>	Highest discharge and treatment requirements	Intermediate discharge and treatment requirements	None
<b>Plant Efficiency/Fuel Supply</b>	Baseline	Lower plant efficiency or higher fuel demand	Lower plant efficiency or higher fuel demand
<b>Plant Emissions</b>	Baseline	Can be higher if additional fuel used	Can be higher if additional fuel used
<b>Auxiliary Power Requirements</b>	Some	Greater than wet	Greatest compared to wet and wet/dry
<b>Secondary Emissions</b>	Salt deposition from Cooling Tower drift	Less salt deposition from cooling tower drift	No secondary emissions
<b>Land Requirements</b>	Baseline	Greater than wet	Greater than wet and wet/dry
<b>Visual Impact -Structural</b>	Least obtrusive	Taller structure compared to wet	Taller structure compared to wet and wet/dry
<b>Visual Impact -Plume</b>	Visible plume, function of ambient temperatures	Plume occurrence can be reduced	No plume
<b>Noise</b>	Lowest	Can be higher than wet	Can be higher than wet and wet/dry

Land use analysis indicate that for the three cooling alternatives the wet cooling tower would require an area of 54 ft x 384 ft and have a maximum height of 41 feet, the wet/dry cooling tower would require an area of 172 ft x 213 ft with a maximum height of 95 ft and the dry alternative would require an area of 300 ft x 360 ft with a maximum height of 106 ft. Noise levels for the three alternatives are all 85 dBA for near field @ 3 feet and 62 dBA @ 400 feet for the wet/dry cooling tower and 65 dBA @ 400 feet for the dry alternative. It is recommended that as a condition of approval the applicant must provide the far field (at 400 ft. from source) noise level for the wet cooling tower alternative. This information was provided for the dry and wet/dry hybrid alternatives and a comparison to the wet alternative is required.

A comparison of dry, hybrid, and wet cooling towers ultimately depends on the specific needs of the proposed application. Dry and hybrid-cooling systems provide benefits in the areas of water use and plume visibility, but with some performance degradation and additional costs. Additionally, dry and hybrid cooling can be noisier, use additional fuel, or be a more visually obtrusive structure.

Use of dry cooling or wet/dry cooling technology is technologically feasible and would reduce water demand but would have significant additional capital and operation and maintenance costs. A wet/dry cooling system would still require a significant water supply at least a portion of the year and would therefore include the additional economic and environmental costs of such a supply. None of the environmental impacts from any of the cooling tower alternatives are considered to be significant.



# **GEOLOGY AND PALEONTOLOGY**

Robert Anderson

## **INTRODUCTION**

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The geology and paleontology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of this analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of ten conditions of certification.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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The applicable LORS are listed in the AFC, in Sections 6.14, 6.16, 6.17, and 7.0 (MVPC 2000a). A brief description of the LORS for surface water hydrology, paleontological resources, and geological hazards and resources follows:

### **FEDERAL**

There are no federal LORS for geological hazards and resources, paleontological resources, or grading for the proposed project.

### **STATE AND LOCAL**

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33). The CBC supplements the UBC's grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

## **SETTING**

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The project is located in the San Bernardino valley basin within the eastern portion of the Transverse Ranges physiographic province. The Santa Ana River channel is located approximately 1,200 feet north of the northern limits of the existing powerplant grounds. No active faults are known to cross the power plant location. The proposed natural gas supply line crosses the Loma Linda and the San Jacinto faults approximately 3.2 and 4.4 miles northwest of the power plant site respectively. The San Jacinto fault is an active fault. The Loma Linda fault is considered to be associated with the San Jacinto fault zone and may also be active, but does not have a surface rupture trace in the vicinity of the natural gas pipeline. The proposed natural gas supply line also crosses the Santa Ana River channel approximately one mile west of the power plant. Site geology consists of alluvium and localized river channel and flood plain deposits made up of locally loose to dense silty sands, silts and clays with subrounded to subangular gravels. The site geological units are locally overlain by soils which vary from a fine sandy loam to a gravelly loamy sand (MVPC 2000a, figures 6.15-1a through 1c). Soils encountered at the power plant location include the Hanford sandy loam and the Grangeville fine sandy loam. Both the project site and the linear corridors have been extensively disturbed.

The project site lies at an elevation of approximately 1,105 feet above mean sea level. The depth to groundwater at the power plant is approximately 105 feet below existing grade (MVPC 2000a, Appendix E, page 6). Existing grade at the power plant site is less than 5%. The existing site drainage is sheet flow in nature and drains locally to the north.

## **ANALYSIS AND IMPACTS**

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### **GEOLOGICAL HAZARDS**

#### ***FAULTING AND SEISMICITY***

The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. Energy Commission staff reviewed the California Division of Mines and Geology publications "Geologic Map San Bernardino Sheet," dated 1978 (CDMG 1978) and the "Fault Activity Map of

California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions,” dated 1994 (CDMG 1994). Energy Commission staff visited the project site on July 27, 2000, and did not observe any surface faulting at the project site on the ground. No active faults are known to cross the power plant footprint.

The nearest major active fault expressing a surface rupture trace near the site is the San Jacinto fault. The San Jacinto fault is located approximately 4.4 miles northwest of the existing power plant. The Loma Linda fault is located 3.2 miles northwest of the existing power plant, but is not known to exhibit a surface rupture trace at the proposed natural gas pipeline crossing. The next closest major fault is the San Andreas fault, which is located approximately 5 miles north of the power plant site. The peak horizontal ground acceleration estimated for the site is 0.82g and is based upon a moment magnitude 7.4 earthquake occurring along the San Andreas fault.

### ***LIQUEFACTION, HYDROCOMPACTION, SUBSIDENCE, AND EXPANSIVE SOILS***

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. Three of the parameters used to assess the potential for liquefaction are the density, depth to groundwater, and the peak horizontal ground acceleration estimated for the site. The historic high ground water elevation at the existing power plant site is approximately 1,075 feet above mean sea level (30 feet below existing grade). In order to mitigate the potential for liquefaction in the power plant area, the depth to ground water has been artificially lowered by pumping and is at a depth of approximately 105 feet beneath the existing site. The lowering of the ground water in the vicinity of the project is a part of a ground water mitigation scheme in place called the High Groundwater Mitigation Project (HGMP). Because the alluvium under the site is unconsolidated, and the depth to ground water is in excess of 100 feet below existing grade, so long as pumping continues, and the estimated peak horizontal ground acceleration at the site is high (approximately 0.8g), the potential for liquefaction at the power plant site is considered to be moderate. It should be noted that liquefaction mitigation schemes in addition to the HGMP are available should a detailed liquefaction analysis for the project point to the need for a liquefaction mitigation plan. It is recommended by Energy Commission staff that the Applicant conduct a detailed liquefaction analysis of the project site and linear facilities prior to the completion of the final design for the power plant expansion. This is the subject of the proposed Condition of Certification **GEO-2** below.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are dense and not considered to be prone to hydrocompaction.

The applicant is proposing to pump groundwater from wells to be installed at or near the proposed power plant. The project site alluvium and soils are locally dense. Staff has therefore determined that there is no significant potential for subsidence due to groundwater withdrawal. The potential for ground subsidence due to dynamic compaction at the proposed power plant footprint is considered to be minimal due to the density of the near surface soils.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. The soil units at the proposed power plant site are the Hanford sandy loam and the Grangeville fine sandy loam. Both soil units are considered to have a low shrink-swell potential. The potential for expansive soil at the site is considered to be negligible.

## **LANDSLIDES**

No landslides were observed on or adjacent to the proposed power plant footprint during a staff site visit on July 27, 2000. Landsliding potential at the proposed power plant site is considered to be low, since the proposed power plant is located on a broad, gently sloping alluvial plain.

## **GEOLOGICAL AND PALEONTOLOGICAL RESOURCES**

There are no known geological or paleontological resources at the proposed power plant location or along the proposed linear facility alignments.

Regarding paleontological resources, Energy Commission staff has reviewed the paleontological resources assessments (MVPC/PEA 2000a). Geology at the power plant footprint and the transmission line location is made up of late Pleistocene to Holocene age alluvium. The location where the power plant will be expanded onto has been highly disturbed and locally paved over. On March 9, 2000, a paleontological resource survey was conducted for the proposed project. Prior to conducting the survey, an archive search and literature review was conducted. No significant paleontological resources were reported found by the applicant's paleontologist during field surveys of the proposed power plant site and linear facilities and during the archive and literature reviews. No paleontological resources were observed by Energy Commission staff at the power plant site during a site visit on July 27, 2000. Energy Commission staff has proposed conditions of certification, below, that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project.

## **SURFACE WATER HYDROLOGY**

The power plant footprint is not located in a 100-year flood zone as it is located in zone "AE," an area with a determined base flood elevation, which in this case is 1,081 feet above mean sea level. The existing power plant elevation is approximately 1,105 feet above mean sea level. This indicates that the site should not be inundated by off-site flooding associated with the 100-year flood. Minimum grade for the power plant area will be 1 per cent and all drainage will be directed away from buildings within the footprint. The 25-year 24-hour storm event precipitation amount is 8 inches (NOAA 1973). The proposed surface water drainage system is anticipated to be able to accommodate the surface water run-off from the project site.

## SITE SPECIFIC IMPACTS

Energy Commission staff consider that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related linear facilities. However, excavations, drilling, clearing and brushing operations, and grading of the alluvium at the power plant site and related linear facilities associated with construction of the project are considered to be a minor potential impact to paleontological resources, if the applicant complies with the proposed conditions of certification for paleontological resources. The adoption and implementation of the proposed conditions of certification for paleontological resources should mitigate any potential impacts to paleontological resources associated with the construction of this project.

## CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely, if the MVPP is constructed according to the proposed conditions of certification. This opinion is based on the fact that the site is not known to have significant paleontological or geological resources.

## FACILITY CLOSURE

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A definition and general approach to closure is presented in the **General Conditions** section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

## MITIGATION

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Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the waste water pipelines. The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project are complied with.

## CONCLUSION AND RECOMMENDATIONS

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The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources

and surface water hydrology. Staff proposes to ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology with the adoption of the proposed conditions of certification listed below, and the conditions of certification for surface water hydrology located in the **Soil and Water Resources** section of this document.

## PROPOSED CONDITIONS OF CERTIFICATION

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**GEO-1** Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the Compliance Project Manager (CPM). The functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

**GEO-2** Prior to the completion of the final design of the project, the owner shall have a liquefaction analysis conducted for the power plant site and related linear facilities. The liquefaction analysis shall be implemented by following the recommended procedures contained in "Recommended Procedures for Implementation of California Division of Mines and Geology Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California" dated March 1999. (The document is available through the Southern California Earthquake Center at the University of Southern California.)

**Verification:** The project owner shall include in the application for a grading permit (see Condition of Certification **GEO-3**, below) a report of the liquefaction analysis, and a summary of how the results of this analysis were incorporated into the project grading plan, for the CBO's review and comment.

**GEO-3** The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO, and to the CPM on request.

**PAL-1** Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

**Protocol:** The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

**Verification:** At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

**PAL-2** Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and

Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

**Protocol:** In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the owner is also to adopt and implement the United States Bureau of Land Management's General Procedural Guidance Manual for Paleontological Resource Management for those portions of the project deemed by the BLM to be under their jurisdiction. The owner shall develop a Paleontological Resources Monitoring and Mitigation Plan that shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

**Verification:** At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Paleontological Resources Monitoring and Mitigation Plan prepared by the designated

paleontological resource specialist for review and approval. The Paleontological Resources Monitoring and Mitigation Plan shall include a copy of the BLM paleontological resources use permit for the project. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

**PAL-3** Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

**Verification:** At least (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

**PAL-4** The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in

certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

**Verification:** The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

**PAL-5** The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

**Verification:** The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

**PAL-6** The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

**Protocol:** The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

**Verification:** The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

**PAL-7** The project owner shall include in the facility closure plan a description regarding facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the

facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

## REFERENCES

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CDMG (California Division of Mines and Geology). 1978. (Third Printing) Geologic Map of California San Bernardino Sheet, Scale 1:250,000.

CDMG (California Division of Mines and Geology). 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale: 1:750,000.

MVPC (Mountainview Power Company, LLC.) 2000a. Application for Certification Mountainview Power Plant Volumes 1 and 2, Submitted to the California Energy Commission February 1, 2000.

MVPC/PEA (Mountainview Power Company, LLC./Paleo Environmental Associates, Inc.). 2000a. Paleontological Resources Assessment Mountain View Power Project Mountain View Power Company, LLC. San Bernardino County, California, Submitted to the California Energy Commission on May 1, 2000.

NOAA (National Oceanic and Atmospheric Administration). 1973. Precipitation-Frequency Atlas of the Western United States, Volume XI-California, Figure 43.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.

# **FACILITY DESIGN**

Steve Baker, Al McCuen and Kisabuli

## **INTRODUCTION**

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Facility Design encompasses the civil, structural, mechanical and electrical engineering aspects of the project. The purpose of the Facility Design analysis is to verify that the laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project have been identified; and that the project and ancillary facilities have been described in sufficient detail, including design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

This analysis also examines whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety, environmental protection or the operational reliability of the project. This analysis further identifies the design review and construction inspection process and establishes conditions of certification that will be used to ensure compliance with the intent of the LORS and any special design requirements.

## **FINDINGS REQUIRED**

The Warren Alquist Act requires the commission to “prepare a written Decision ...which includes...(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state and federal standards, ordinances, or laws...”(Pub. Resources Code, §25523).

## **SUBJECTS DISCUSSED**

Subjects covered in this analysis include:

Identification of the LORS applicable to facility design;

Evaluation of the applicant’s proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;

Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS;

Identification of the Energy Commission’s design review and construction inspection process, which is used to ensure compliance with applicable LORS and protection of the environment and public health and safety; and

Conditions of certification proposed by staff to ensure that the project will be designed and constructed to comply with all applicable LORS, and protect environmental quality and assure public health and safety.

## SETTING

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Mountainview Power Company, LLC (Mountainview Power or the applicant) proposes to construct and operate the Mountainview Power Plant Project (MVPP). The MVPP will be a nominal 1056-megawatt (MW), natural gas-fired combined cycle power plant. The project will consist of two power blocks, with each power block consisting of two gas turbines and one steam turbine.

The applicant intends to locate the project on a 16.3-acre site at the northeast corner of San Bernardino Avenue and Mountain View Avenue in Section 18, Township 1 South, Range 3 West, in an unincorporated section of San Bernardino County. The main power facilities for the project will occupy about 16.3 acres and contain the Power Island, administrative buildings, chemical storage areas, cooling towers and other support facilities. For more information on the site and related project description, please see the **Project Description** section.

The site is in seismic zone 4, the highest seismic shaking zone in the country. Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendix D (MVPP 2000a).

The project is estimated to have a capital cost of approximately \$550 million. The applicant plans to complete construction and start operation of the combined-cycle unit in 2003. During construction, up to approximately 568 construction jobs will be created over the 19-month construction schedule. A permanent professional workforce of approximately 33 people will operate the plant.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

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The applicable LORS for each engineering discipline, civil, structural, mechanical and electrical, are included in the application as part of the engineering appendices, Appendix D and summarized in Section 7, Applicable LORS for construction and design (MVPP 2000a). A summary of these LORS includes: Title 24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

## ANALYSIS

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The basis of this analysis is the applicant's proposed analysis methods, construction methods and list of LORS and design criteria set forth in the AFC. Applicable engineering sections include:

Section 1.4	Project Schedule
Section 1.5	Project Ownership
Section 2	Project Description
Section 4	Facility Closure
Section 7	Applicable Laws, Ordinances, Regulations and Standards (LORS)
Appendices	
Appendix D	Engineering Design Criteria
Appendix E	Geologic Assessment

## **SITE PREPARATION AND DEVELOPMENT**

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Section 7 for a list of the applicable industry standards), design practices, and construction methods in preparing and developing the site. The applicant's proposed methods follow industry standard practices. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes conditions of certification included below to ensure compliance.

## **MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT**

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, or that require a long lead time to repair or replace, or those used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment are listed in the conditions of certification (**GEN-2** below).

The AFC contains a list of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and which staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

## ***PROPOSED MODIFICATIONS***

The AFC (MVPP 2000a, Section 7, and Appendix D) identifies LORS applicable to the project. The project should be designed and constructed to the 1998 edition of the CBC, and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the design of MVPP is submitted to the Chief Building Official (CBO)<sup>1</sup> for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

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<sup>1</sup>The CBO is the CEC's duly appointed representative, who may be the City or County Chief Building Official, or other appointed representative.

## ***CBC LATERAL FORCE REQUIREMENTS***

The procedures and limitations for the seismic design of structures by the 1998 CBC are determined considering seismic zoning, site characteristics, occupancy, structural configuration, structural system and height. Different design and analysis procedures are recognized in the 1998 CBC for determining seismic effects on structures. The dynamic lateral force procedure of Section 1631 is always acceptable for design. The static lateral force procedure of Section 1630 is allowed under certain conditions of regularity, occupancy and height as determined under Section 1629. Nonbuilding structures (such as cooling towers, tanks and heat recovery steam generators) are included in Section 1634. Most of the structures in powerplant projects are considered nonbuilding structures.

### ***STATIC LATERAL FORCE PROCEDURE***

In seismic Zones 3 and 4, the static lateral force procedure of Section 1630 may be used for the following:

Regular structures under 240 feet in height with lateral force resistance provided by systems, listed in Table 16-N, except where Section 1629.8.4, Item 4, applies. (Structures, regular or irregular, located on Soil Profile Type  $S_F$ , that have a period of vibration greater than 0.7 second require dynamic analysis.)

Irregular structures not more than five stories or 65 feet in height.

### ***DYNAMIC LATERAL FORCE PROCEDURE***

In seismic zones 3 and 4, the dynamic lateral force procedure of Section 1631 shall be used for all other structures, including the following:

Structures having a stiffness, weight or geometric vertical irregularity of Type 1, 2 or 3, as defined in Table 16-L, or structures having irregular features not described in Table 16-L or 16-M, except as permitted by Section 1630.4.2. (Where a combination of structural systems is included in the same structure, the structure can be analyzed as two independent structures for purposes of determining regularity.)

Structures over five stories or 65 feet, not having the same structural system throughout their height except as permitted by Section 1631.2. (An elastic design response spectrum constructed in accordance with Figure 16-3 of the 1998 CBC, using the values of  $C_a$  and  $C_v$  consistent with the specific site can be used.)

Structures, regular or irregular, located on Soil Profile Type  $S_F$ , that have a period greater than 0.7 seconds.

### ***RIGID STRUCTURES LATERAL FORCE DESIGN***

Rigid structures (those with a fundamental period of vibration less than 0.06 second) and their anchorage shall be designed using procedures consistent with

the requirements of Section 1634.3 and any other applicable provisions of Section 1634.

### ***TANKS WITH SUPPORTED BOTTOMS***

Flat bottom tanks or other tanks with supported bottoms founded at or below grade shall be designed consistent with Section 1634.4 and any other applicable provisions of Section 1634.

### ***OTHER NONBUILDING STRUCTURES***

Nonbuilding structures not covered by Sections 1634.3 and 1634.4 shall be designed consistent with the requirements of Section 1634.5 and any other applicable provisions of Section 1634.

### ***ENSURING THE APPROPRIATE LATERAL FORCE PROCEDURE***

In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** below, which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

## **CIVIL/STRUCTURAL FEATURES**

The applicant proposes, and staff concurs that small, lightly loaded structures, not subject to vibratory loading be supported on shallow footings or mat foundations on properly compacted fill or undisturbed native soils. Foundation depth should extend to at least 12 inches below lowest adjacent grade. If any portion of the foundation bears on bedrock, the entire foundation should be deepened to bear on bedrock. Large, heavily loaded structures, and structures subjected to vibratory loading, should be constructed on deepened foundations that bear on bedrock. Such foundations may include deepened footing or concrete reinforced pier and grade beams. The powerplant and related facilities shall be designed to meet the seismic requirements of the latest edition of the California Building Code.

## **MECHANICAL SYSTEMS**

The major features of the 1,056 MW power plant are the two power trains, each with two 167 MW natural gas fired, F-class combustion turbine generators (CTG), operating in combined cycle mode. Two pairs of CTGs will be installed in a two-on-one configuration with one 209 MW steam turbine generator (STG).

The heat from hot exhaust gas, which flows from each CTG through a heat recovery steam generator (HRSG), will be extracted to produce steam to power the STG. The MVPP will use 24 cooling tower cells arranged in two tower banks. The cooling towers are expected to be standard, induced draft counter-flow type. The 64-foot towers will incorporate plume abatement coils and high efficiency drift eliminators.

Other features of the project include: water and wastewater treatment facilities; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating,

ventilation, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems.

## ***MECHANICAL LORS AND DESIGN CRITERIA***

The application (MVPP 2000a, Appendix D) lists and describes the mechanical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's mechanical systems are designed to the appropriate codes and standards. Staff has proposed conditions of certification (**MECH-1** through **MECH-4**, below) to monitor compliance with this requirement.

## **ELECTRICAL SYSTEMS**

Major electrical features of the project other than transmission include generators, power control wiring, protective relaying, grounding system, cathodic protection system and site lighting (MVPP 2000a, Appendix D).

Power and Control Wiring. In general, conductors will be insulated based on a normal maximum conductor temperature of 90°C in 40°C ambient air with a maximum emergency overload temperature of 130°C and a short circuit temperature of 250°C. In areas with higher ambient temperatures, larger conductors will be used or higher temperature rated insulation will be selected.

Protective Relaying. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 4.16 kV systems, turbine-generator system, and the electrical loads powered from these systems. The protective relaying scheme will be designed to remove or alarm any of the abnormal occurrences.

Classification of Hazardous Areas. Areas where flammable and combustible liquids, gases, and dusts are handled and stored will be classified for determining the minimum criteria for design and installation of electrical equipment to minimize the possibility of ignition. The criteria for determining the appropriate classification are specified in Article 500 of the National Electrical Code's National Fire Protection Association/American National Standards Institute (NFPA/ANSI), Section C1.

Grounding. The station grounding system will be an interconnected network of bare copper conductors and copper clad ground rods. The system will be provided to protect plant personnel and equipment from hazard, which can occur during power system faults and lightning strikes. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentrations.

Site Lighting. The site lighting system will provide personnel with illumination for the performance of general yard tasks, safety, and plant security. Power used to supply outdoor roadway and area lighting will be 277 volts.

Freeze Protection. A freeze protection system will be provided for selected outdoor piping as required. Parallel circuit type heating cable will be utilized where possible.

Cathodic Protection System. Cathodic protection and other corrosion control measures for all plant structures, including the exterior surface of underground piping and bottoms of surface mounted steel tanks will be provided as required.

The AFC (MVPP 2000a, Appendix D) lists and describes the electrical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's electrical systems are designed to the appropriate codes and standards.

Staff concludes that the applicant can design the electrical systems in accordance with all LORS and in a manner which protects the environment and public health and safety by complying with the applicable LORS and electrical design criteria (MVPP 2000a, Appendix D). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

## **ANCILLARY FACILITIES**

- New connections to the existing adjacent SCE-owned 230 kilovolt (kV) switchyard will be added as part of the proposed project. No new transmission lines will be built.
- Natural gas will be supplied to the project via a new pipeline approximately 17 miles long. The 17-mile pipeline will connect to a Southern California Gas (SoCalGas) facility in the city of Rialto. The 24- to 30-inch pipeline will be laid entirely within the existing right-of-way of city streets.
- Water requirements for the project are 4,665 gallons per minute at full operation and will be supplied from a combination of sources. A minimum of 50% of requirements will be supplied using secondary effluent from the City of Redlands Waste Water Treatment Plant (WWTP).
- The other water supply sources for the plant will be onsite groundwater derived from two existing wells located on the property site and by two new wells to be drilled on site.
- Approximately 2.3 miles of new reclaimed water supply pipeline will be installed for transport of the secondary effluent.
- Wastewater discharge will be sent through an existing 12-inch water pipeline and a proposed 1,000-foot connector to the Santa Ana Regional Interceptor (SARI) discharge line.

## COMPLIANCE MONITORING

### ***THE ENERGY COMMISSION'S DESIGN REVIEW AND CONSTRUCTION INSPECTION PROCESS***

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions. The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design conditions of certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegate agents typically include the local building official and independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff has completed, or will complete, the following to ensure the design review and construction inspection process is consistent with the applicant's timing of the project:

1. Staff will meet with the local building department to discuss the Energy Commission's compliance process and the potential involvement of the local building official as delegate agent.
2. Staff will propose a memorandum of understanding (MOU) with San Bernardino County and the City of Redlands outlining the roles and responsibilities of the County and its subcontractors as delegate agents appointed by the Energy Commission to ensure compliance with the CBC and facility design conditions of certification.
3. Staff will meet with the City or County and its subcontractor (if applicable) to discuss the details of the design review and construction inspection process, fees, types of submittals required of the process and timing of the review.

Staff has developed conditions of certification (see the section below, titled "Proposed Conditions of Certification") to ensure compliance with LORS and protection of the environment and public health and safety. Some of these conditions address the roles, responsibilities and qualifications of MVPP's engineers responsible for the design and construction of the project (proposed conditions of certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be

registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility with construction activities, these conditions are written to require that no element of construction of permanent facilities, which is difficult to reverse, may proceed without prior approval of plans from the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall have the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

## **FACILITY CLOSURE**

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A facility closure was evaluated under three scenarios; Planned Closure, Unexpected Temporary Closure and Unexpected Permanent Closure.

### ***PLANNED CLOSURE***

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities. Future conditions that may affect the decommissioning Decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission and San Bernardino County and the City of Redlands for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

1. Proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
2. All applicable LORS, local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
3. The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
4. Decommissioning alternatives, other than complete site restoration.

### ***UNEXPECTED TEMPORARY CLOSURE***

Under this scenario, it is expected that the facility is closed unexpectedly, on a short-term basis. Natural disasters, such as an earthquake or severe storm, can

cause an unexpected temporary closure of the facility. If damage to the facilities is too great, the temporary closure may become permanent.

If the facility is closed on a temporary basis, the applicant shall secure the site in order to protect public health and safety. If temporary closure becomes permanent, the applicant shall follow the "Planned Closure" procedures outlined in the Planned Closure.

### ***UNEXPECTED PERMANENT CLOSURE***

Under this scenario, the project owner closes the facility unexpectedly on a permanent basis. In this case, the project owner shall implement the closure procedures outlined above for "Planned Closure."

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed a Condition of Certification (**GEN-9**) to ensure that these measures are included in the Facility Closure Plan.

## **RESPONSE TO PUBLIC AND AGENCY COMMENTS**

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Currently there are no public or agency comments.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

1. The laws, ordinances, regulations, and standards (LORS), identified in the AFC and supporting documents, are those applicable to the project.
2. Staff has evaluated the AFC, and the project LORS and design criteria in the record. Staff concludes that the design, construction and eventual closure of the project are likely to comply with applicable LORS. If properly implemented, design criteria, including staff proposed modifications, will ensure that LORS are met during the project design and construction phases.
3. The conditions of certification proposed will ensure that the proposed facilities are designed, constructed, operated, and eventually closed in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the local CBO or other commission delegate agent. Staff will audit the CBO to ensure satisfactory performance.
4. The Energy Commission design review and construction inspection process will be in place for the project and will allow construction to start as scheduled if the project is certified. The process will provide the necessary reviews to ensure compliance with applicable facility design LORS and conditions of certification.
5. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan required by **GEN-9**, prior to the commencement of

decommissioning, that the decommissioning procedure is likely to result in satisfactory decommissioning performance.

## RECOMMENDATIONS

If the Energy Commission certifies the project, staff recommends that:

- The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to comply with applicable LORS, and also to protect environmental quality, and assure public health and safety;
- The project should be designed and built to the 1998 CBC (or successor standard, if such is in effect); and
- The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and staff audit and monitor the CBO to ensure satisfactory performance.

## CONDITIONS OF CERTIFICATION

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**GEN-1** The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC)<sup>2</sup> and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: In the event that the MVPP is submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. *Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern.* Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

**Verification:** Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a

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<sup>2</sup> The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

**GEN-2** The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description of, and a list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment in **Table 1: Major Equipment List** below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

**Table 1: Major Equipment List**

Equipment/System	Quantity Plant	Size/ Capacity*	Remarks
Combustion Turbine (CT) Generator	4	167 MW each	Dry Low NO <sub>x</sub> combustion control
Steam Turbine (ST)	2	209 MW	Single shaft HPT, IPT and LPT (2x1 configuration and 1x1 configuration)
Generators	6		Included with CT and ST
CT Inlet Air Filter	4	3,600,000 lb/hr	
Inlet Air Cooling	4		Evaporative/Refrigeration/Fogging
Fuel Gas Filter – Separator	4	150,000 lb/hr	
Turbo expander	1	230,000 lb/hr	
Heat Recovery Steam Generator (HRSG)	4	550,000 lb/hr	HP, IP, LP with reheat
HRSG Stack	4		18'-0" dia.x213' high
Ammonia Injection Skid	4		Two blowers per HRSG-alternate
Aqueous Ammonia Storage Tank	1	20,000 gal	Double walled tanks – alternate, for NO <sub>x</sub> control
HP/IP HRSG feedwater pumps	4	1,700 gpm	HP with interstage bleed
Make-up Water Clarifier	1	5,6000 gpm	Gravity flow
Make-up Water Storage Tank	1	2,300,000 gal	Includes firewater storage
Demineralized Water Pumps	4	170 gpm	
Demineralized Water Treatment Package	1	350 gpm	
Demineralized Water Storage Tank	1	150,000 gal	
Condensate Pumps	6	1300 gpm	1 spare per condenser
Circulating Water Pumps	6	60,000 gpm/ 30,000 gpm	2x1 Configuration/1x1 Configuration
Wet Cooling Tower Banks	4	1.100mm BTU/hr / 600 mm BTU/hr	2x1 Configuration/1x1 Configuration
Fire Water Pump Skid	1	3,000 gpm	
Auxiliary Cooling Water Pumps	4	750 gpm	
Plant Air Compressors & Dryers	2	750 cfm	
Step-up Transformers	4	18/20 kV	To electrical grid

**\*All capacities and sizes are approximate and may change during project final design.**

**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 rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

**GEN-3** The project owner shall make payments to the CBO for design review, plan check and construction inspection, equivalent to the fees listed in the 1998 CBC, Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees. If San Bernardino County or the City of Redlands has adjusted the CBC fees for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.

**Verification:** The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

**GEN-4** Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

- Monitor construction progress to ensure compliance with LORS;
- Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
- Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;

- Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;
- Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
- Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**GEN-5** Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of powerplant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, powerplant structures, equipment support). No segment of

the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. [1998 CBC, Section 104.2, Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

- Review all the engineering geology reports, and prepare final soils grading report;
- Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
- Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;
- Recommend field changes to the civil engineer and RE;
- Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and

- Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [1998 CBC, section 104.2.4, Stop orders.]

C: The design engineer shall:

- Be directly responsible for the design of the proposed structures and equipment supports;
- Provide consultation to the RE during design and construction of the project;
- Monitor construction progress to ensure compliance with LORS;
- Evaluate and recommend necessary changes in design; and
- Prepare and sign all major building plans, specifications and calculations.

D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**GEN-6** Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s)

who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The special inspector shall:

- Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
- Observe the work assigned for conformance with the approved design drawings and specifications;
- Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
- Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

**Verification:** At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

**GEN-7** The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The

discrepancy documentation shall reference this condition of certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

**Verification:** The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

**GEN-8** The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections.]

**Verification:** Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

**GEN-9** The project owner shall file a closure/decommissioning plan with San Bernardino County and the City of Redlands and the CPM for review and approval at least 12 months (or other mutually agreed to time) prior to commencing the closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

The closure plan shall include a discussion of the following:

- The proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- All applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- Activities necessary to restore the site if the MVPP decommissioning plan requires removal of all equipment and appurtenant facilities; and
- Closure/decommissioning alternatives, other than complete restoration of the site.

**Verification:** At least 12 months prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with San Bernardino County and the City of Redlands and the CPM for review and approval.

Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

**CIVIL-1** Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

- Design of the proposed drainage structures and the grading plan;
- An erosion and sedimentation control plan;
- Related calculations and specifications, signed and stamped by the responsible civil engineer; and
- Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

**Verification:** At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

**CIVIL-2** The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4, Stop orders.]

**Verification:** The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

**CIVIL-3** The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

**Verification:** Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

**CIVIL-4** After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy.]

**Verification:** Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

**STRUC-1** Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

- Major project structures;
- Major foundations, equipment supports and anchorage;
- Large field fabricated tanks; and
- Turbine/generator pedestal.

In addition, the project owner shall, prior to the start of any increment of construction, get approval from the CBO of the lateral force procedures proposed for project structures to comply with the lateral force provisions of the CBC.

The project owner shall:

- Obtain approval from the CBO of lateral force procedures proposed for project structures;
- Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently

with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];

- Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (or a lesser number of days mutually agreed to by the project owner and the CBO), prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents.]; and
- Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record.]

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

**STRUC-2** The project owner shall submit to the CBO the required number of sets of the following:

- Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
- Concrete pour sign-off sheets;
- Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
- Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
- Reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special

Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

**Verification:** If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

**STRUC-3** The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

**Verification:** On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

**STRUC-4** Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. Chapter 16, Table 16-K of the 1998 CBC requires use of the following seismic design criteria:  $I = 1.25$ ,  $I_p = 1.5$  and  $I_w = 1.15$ .

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**MECH-1** Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design

drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.]

The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:
  - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
  - ANSI B31.2 (Fuel Gas Piping Code);
  - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
  - ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
  - Specific City/County code.

The CBO may require the project owner to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation [1998 CBC, Section 104.2.2, Deputies.]

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**MECH-2** For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the

appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**MECH-3** Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record.]

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC

and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**MECH-4** Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.]

The project owner shall design, fabricate and install:

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and
2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

The final plans, specifications and calculations shall clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

**ELEC-1** For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The following activities shall be reported in the Monthly Compliance Report:

- receipt or delay of major electrical equipment;
- testing or energization of major electrical equipment; and
- the number of electrical drawings approved, submitted for approval, and still to be submitted.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

**ELEC-2** The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C [CBC 1998, Section 106.3.2, Submittal documents.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

A. Final plant design plans to include:

- one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
- system grounding drawings;
- general arrangement or conduit drawings; and
- other plans as required by the CBO.

B. Final plant calculations to establish:

- short-circuit ratings of plant equipment;
- ampacity of feeder cables;
- voltage drop in feeder cables;

- system grounding requirements;
- coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
- system grounding requirements;
- lighting energy calculations; and
- other reasonable calculations as customarily required by the CBO.

Protocol: C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

**Verification:** At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

## REFERENCES

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MVPP (Mountainview Power Company, LLC) 2000a. Application for Certification, Volumes I and II, Mountainview Power Plant Project (00-AFC-2). Submitted to the California Energy Commission on February 1, 2000.

# POWER PLANT RELIABILITY

Steve Baker

## INTRODUCTION

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In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

- The scope of this power plant reliability analysis covers:
- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Mountainview Power Company LLC (MVPC) has predicted a level of reliability for the power plant (see below), staff believes MVPC should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

## SETTING

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In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange (PX) to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is currently being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. “Must-run” power purchase agreements and “participating generator” agreements are two mechanisms being employed to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO’s mechanisms to ensure adequate power plant reliability apparently are being devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

MVPC proposes to operate the 1,056 MW Mountainview Power Plant (MVPP) at baseload, selling energy and capacity on the market and via bilateral contracts. In addition, the MVPP will provide load following and peaking power (MVPC 2000a, AFC §§ 1.1, 2.2.4, 5.3, 5.3.1). The project is expected to operate at an overall availability from 90 to 98 percent (MVPC 2000a, AFC §§ 2.4.1, 2.4.2, 2.4.3).

## ANALYSIS

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A reliable power plant is one that is available when called upon to operate. Throughout its intended life, the MVPP will be expected to perform reliably in baseload, load following and peaking duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for

maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the MVPP will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

## **EQUIPMENT AVAILABILITY**

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

### ***QA/QC PROGRAM***

The applicant describes a QA/QC program (MVPC 2000a, AFC §§ 2.2.3.1, 2.4.3) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' histories and quality control and inspection programs will be evaluated. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

## **PLANT MAINTAINABILITY**

### ***EQUIPMENT REDUNDANCY***

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

MVPC plans to provide appropriate redundancy of function for the combined cycle portion of the project (MVPC 2000a, AFC §§ 2.4.3, 2.10.4, 2.10.8; Table 2.4-1). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers and inverters. Other balance of plant equipment will be provided with redundant examples, thus:

- two 100 percent boiler feed pumps;
- two 100 percent condensate pumps;
- two 50 percent circulating water pumps;
- two 50 percent hydrogen cooling pumps;
- two 100 percent service water pumps;

- two 100 percent closed loop cooling water pumps;
- two 100 percent closed loop cooling water heat exchangers; and
- two 100 percent instrument air compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

### ***MAINTENANCE PROGRAM***

MVPC proposes to establish a plant maintenance program typical of the industry (MVPC 2000a, AFC §§ 2.2.3.1, 2.4.2). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. For example, each gas turbine will be scheduled for eight days per year off-line (at times of low electricity demand) in order to perform annual inspections and cleaning. Every third year, each gas turbine will undergo a hot gas path inspection lasting up to four weeks. Every sixth year, each gas turbine will undergo a major maintenance turnaround lasting at least four weeks. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

### **FUEL AND WATER AVAILABILITY**

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

#### ***FUEL AVAILABILITY***

The MVPP will burn natural gas from the Southern California Gas Company (SoCalGas) system. Gas will be transmitted to the plant via a new 17-mile long 24- to 30-inch diameter pipeline from SoCalGas's pipeline 4000/4002 near Etiwanda Avenue in Rancho Cucamonga (MVPC 2000a, AFC §§ 1.3, 2.1, 2.52.11.1). This natural gas system, which provides access to gas from the Rocky Mountains, Canada and the Southwest, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (MVPC 2000a, AFC § 2.5). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

#### ***WATER SUPPLY RELIABILITY***

The MVPP will obtain water for cooling and other plant uses from one or more of three sources; new on-site groundwater wells, offsite Gage Canal Water Company wells, or secondary effluent from the City of Redlands wastewater treatment plant (MVPC 2000a, AFC §§ 1.3, 2.2.1, 2.11.2, 2.13.2). Staff believes this source yields sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see that portion of this document entitled **Water Resources**.)

## POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation (see those portions of this document entitled **Facility Design** and **Geology and Paleontology**).

### **FLOODING**

The project site does not lie within either a 100-year or a 500-year flood zone (MVPC 2000a, AFC §§ 2.3.1, 2.12.1). This does not present a credible threat of flooding. For further discussion, see that portion of this document entitled **Geology and Paleontology**.

### **SEISMIC SHAKING**

The site lies within Seismic Zone 4 (MVPC 2000a, AFC §§ 2.3.1, 2.7.8, 2.12, 2.12.1; Appendix D, § 4.2.7); see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

## COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (<http://www.nerc.com>). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

### **For Combined Cycle units (All MW sizes)**

Availability Factor = 91.49 percent

The gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor of 90 to 98 percent (MVPC 2000a, AFC §§ 2.4.1, 2.4.2, 2.4.3) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the

plant will consist of four parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

## **FACILITY CLOSURE**

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Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

## **CONCLUSION**

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The applicant predicts an equivalent availability factor of 90 to 98 percent, which staff believes is achievable in light of the industry norm of 91 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

## **REFERENCES**

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MVPP (Mountainview Power Company LLC). 2000a. Submittal of Application for Certification, Mountainview Power Plant. Submitted to the California Energy Commission, February 1, 2000.

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

GTW (Gas Turbine World). 1999. *Gas Turbine World*, September-October 1999, pp. 20-23.

Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation, an Executive Report*, 1994.

NERC (North American Electric Reliability Council). 1999. 1994-1998 Generating Availability Report.

# POWER PLANT EFFICIENCY

Steve Baker

## INTRODUCTION

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The Energy Commission makes findings as to whether energy use by the Mountainview Power Plant (MVPP) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the MVPP's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

No federal laws apply to the efficiency of this project.

### STATE

#### ***CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES***

CEQA Guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

### LOCAL

No local or county ordinances apply to power plant efficiency.

## SETTING

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Mountainview Power Company LLC (MVPC) proposes to construct and operate a (nominal) 1,056 MW combined cycle merchant power plant to generate baseload, load-following and peaking power, selling directly to customers through bilateral contracts or on the spot market (MVPC 2000a, AFC §§ 1.1, 2.2.4, 5.3, 5.3.1). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity will differ from, and may exceed, this figure.) The MVPP will consist of four General Electric Frame 7F combustion turbine generators with evaporative inlet air coolers producing approximately 167 MW each, two triple pressure heat recovery steam generators (HRSGs) with duct burners, and two 209 MW reheat steam turbine generators, arranged in two two-on-one combined cycle trains, totaling approximately 1,056 MW. The gas turbines and HRSGs will be equipped with dry low-NOx combustors and selective catalytic reduction to control air emissions (MVPC 2000a, AFC §§ 1.1, 1.3, 2.1, 2.2.1, 2.2.3.2, 2.2.3.3, 2.2.3.4, 2.4.1, 2.9.1).

## ANALYSIS

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### ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

### ***PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY***

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The MVPP will burn natural gas at a nominal rate up to 88 billion Btu per day LHV<sup>1</sup> (MVPC 2000a, AFC Table 2.2-1; § 2.5). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated at a full load efficiency of approximately 54 percent LHV (MVPC 2000a, AFC Table 2.2-1; § 2.6); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

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<sup>1</sup> Lower heating value.

## ***ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES***

The applicant has described its sources of supply of natural gas for the MVPP (MVPC 2000a, AFC §§ 1.3, 2.2.3.2, 2.5). The project will burn natural gas from the existing Southern California Gas Company (SoCalGas) pipeline 4000/4002. The gas supply infrastructure is extensive, offering access to vast reserves of gas from the Rocky Mountains, Canada and the Southwest. This source represents far more gas than would be required for a project this size. Energy Commission predictions are that natural gas supplies will be adequate for many years into the future. It is therefore highly unlikely that the MVPP could pose a substantial increase in demand for natural gas in California.

## ***ADDITIONAL ENERGY SUPPLY REQUIREMENTS***

Natural gas fuel will be supplied to the project by a new 17-mile long 24- to 30-inch diameter pipeline connecting with the existing SoCalGas pipeline 4000/4002 near Etiwanda Avenue in Rancho Cucamonga (MVPC 2000a, AFC §§ 1.3, 2.1, 2.5, 2.11.1). This line should provide adequate access to natural gas fuel. There is no real likelihood that the MVPP will require the development of additional energy supply capacity.

## ***COMPLIANCE WITH ENERGY STANDARDS***

No standards apply to the efficiency of the MVPP or other non-cogeneration projects.

## ***ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION***

The MVPP could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

## ***PROJECT CONFIGURATION***

The MVPP will be configured as a compound-train combined cycle power plant, in which electricity is generated by four gas turbines, and additionally by two reheat steam turbines that operate on heat energy recuperated from the gas turbines' exhaust (MVPC 2000a, AFC §§ 1.3, 2.1, 2.2.1, 2.2.3.3, 2.2.3.4, 2.4.1). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back.

Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one or more gas turbines. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as load-following and peaking duty. Loads down to 25 percent of full load allow one gas turbine, operating at full load, and the steam turbine to operate at peak efficiency.

## **EQUIPMENT SELECTION**

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the MVPP represent some of the most modern and efficient such machines now available. The applicant will employ two General Electric Frame 7FA combined cycle power trains (MVPC 2000a, AFC §§ 1.3, 2.1, 2.2.1, 2.2.3.3). Offered in a two-on-one configuration as the S207FA, this machine is nominally rated at 530 MW per train and 56.5 percent efficiency LHV at ISO<sup>2</sup> conditions (GTW 1999b).

One possible alternative machine is the ABB Alstom Power KA 24, an F-class gas turbine nominally rated at 271 MW and 57.6 percent efficiency at ISO conditions in a one-on-one combined cycle configuration (GTW 1999b).

Another alternative is the Siemens-Westinghouse 501F, nominally rated in a two-on-one combined cycle at 550 MW and 55.8 percent efficiency LHV at ISO conditions. This machine is functionally equivalent to the GE Frame 7FA.

While the KA 24 promises slightly higher fuel efficiency (57.6 percent at ISO conditions) (GTW 1999b) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft, generating a nominal 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage.

## **EFFICIENCY OF ALTERNATIVES TO THE PROJECT**

The project objectives include the flexibility to generate baseload, load following and peaking power for sale on the spot market or via bilateral contracts (MVPC 2000a, AFC §§ 1.1, 2.2.4, 5.3.1).

### ***Alternative Generating Technologies***

The applicant addresses alternative generating technologies in its application (MVPC 2000a, AFC § 5.3.2). Natural gas- and coal-burning, nuclear fission and fusion, solar, wind, hydroelectric, magnetohydrodynamic, fuel cell and geothermal technologies are all considered. One of the project's stated objectives is to

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<sup>2</sup> International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

compete as a merchant plant (MVPC 2000a, AFC §§ 1.1, 2.2.4, 5.3.1). Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

### ***Natural Gas-Burning Technologies***

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is a G-class machine, such as the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. While the 501G is rated at 58 percent efficiency (GTW 1999b), 1.5 percentage points higher than the 7FA, the G machine in a one-on-one combined cycle produces 365 MW to the 7FA's two-on-one configuration at 530 MW. A 520 MW (nominal) power plant would thus be impractical; a 365 MW power plant, without redundant gas turbines, would restrict operating flexibility. Additionally, the 501G is brand new; the first such machine only recently began operation at a site in Florida owned by Lakeland Electric and Water (Power 1999), and a second such machine is in construction at PG&E Generating's Millennium project in Charlton, Massachusetts. Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant may frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class gas turbine is an H-class machine. The first such plant is now in the permitting stage; Sithe Energies will build an 800 MW facility in Scriba, New York, based on two General Electric Frame 7H gas turbine generators in a two-on-one configuration (GTW 1999a). Claimed fuel efficiency is 60 percent LHV at ISO conditions (GTW 1999b). This high efficiency is achieved through a higher pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. This first Frame 7H application is not expected to enter service until the end of 2002. Given the lack of proven performance, and the reduction in operating flexibility from fewer gas

turbines (one 7H combined cycle would produce 400 MW), staff agrees with the applicant's decision to employ F-class machines.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ evaporative cooling (MVPC 2000a, AFC §§ 1.3, 2.1, 2.2.1, 2.2.3.3). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (two-train combined cycle) and generating equipment (F-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

## **CUMULATIVE IMPACTS**

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the MVPP. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the MVPP will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the MVPP. California's electric power will be generated by those power plants that bid most successfully to sell their output to the California Power Exchange. Since no significantly more efficient power plants are envisioned to compete against the MVPP, no indirect impacts are likely.

## **FACILITY CLOSURE**

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Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator and Power Exchange to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

The MVPP, if constructed and operated as proposed, would generate 520 MW of electric power at an overall project fuel efficiency around 54 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the MVPP would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

### RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the MVPP. No Conditions of Certification are proposed.

### REFERENCES

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# TRANSMISSION SYSTEM ENGINEERING

Mark Hesters and Al McCuen

## INTRODUCTION

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The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's decision. This preliminary staff assessment indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The Mountainview Power Company, Limited Liability Company (MVPC), the applicant, proposes to connect their project, the Mountainview Power Project (MVPP) to Southern California Edison's (Edison) transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff is primarily a facilitator, coordinating the Cal-ISO's process and results with the certification process and the Energy Commission decision. The Cal-ISO will provide testimony at the Energy Commission's hearings.

Staff's analysis also evaluates the power plant switchyard, outlet line, termination facilities and outlet alternatives identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and potential closure of the project.

Public Resources Code, section 25523 requires the Energy Commission to "prepare a written decision...which includes: ...findings regarding conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (CCR, tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order

ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.
- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability

implications of the MEC project. Also of major importance to projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine the actual net power output required by the generating units to meet their scheduled obligations. (Cal-ISO 1998a, Cal-ISO 1998b).

- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

## **PROJECT DESCRIPTION**

The MWPP will result in a nominal increase in electrical output of approximately 1055 megawatts (MW) at Cal-ISO conditions. The plant includes two new units (3 and 4) and the refurbishment of the two existing units (1 and 2) at the San Bernardino power plant. The total output of the new and refurbished units will be 1,188 MW. The new units will be located next to the existing San Bernardino generating units and adjacent to the existing San Bernardino substation in unincorporated San Bernardino County (MVPP, 2000a, page 1-1)

The applicant will connect the new generators to existing, open 230 kV bays at Edison's San Bernardino substation. The units will each connect directly to the 230 kV bus at the San Bernardino substation.

## **PROJECT SWITCHYARD**

The project will use the existing San Bernardino switchyard/substation adjacent to the power plant and will not require a new switchyard. The substation includes 115 kV and 230 kV facilities. The 230 kV bus at the San Bernardino substation has seven bays. Four of the bays connect to existing lines, the remaining three bays will be used by the MVPP. The existing San Bernardino generating units, 1 and 2, currently connect to the 115 kV bus at the substation. When the units are refurbished their connection to the 115 kV bus will be moved to a single bay at the 230 kV bus. The new units, 3 and 4, will connect to the other vacant bays at the 230 kV bus (MVPP 2000a, pages 2-46 to 2-47)

Short-circuit analyses are conducted to assure that breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The switchyard components will be rated in accordance with the results of

a short-circuit study. The acceptability of breaker ratings will be verified during the compliance phase of the certification process.

### ***TRANSMISSION LINE CHARACTERISTICS***

Three 230 kV transmission lines will interconnect the generators step up transformers to the San Bernardino substation using overhead lines. These overheads will vary in length but will be approximately one thousand feet long. One of these lines will serve the existing generating units, 1 and 2; one will serve unit three and one unit four. The conductor will be similar to 1033 KCM ACSR. The final designed transmission circuit will be sized to accommodate continuous full plant output, and line construction will meet or exceed GO-95 specifications, in accordance with the conditions of certification specified in **TSE-1a** and **TSE-1d**.

### ***ALTERNATIVE TRANSMISSION LINE ROUTES***

The MVPC did not analyze other transmission line routes because connecting to the adjacent substation keeps both costs and impacts to a minimum.

### **EXISTING FACILITIES AND RELATED SYSTEMS**

The attached, Figure 1, illustrates existing electric facilities located near the MVPP project site (the figure is not currently be available). Specific facilities in close proximity to the interconnection include:

- The 230 kV lines leaving the San Bernardino substation are owned by Edison and include, the two circuits of the San Bernardino to Devers 230 kV line, the San Bernardino to Etiwanda 230 kV line and the San Bernardino to Vista 230 kV line.
- There are several 115 kV and 69 kV lines owned by Edison that enter the San Bernardino substation.

### **SYSTEM RELIABILITY**

#### ***INTRODUCTION***

A system reliability study is performed to determine the affects of connecting a new power plant to the existing electric grid. The study identifies impacts and also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities, required for connecting a project to the grid are considered part of the project and are subject to the full AFC review process.

The System Impact Study for the MVPP in conjunction with the Cal-ISO's preliminary approval letter indicate whether or not there will be significant transmission facilities, beyond those previously described in the MVPC AFC, required for the interconnection of the MVPP. The System Impact Study for the MVPP found no line overloads under normal conditions and one line overloaded under emergency conditions. This overload will require mitigation through the implementation of an operating procedure which reduces the output from the

MVPP whenever both the San Bernardino-Vista and Etiwanda-San Bernardino lines are out of service (MVPP 2000a, page 2-53). **Condition of Certification 1-g** requires the MVPC to participate in the operating procedure.

## **SYSTEM RELIABILITY STUDY**

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies may be performed to verify that sufficient reactive power (see Definition of Terms) is available. The reliability evaluation must be conducted for all credible “emergency” conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A Detailed Facilities Study (DFS) is conducted in advance of potential system changes, such as the addition of the MVPP project into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria.

The System Impact Study for the MVPP indicates that there is one line overload problem caused by MVPP. One line overloads when two lines are out of service. The Devers-San Bernardino No. 1 230 kV line overloads to 125% of its rated capacity when the San Bernardino-Vista and the Etiwanda-San Bernardino 230 kV lines are out of service. Reducing the output of the MVPP by 180 MW can mitigate this overload. No other overloads occur, thus, no new facilities are required.

Short-circuit analyses are conducted to assure that breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The System Impact study indicated that many breakers would need to be replaced, including, twenty-one 230 kV breakers at the Vista substation and seven breakers at the San Bernardino switchyard. Edison will determine the final number and cost of the breaker replacements in the Facility Study for the MVPP. Generally when circuit breakers are not adequate the applicant must replace them. The replacement of circuit breakers is usually a “within the fence” modification and does not warrant further environmental analysis. Staff expects the short-circuit analysis will show that many circuit breakers near the San Bernardino substation will need to be replaced and **Condition of Certification 1-b** requires compliance with the recommendations of the Cal-ISO when the results of the study are available (CE-ISO, pages 1 and 2).

## **CUMULATIVE IMPACTS**

Staff does not expect any cumulative impacts resulting from the operation of the MVPP and other proposed power plants in the main Edison area of southern California. Except for a few radial networks, the Edison electric system is highly redundant<sup>1</sup> and will be able to accommodate the generation of many new power

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<sup>1</sup> The main Edison network is highly interconnected with many lines over which power can flow. Thus the generation from new plants is dispersed throughout the network limiting the impact of new generation on specific transmission lines.

plants without requiring downstream electric facilities. Currently there are no plants proposed electrically near the MVPP. Impacts from plants located outside the main Edison system are electrically isolated from the MVPP and will not have associated cumulative impacts.

There are only two power plant projects currently seeking commission certification, the Pastoria Energy Facility (PEF) and the Nueva Azalea Power Plant Project (NAPPP) in the area. Other potential projects include the Redondo Beach Modernization and the El Segundo Power Redevelopment Project. The PEF is located in one of Edison's radial transmission networks and is essentially isolated from the rest of the Edison network for reliability analysis. The other projects, NAPPP, the Redondo Beach Modernization and the El Segundo Power Redevelopment Project all connect to the main Edison electric network which due to its highly redundant nature can accommodate the addition of many new power plants. Other potential plants in California are electrically isolated from the main Edison network from a reliability impacts perspective.

Projects proposed in northern California<sup>2</sup> are electrically distant and isolated from the MVPP. The northern California projects connect to Pacific Gas and Electric's (PG&E) transmission network and the impacts of these projects are essentially, electrically isolated from MVPP. In order for power generated by MVPP to impact the same lines as the northern California projects it must flow into the Edison main network and through the Vincent substation towards northern California on the bulk power system. Once on the bulk transmission system, the power generated by MVPP could increase congestion on Path 15<sup>3</sup> but would not have significant reliability impacts.

The MVPP is electrically distant and isolated from the Otay Mesa Power Plant Project. Power generated by MVPP would need to travel through the Edison transmission network and the South of SONGS (San Onofre Nuclear Generating Station) path before it could impact the same transmission lines as the Otay Mesa Power Plant Project. This distance effectively separates the impacts of the two power plants.

## **FACILITY CLOSURE**

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The parallel operation of generating stations is controlled in part by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the San Bernardino substation) and general control over the interconnected generators. Prior to

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<sup>2</sup> Potential plants in northern California include, La Paloma Generating Project, the Sunrise Cogeneration and Power Project, the Elk Hills Generating Project, the Midway-Sunset Cogeneration Company Project, the Los Medanos Energy Center, The Metcalf Energy Center, the Three Mountain Power Project, the Contra Costa Modernization Project, the Delta Energy Facility, the Sutter Power Plant, and the Moss Landing Modernization Project.

<sup>3</sup> Path 15 is the set of lines that limit the import of power into Northern California from Southern California and hence the Southwestern United States.

construction and interconnection of a generating unit, the PTO reviews and comments on the plans and specifications for the power plant and termination equipment that is important to safe and reliable parallel operation<sup>4</sup> and inspects the interconnection facilities. Contractual provisions may be developed to provide backup, or other power services, and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, the PTO and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that “lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property.” A condition of certification will require compliance with this rule. The ability of the above LORS to reasonably assure safe and reliable conditions, in the event of facility closure, was evaluated for three scenarios:

## **PLANNED CLOSURE**

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the requirement for the owner to provide a closure plan 12 months prior to closure, in conjunction with applicable LORS, is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO<sup>5</sup> to assure (as one example) that the PTO’s system will not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads.<sup>6</sup>

## **UNEXPECTED TEMPORARY CLOSURE**

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see General Conditions Including Compliance Monitoring and Closure Plan).

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<sup>4</sup> As an example, the PTO has control over the generating unit breakers so that only when the PTO’s line crews have completed maintenance, for instance, and are clear of the line or other facilities, could the unit reclose the system.

<sup>5</sup> The PTO, in this instance, is Edison, e.g., the system owner to which the project is interconnected.

<sup>6</sup> These are mere examples, many more exist.

## UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan, that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities, will be developed to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

- Staff's findings indicate that no significant additional new facilities will be required for interconnection of the MVPP project to meet NERC, WSCC, and Cal-ISO reliability criteria.
- The Cal-ISO will confirm staff's conclusion upon issuance of the final interconnection approval.
- The power plant outlet lines and termination are acceptable and will comply with LORS assuming the conditions of certification are implemented.
- The Cal-ISO will provide testimony on the preliminary approval letter at the Commissions hearings.
- The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. A condition of certification TSE-1h provides for Energy Commission review of the Cal-ISO final interconnection approval letter and the Edison/applicant Facility Interconnection Agreement.

### RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

### CONDITIONS OF CERTIFICATION

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**TSE-1** The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements listed below. The substitution of Compliance Project Manager (CPM) approved "equivalent" equipment and equivalent switchyard configurations is acceptable.

The power plant outlet lines and termination shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General

Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, National Electric Code (NEC), the Edison Interconnection Handbook and related Industry Standards.

Breakers and busses in the San Bernardino switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

The two new and one relocated transmission lines will be 230 kV overhead lines terminating at the San Bernardino substation

Termination facilities at the interconnection shall comply with applicable Cal-ISO and Edison interconnection standards (Edison Interconnection Handbook and CPUC Rule 21).

Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner’s standards.

The outlet line will use conductors similar to the 1033 kcmil ACSR conductors.

The applicant shall provide a Detailed Facilities Study including a description of remedial action scheme sequencing and timing, required operating procedures, and an executed Generator Special Facilities Agreement (GSFA) for the transmission interconnection with Edison. The Detailed Facilities Study and GSFA shall be coordinated with the Cal-ISO.

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM:

Design drawings, specifications and calculations conforming with CPUC General Order 95 and related industry standards, where applicable, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

For each element of the transmission facilities as identified above, the submittal package to the CPM shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on “worst case conditions” and a statement by the registered engineer in responsible charge (signed and sealed) that the transmission element(s) will conform with CPUC General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, the NEC, Edison Interconnection Handbook, CPUC Rule 21 and related industry standards.

Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements a

through h above. The Detailed Facilities Study and GSFA shall concurrently be provided. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

**TSE-2** The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1g of TSE-1, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment; transmission facilities or switchyard configurations shall not begin without prior written approval of the changes by the CPM.

Verification: At least 60 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements of TSE-1 and request approval to implement such changes.

**TSE-3** The project owner shall be responsible for the inspection of the transmission facilities during and after project construction and any subsequent CPM approved changes thereto, to ensure conformance with CPUC General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", the NEC, Edison Interconnection Handbook, CPUC Rule 21 and related industry standards. In case of non-conformance, the project owner shall inform the CPM in writing within 10 days of discovering such non-conformance and describe the corrective actions to be taken

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM:

- "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", the NEC, Edison Interconnection Handbook, CPUC Rule 21 and related industry standards, and these conditions shall be concurrently provided.
- An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge.
- A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in responsible charge.

## REFERENCES

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- Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.
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- NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.
- WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.
- MVPC (Mountainview Power Plant Project/Andrews) 2000a. Submittal letter to AFC. Submitted to the California Energy Commission on February 1, 2000.

## DEFINITION OF TERMS

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AAC	All Aluminum conductor.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires, 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcm	Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.
Kilovolt (kV)	A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
Loop	An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

**Megavolt ampere (MVA)**

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

**Megawatt (MW)**

A unit of power equivalent to 1,341 horsepower.

**Normal Operation/ Normal Overload**

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

**N-1 Condition**

See Single Contingency.

**Outlet**

Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

**Power Flow Analysis**

A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

**Reactive Power**

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

**Remedial Action Scheme (RAS)**

A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

**SF6**

Sulfur hexafluoride is an insulating medium.

**Single Contingency**

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

**Solid dielectric cable**

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

**Switchyard** A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

**Thermal rating**  
See ampacity.

**TSE** Transmission System Engineering.

**Undercrossing**  
A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

**Underbuild**  
A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

Place Holder for Figure when Available



# ALTERNATIVES

Kevin Kennedy, Ph.D.

## INTRODUCTION

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The California Environmental Quality Act (CEQA) allows a state agency, such as the California Energy Commission, to utilize its own “regulatory program” review process in lieu of the “environmental impact report” (EIR) review process specified in CEQA. However, to do so the agency’s regulatory program must be “certified” by the Secretary of the Resources Agency. (Public Resources Code Section 21080.5). The Energy Commission’s Power Plant Siting Regulatory Program is such a “certified regulatory program” under CEQA.

With regard to the “Alternatives” analysis required in a certified siting proceeding such as the Mountainview Power Company’s (MVPC) application, the CEQA Guidelines (Cal. Code Regs., tit. 14, Section 15252) state that:

“ The document used as a substitute for an EIR or negative declaration in a certified program shall include at least the following items:

(b) Either:

- (1) Alternatives to the activity and mitigation measures to avoid or reduce any significant or potentially significant effects that the project might have on the environment, or
- (2) A statement that the agency’s review of the project showed that the project would not have any significant or potentially significant effects on the environment and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment. This statement shall be supported by a checklist or other documentation to show the possible effects that the agency examined in reaching this conclusion.”

The Warren-Alquist Act specifies that a party filing an “Application for Certification” of a natural gas fired power plant “modification” (such as the MVPC project) is not required to provide any information *in its application* on alternative *sites* for the proposed facility. (Public Resources Code Section 25540.6(a) and (b)). However, the Energy Commission’s Siting Regulations (Cal. Code Regs., tit. 20, Section 1765) require that:

“At the hearings . . . on an application exempt from the [Notice Of Intent] requirements pursuant to Public Resources Code section 25540.6, the parties shall present information on the feasibility of available site and facility alternatives to the applicant’s proposal which substantially lessen the significant adverse impacts of the proposal on the environment. . . .”

In light of these provisions, staff presents information in this section on the “feasibility of available site and facility alternatives to the applicant’s proposal that substantially lessen the significant adverse impacts of the proposal on the

environment” (Cal. Code Regs., tit. 20, §1765). Staff also analyzes whether there are any feasible alternative designs or alternative technologies, including the “no project alternative,” that may be capable of reducing or avoiding any potential impacts of the proposed project while achieving its major objectives.

## SCOPE AND METHOD FOR THIS ALTERNATIVES ANALYSIS

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The CEQA Guidelines provide direction regarding the proper scope of an “alternatives” analysis by requiring evaluation of the comparative merits of “a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project objectives but would avoid or substantially lessen any of the significant effects of the project,” (Cal. Code Regs., tit. 14, §15126.6(a)). In addition, the analysis must address the “no project” alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the “rule of reason” which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The CEQA Guidelines specifically state that “Alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the [review] need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project.” (Cal. Code Regs., tit. 14., Section 15126.6(f))

To prepare this alternatives analysis, staff used the methodology summarized below:

- Identify the basic objectives and potential significant impacts of the project.
- Determine whether there are any feasible *site alternatives* for analysis by evaluating the extent to which most of the project objectives can be achieved at alternative sites and the degree to which any significant impacts of the project would be substantially lessened at such alternative sites.
- Identify and evaluate *facility design and related facilities alternatives* to the project as proposed.
- Identify and evaluate *technical alternatives* to the project. The principle project alternatives examined that do not require the construction of a natural gas-fired facility are increased energy efficiency (or demand side management) and the construction of alternative technologies (e.g. wind, solar, or geothermal).
- Evaluate the feasibility and impacts of not constructing the project (the “*no project*” alternative).

## STAFF’S ALTERNATIVES ANALYSIS

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Staff’s alternatives analysis begins by identifying the basic objectives of the project, describing the project and project setting, and listing potential significant impacts

from the project as currently proposed. The analysis then turns to a consideration of various alternatives to the proposed MVPC project. These alternatives were developed in response to information received from the Energy Commission's staff and from other agencies.

## **BASIC OBJECTIVES OF THE PROJECT**

After studying the applicant's Application for Certification (AFC), staff has determined that the project's major objectives are:

- to construct and operate a merchant power plant to supply economically competitive electricity in the Southern California market at the lowest practicable cost and environmental impact;
- to help meet expected growth in electrical demand in San Bernardino and Riverside Counties; and
- to minimize the impacts and related costs of the project by making use of an existing power plant site and related local infrastructure to the extent feasible.

Staff recognizes that applicant's stated objectives include taking "advantage of the existing site and area infrastructure" (MVPC 2000a, AFC page 1-5). Existing infrastructure in the immediate vicinity of the project site does not include adequate natural gas supplies for the needs of the project. MVPC proposes a 17-mile long pipeline connection to the Southern California Edison natural gas pipeline near Etiwanda Avenue in Rancho Cucamonga (MVPC 2000a, AFC page 2-37). For this reason, staff has determined that making use of local infrastructure *to the extent feasible* is a clearer statement of the project's objectives.

## **PROJECT DESCRIPTION AND SETTING**

A more complete description of the project and its setting is presented in the **Project Description** section of this document.

### ***PROJECT SITE***

MVPC proposes to construct a nominal net 1,056 megawatt (MW) natural gas fired electrical generation facility on approximately 54 acres in San Bernardino County (MVPC 2000a, AFC page 1-1). MVPC currently owns 16.3 acres of the site, where it operates two gas-fired steam-generating units with a gross nominal capacity of 66 MW each. MVPC is currently negotiating with Southern California Edison (SCE) to purchase approximately 38 acres of the adjoining parcel. SCE would retain ownership of the remainder of the parcel, where it operates a transmission switchyard.

The project site is located at the northeast corner of San Bernardino Avenue and Mountain View Avenue in unincorporated San Bernardino County. The project site is bordered on the north by agricultural land, on the east by a SCE switchyard and transmission lines, agricultural land to the south, and residences and light industry on the west. The City of Redlands is in the process of annexing the project site. The project site is currently zoned by San Bernardino County as regional industrial (MVPC 2000a, AFC page 6.3-1). The City of Redlands General Plan designates

the site as industrial. The city's pre-zoning designation for the site, pending annexation, is general industrial.

## ***POWER PLANT***

MVPC proposes to build two new natural gas fired combined cycle generating units with a combined net nominal capacity of 1,056 MW (MVPC 2000a, AFC page 1-6). Each unit will have two F-class combustion gas turbine-generator/heat recovery steam generator combinations that will provide steam to a steam turbine. The project will also include two 200-foot exhaust stack structures and four new cooling towers, two of which will replace the existing cooling towers on-site. The existing gas fired boilers and steam turbines will remain in place without modification, except for modified NO<sub>x</sub> emission controls.

## ***RELATED FACILITIES***

### **TRANSMISSION SYSTEM INTERCONNECTION**

The project site is located adjacent to an existing SCE-owned 230 kilovolt (kv) switchyard. MVPC plans to connect directly to this switchyard through new connections. No new transmission lines or transmission line upgrades are planned as part of this project (MVPC 2000a, AFC page 1-6).

### **NATURAL GAS SUPPLY PIPELINE**

MVPC proposes to connect to the Southern California Gas pipeline that runs along Etiwanda Avenue in Rancho Cucamonga using a 17-mile long pipeline (MVPC 2000a, AFC page 2-37). This pipeline would run along existing roadway right-of-ways through Colton, Fontana, Rialto, San Bernardino, and into the plant site.

### **RAW WATER SUPPLY**

Water requirements for the project are 4,665 gallons per minute at full operation and will be supplied from a combination of sources. MVPC initially proposed to use a combination of high-quality groundwater from two existing on-site wells and from deliveries from the Gage Canal Water Company (MVPC 2000a, AFC page 2-43).

As discussed in more detail in the **Soil and Water Resources** section of this document, MVPC has now agreed to use a different source of water than originally proposed in its application. A minimum of 50% of requirements will be supplied through the use of secondary effluent from the City of Redlands Wastewater Treatment Plant (WWTP). The other water supply sources for the plant will be onsite groundwater derived from two existing wells located on the property site screened in the lower aquifer, and by 2 new wells to be drilled on site that will draw trichloroethylene-contaminated water from the middle aquifer. MVPC has agreed not to use the high-quality lower aquifer water in excess of current usage except under emergency conditions. MVPC proposes to install approximately 2.3 miles of new reclaimed water supply pipeline for transport of the secondary effluent. The applicant is proposing a wet cooling system.

## **WASTEWATER DISPOSAL**

Wastewater discharge will be sent through an existing 12-inch water pipeline and a proposed 1,100 foot connector to the Santa Ana Regional Interceptor (SARI) discharge line (MVPC 2000a, AFC page 2-38).

## **POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS**

In the Issues Identification Report (IIR), staff identified potential significant environmental effects of the proposed project on air quality, land use, and water resources (CEC 2000a). Since that time, additional information, including a change in the applicant's planned source of water, has caused staff to revise its assessment of some potential impacts. Staff's current assessment of the expected environmental consequences of the proposed project is summarized below for technical areas where issues have been identified. Staff's assessment is presented in more detail in the individual sections of this document.

### ***AIR QUALITY***

Staff initially identified air quality issues relating to emission reduction credits (ERCs) and Best Available Control Technology (BACT) that could have resulted in significant impacts or affected the project schedule. When staff filed the IIR, a portion of the necessary ERCs for the Mountainview Power Plant remained inadequately identified. Staff is currently satisfied that MVPC is making the progress needed to obtain sufficient ERCs to offset the project's emissions.

Staff also expressed concern in the IIR that MVPC's BACT analysis would not be considered sufficient by the U.S. Environmental Protection Agency (EPA). Staff worked with the MVPC, the air district, and the EPA during the Discovery and Analysis Processes to resolve these issues.

### ***BIOLOGICAL RESOURCES***

The proposed project may directly impact a variety of sensitive species known to occur in the project vicinity. The applicant has developed a mitigation strategy that seeks to maximize avoidance of impacts to sensitive species and their habitat (MVPC 2000a). MVPC has proposed mitigation measures that include items such as avoidance of riparian vegetation, implementation of a worker environmental awareness program, and the design of features to protect species from harm. Staff has determined that MVPC's recommended sensitive species impact avoidance measures have gone far in reducing potential impacts.

Staff has identified three issues that remained unresolved at this time. The U.S. Fish and Wildlife Service (USFWS) is expected to issue a Letter of Concurrence after completion of the applicant's Biological Assessment and informal consultation, but a formal Section 7 consultation may still be necessary. In addition, the need for the state Incidental Take Permit, which would be issued by the California Department of Fish and Game, has not yet been determined. Finally, additional biological surveys at the power plant site and along a portion of the natural gas route must be completed prior to construction, and appropriate mitigation implemented if sensitive

species are found. More information on these issues is provided in the **Biological Resources** section of this document.

## ***CULTURAL RESOURCES***

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed MVPC project has the potential to adversely affect both known and unknown cultural resources. MVPC has proposed mitigation measures to avoid significant impact to cultural resources. Staff concurs with the mitigation measures proposed by the applicant in the AFC and associated filings. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

## ***LAND USE***

In the IIR, staff identified one potential issue that could affect the timing of staff's analysis and of the project if not resolved in a timely fashion. The proposed site is currently located within unincorporated San Bernardino County. The City of Redlands is in the process of annexing the site. If the site were to remain under county jurisdiction, MVPC would need a variance to allow the proposed stack height. If the annexation is completed as anticipated and the project site were in the city, no variance will be needed for stack height. In addition, staff has identified other specific zoning requirements relating to street improvements, landscaping, and the natural gas pipeline that MVPC will need to comply with or receive variances from as it develops its construction plans and begins construction of the project.

An additional issue arose during staff's preparation of this document. The site is located approximately 4,000 feet from San Bernardino International Airport, formerly Norton Air Force Base. The Federal Aviation Administration has determined that the location of the 200-foot stacks at the project site does not pose a hazard to navigation at the airport. The San Bernardino International Airport expressed concern about the proximity of these stacks to the airport. The agencies have now agreed that the stacks will not present a problem for airport operations.

## ***TRAFFIC AND TRANSPORTATION***

The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases causing the LOS for various roadways to increase beyond LOS thresholds established by local and regional authorities. During the construction phase, increased commuter traffic caused by the workforce could also result in some traffic congestion. MVPC has proposed ways to reduce traffic impacts. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal. The natural gas pipeline and water supply line construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. Although all of these impacts are expected to be short-term they have the

potential to be significant. In the AFC, MVPC proposed to provide appropriate traffic control mitigation measures to avoid significant impacts from this construction activity. Based on staff's analysis, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur.

## ***VISUAL***

Current staff analysis has identified potentially significant visual impacts from two key observation points, the golf course located north of the Santa Ana River, between the project site and the San Bernardino International Airport, and the Santa Ana River flood control right-of-way, which is the proposed path of the local portion of the Santa Ana River Trail. MVPC included in its application mitigation measures for visual impacts, including its intention to work with the County of San Bernardino Department of Community and Cultural Resources to develop a landscape/grading plan to screen views of the project (MVPC 2000a, AFC page 6.6-46). Based on the information gathered to date, staff believes the visual impacts of the project can be mitigated to less than significant levels through the appropriate use of landscaping. A more detailed analysis of these impacts and their potential mitigation will be completed after staff receives the landscaping plan, which was requested from MVPC in August as part of the second round of data requests (CEC 2000e). Staff is also currently analyzing the impacts from possible plumes created by operation of the new power plant.

## ***WATER RESOURCES***

Staff identified potentially significant impacts resulting from MVPC's initial plan to use high quality water to supply the water needs of the power plant. These impacts included interference with neighboring wells, subsidence, and inducing the movement of contaminated groundwater into non-contaminated portions of the aquifer.

Since staff filed the IIR, MVPC has agreed to modify its water supply plans to use a combination of reclaimed water from the City of Redlands WWTP and degraded groundwater supplemented by limited quantities of high-quality deep aquifer groundwater. Staff does not believe that the project using these alternative sources of water poses significant impacts in the area of water resources.

## **ALTERNATIVES TO THE PROJECT**

As discussed above, the Energy Commission siting regulations require the parties in a siting case exempt from the Notice of Intention proceedings to present "information on the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment" (Cal. Code Regs., tit. 20 §1765).

### ***SITE ALTERNATIVES***

Consistent with the CEQA Guidelines, the scope of staff's consideration of alternative sites was guided by consideration of whether most project objectives could be accomplished at alternative sites, and whether locating the project at an alternative site would substantially lessen any identified significant impacts of the

project (Cal. Code Regs., tit. 14 §15126.6(a)). As discussed below, staff has determined that locating the project at an alternative site would not achieve one of the major objectives of the project and would not substantially lessen currently identified significant impacts of the project. Under these circumstances, staff has applied the “rule of reason” and decided that it need not perform a detailed analysis of alternative *sites*.

## **MEETING MAJOR OBJECTIVES OF THE PROJECT**

MVPC's basic objectives are to provide economically competitive electricity in Southern California while minimizing impacts and costs by making use of an existing power plant site and related infrastructure to the extent feasible. The project as proposed in the AFC would make use of much of the infrastructure of the existing site, including steam from the existing generating units, the existing water supply, former oil storage tanks, cooling tower foundations, and access to the adjacent SCE switchyard to connect to the transmission grid. The project will include the addition of two new combined cycle power plant units, the construction of a pipeline to supply natural gas, a new pipeline to supply reclaimed water from the Redlands WWTP, and a new wastewater pipeline connection. Since the AFC was filed, MVPC has agreed to use an alternative water source, which will require the development of two new on-site groundwater supply wells (see the **Soil and Water Resources** section of this document). As such, the project is a “modification” that will make substantial use of the existing site and infrastructure, but will also require key new infrastructure.

Based on this analysis, staff has determined that the proposed project makes substantial use of the existing infrastructure. A “stand-alone” combined cycle power plant at an alternative site that makes no use of the infrastructure at the existing site is possible. However, this alternative would not achieve one of the major objectives of this project, namely the avoidance of the significant impacts and costs of the project by using existing on-site infrastructure to the extent feasible.

## **REDUCING SIGNIFICANT ENVIRONMENTAL IMPACTS**

Staff's review of the proposed project has identified some potentially significant impacts. Staff's analysis of these impacts is discussed below. Staff's assessment has not identified any significant impacts that would be substantially lessened by locating the project at an alternative site.

### ***Air Quality***

Staff identified two air quality issues in the IIR. At the time the AFC was accepted, MVPC had not adequately identified the ERCs needed for the project, and staff was not satisfied that EPA would find MVPC's BACT analysis sufficient. Both issues have since been resolved, and neither would be affected substantially by locating the project at an alternative site.

### ***Biological Resources***

The proposed project may directly impact a variety of sensitive species known to occur in the project vicinity. The project as proposed includes mitigation measures

such as avoidance of riparian vegetation, implementation of a worker environmental awareness program, and the design of features to protect species from harm. Staff has determined that these measures reduce the potential for significant impacts. Staff has identified three issues that remained unresolved at this time. The U.S. Fish and Wildlife Service (USFWS) is expected to issue a Letter of Concurrence after completion of the applicant's Biological Assessment and informal consultation, but a formal Section 7 consultation may still be necessary. In addition, the need for the state Incidental Take Permit, which would be issued by the California Department of Fish and Game, has not yet been determined. Finally, additional biological surveys at the power plant site and along a portion of the natural gas route must be completed prior to construction, and appropriate mitigation implemented if sensitive species are found.

### ***Cultural Resources***

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed MVPC project has the potential to adversely affect both known and unknown cultural resources. Staff has determined that appropriate implementation of the mitigation measures proposed by MVPC will avoid significant impact to cultural resources.

### ***Land Use***

Staff noted in the IIR that the City of Redlands is in the process of annexing the project site. Without the annexation, MVPC would need to receive a variance from County of San Bernardino height limitations. Completion of the annexation is anticipated in late September. In addition, staff has identified other specific zoning requirements relating to street improvements, landscaping, and the natural gas pipeline that MVPC will need to comply with or receive variances from as it develops its construction plans and begins construction of the project. These issues do not represent a potentially significant impact of the project.

The San Bernardino International Airport also expressed concern about the proximity of the 200-foot stacks at the project site to the airport. The Federal Aviation Administration has determined that the stacks do not pose a hazard to navigation at the airport. The agencies have now agreed that the stacks will not present a problem for airport operations, eliminating this issue as a potentially significant impact.

### ***Traffic and Transportation***

The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases causing the LOS for various roadways to increase beyond LOS thresholds established by local and regional authorities. The natural gas pipeline and water supply line construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. Although all of these impacts are expected to be short-term they have the potential to be significant. In the AFC, MVPC proposed to provide appropriate traffic control mitigation measures to avoid significant impacts from this construction

activity. Based on staff's analysis, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur.

### ***Visual***

Staff has identified potentially significant visual impacts from two key observation points. In the AFC, MVPC proposed to develop a landscape/grading plan to screen views of the project as a visual mitigation measure. Based on the information gathered to date, staff believes the visual impacts of the project can be mitigated to less than significant levels through implementation of this landscape/grading plan. A more detailed analysis of the degree to which MVPC's proposed mitigation will reduce these impacts and will be completed after staff receives the landscaping plan.

### ***Water Resources***

The project as proposed in the AFC did impose potentially significant impacts on water supply through the use of large volumes of high-quality groundwater. The most feasible means of substantially reducing these impacts would be by identifying alternative water supplies or by reducing the project's use of water. Developing the project at an alternative site could assist in the identification or use of alternative water supplies. As discussed below in the Related Facilities Alternatives section, feasible alternative water supplies have been identified for the existing site. Therefore, the water resources impacts of the original proposal do not require analysis of alternative sites.

### ***"Site" Alternatives Conclusion***

Staff's analysis of alternative sites, presented above, is based on a review of the major objectives of the project, and the significant impacts identified in this document. Staff first considered whether the project's objectives could be accomplished at alternative sites. Staff found that while developing a similar project at an alternative site is possible, this would not minimize impacts and costs by making use of the existing site and infrastructure, which is one of the major objectives of the project. Staff also considered whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project. Locating a similar project at an alternative location would not substantially reduce any of the significant impacts of the project identified to date. Based on these two factors, staff has applied the "rule of reason" and determined that a detailed alternative sites analysis is not needed.

### ***FACILITY DESIGN ALTERNATIVES***

MVPC analyzed three facility design alternatives to its proposed project that made use of the existing facility but represented significant design differences from the proposal. Staff has considered those three alternatives as well, namely: simple replacement of the existing boilers, other base-load combined cycle capacity, and dry cooling.

## **REPLACEMENT OF EXISTING BOILERS**

The Mountainview Power Plant currently consists of two steam turbines fed by gas-fired boilers, each with a nominal gross capacity of 66 MW. MVPC considered replacing the existing equipment in kind as an alternative to adding two new combined cycle units. MVPC noted that this alternative could reduce fuel consumption and air emissions per unit of output compared to the existing plant, but that the combination of capital costs and plant efficiencies below 40% would make the plant's output uneconomical in California's deregulated electricity market. Replacement of the existing boilers is technically possible, but staff agrees that this alternative would not allow MVPC to compete effectively as a merchant power plant, which is one of the basic objectives of the project.

## **DIFFERENT BASE-LOAD COMBINED CYCLE CAPACITY**

MVPC proposes to construct two new combined cycle units, with nominal net added capacity of approximately 520 MW for each unit. MVPC considered both smaller and larger projects as alternatives. MVPC found that a single combined cycle unit would provide significantly fewer benefits than the proposed project while incurring most of the same impacts. MVPC also noted that the smaller project would result in higher per MW capital costs and higher per kWh operating costs. Staff finds that reducing the size of the project would not substantially reduce the identified significant impacts, but would substantially reduce the degree to which the project meets its objectives. The smaller project alternative is not preferable to the proposed project.

MVPC also considered a larger project that would consist of three combined cycle units. Such a project would require additional air emission offset credits that might not be locally available, additional electrical transmission facilities, and additional water resources. MVPC determined that solving these issues would be either impossible or too expensive to solve. Staff agrees that this alternative is, at best, marginally feasible and is not preferred to the proposed project.

## **DRY COOLING**

MVPC proposes to use a steam surface condenser, cooling tower and cooling water system for the plant's cooling system. MVPC proposed using water from the deep aquifer and from the Gage Canal Water Company, possibly supplemented by wastewater from the City of Redlands WWTP. The use of a combination of reclaimed water from the Redlands WWTP and degraded groundwater supplemented by limited quantities of high-quality deep aquifer groundwater is considered below as an alternative to the originally proposed water supply. As discussed below, this alternative water supply is preferred to the original proposal. Staff has compared the use of dry cooling to both the original proposal and to this preferred alternative.

MVPC considered the use of dry cooling as an alternative, but rejected this approach due to the availability of adequate water for wet cooling and the increased cost and decreased plant performance associated with dry cooling. Staff identified potentially significant impacts from the use of the originally proposed water sources.

Dry cooling, which would substantially reduce the volume of water needed for the project, would also substantially reduce these impacts. Dry cooling systems are, however, less efficient in rejecting heat, and generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser (Burns & Annett 1995). Both of these factors decrease the thermal efficiency and power output of the plant. In addition, capital costs of dry cooling towers, including ancillary systems, may cost two to four times that of a wet cooling tower. Because the alternative water supply also substantially reduces the significant impacts without the negative effects on efficiency and cost, the use of dry cooling is not the preferred alternative.

## ***RELATED FACILITIES ALTERNATIVES***

### **NATURAL GAS SUPPLY PIPELINE**

MVPC proposes to construct a 17-mile long pipeline to connect to the Southern California Gas (SCG) supply pipeline at Etiwanda Avenue in Rancho Cucamonga. This pipeline would run along existing road rights-of-way to the extent possible. Construction of this pipeline would cause some traffic disruption. MVPC's application includes mitigation measures designed to reduce these impacts to less than significant levels. The AFC includes analysis of three alternative pipeline routes to the same supply pipeline. All three routes connect to the SCG pipeline at the intersection of Etiwanda Avenue and Arrow Route Highway, with their preferred alternative taking the most linear route along major city streets.

The current natural gas supply to the existing plant is insufficient to supply the proposed combined cycle units. SCG supply lines in the San Bernardino area have limited additional capacity available. The SCG pipeline along Etiwanda Avenue is the closest supply line with the capacity needed for the proposed power plant. The proposed route for a connecting pipeline runs along existing city streets or will be hung from existing bridges. Because MVPC's proposed route will use existing streets or bridges limiting the impacts, staff has not considered alternative routes in this analysis.

### **RAW WATER SUPPLY**

MVPC originally proposed to use high-quality water to supply the project's water needs (MVPC 2000a, AFC page 6.14-23 to 26). MVPC also stated in the AFC its intention to investigate the possibility of using reclaimed water from the City of Redlands wastewater treatment plant. Use of large volumes of high-quality groundwater to supply the project's needs poses potentially significant impacts, including interference with neighboring wells, subsidence, and inducing the movement of contaminated groundwater into non-contaminated portions of the aquifer.

Staff has analyzed an alternative water supply consisting of a combination of reclaimed water from the City of Redlands WWTP and degraded groundwater supplemented by limited quantities of high-quality deep aquifer groundwater. Staff's analysis of this alternative water supply is presented in the **Soil and Water Resources** section of the document. Staff has found that this alternative will limit

the significant impacts. MVPC has agreed to this alternative plan for supplying the project's water needs. This alternative is preferred to the original proposal.

## **WASTEWATER DISPOSAL**

MVPC proposes to discharge wastewater through an existing 12-inch water pipeline and a proposed 1,100 foot connector to the SARI discharge line. No alternatives for the wastewater disposal were considered in this analysis.

## **TRANSMISSION LINES**

MVPC proposes to connect to the regional electric transmission grid through the adjacent SCE switchyard. No additional transmission lines and no transmission line upgrades are required to accommodate the output of the proposed facility.

### ***Guidance Pertaining to Transmission Line Siting***

Senate Bill 2431 (Garamendi, 1988) specifies that planning and siting of new transmission facilities be pursued in the following order (CEC 1992):

- The use of existing right-of-way should be encouraged by upgrading existing transmission facilities where technically and economically feasible.
- Expansion of existing right-of-way should be encouraged whenever construction of new transmission lines is required.
- New right-of-way should be created when justified by environmental, technical, or economic reasons, as determined by the appropriate licensing agency.
- Agreement among all interested utilities should be sought on efficient use of new transmission capacity whenever there is a need to construct such capacity.
- Following this guidance, no alternative transmission connections to the proposed project are feasible.

## **TECHNOLOGY ALTERNATIVES**

### **DEMAND SIDE MANAGEMENT**

One alternative to a power generation project could be programs to reduce energy consumption. These programs are typically called "energy efficiency," "conservation," or "demand side management" programs. One goal of these programs is to reduce overall electricity use; some programs also attempt to shift such energy use to off-peak periods.

The Energy Commission is responsible for several such programs, the most notable of which are energy efficiency standards for new buildings and for major appliances. The California Public Utilities Commission supervises various demand side management programs administered by the regulated utilities, and many municipal electric utilities have their own demand side management programs. The

combination of these programs constitutes the most ambitious overall approach to reducing electricity demand administered by any state in the nation.

The Energy Commission is also responsible for determining what the state's energy needs are in the future, using 5 and 12 year forecasts of both energy supply and demand. The Commission calculates the energy use reduction measures discussed above into these forecasts when determining what future electricity needs are, and how much additional generation will be necessary to satisfy the state's needs.

Having considered all of the demand side management that is "reasonably expected to occur" in its forecasts, the agency then determines how much electricity is needed. The most recent estimation of electricity needs is found in the 1996 Electricity Report.

The Warren-Alquist Act prohibits the agency, in its alternatives analysis, from considering such conservation programs to be alternatives to a proposed generation project (Pub. Resources Code, Section 25305(c)). This is because the approximate effect of such programs has already been accounted for in the agency's "integrated assessment of need," and the programs would not in themselves be sufficient to substitute for the additional generation calculated to be needed.

The Warren-Alquist Act was amended in 1999 to delete the necessity of a Commission finding of "need" in power plant licensing cases. Nevertheless, the Commission's most recent need determination, adopted in 1997, makes it abundantly clear that conservation programs alone can not displace the need for power generation for California's growing economy.

## **GENERATION TECHNOLOGY ALTERNATIVES**

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies that do not burn fossil fuels such as geothermal, solar and wind. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions.

### ***Renewable Energy Alternatives***

Solar and wind resources require large land areas in order to generate 1,056 MW of electricity. Specifically, utility scale solar thermal projects require between four and ten acres per megawatt depending on the type of system (parabolic trough, parabolic dish, or central receiver) (CEC 1996, pp. B.15.1-2). A project comparable to MVPC's proposed 1,056 MW would require more than 4,000 acres, or more than 75 times the amount of space taken by the proposed plant site. Wind generation "farms" generally require about 17 acres per megawatt, with 1,056 MW requiring more than 17,000 acres, more than 300 times the amount of space taken by the proposed plant site and linear facilities (CEC 1996, pp. B.16.1). The alternative technologies discussed above have the potential for significant land use impacts

due to the large land areas required. Consequently, staff does not believe that solar and wind technologies present feasible alternatives to the proposed project.

### ***Geothermal Resources***

Geothermal resources are available in limited areas of California. The primary geothermal resources in southern California are present in Imperial County, primarily in the Imperial Valley (CEC 2000y). Sixteen geothermal power plants with a combined online capacity of approximately 480 MW are present in Imperial County (CEC 2000z). While development of additional geothermal resources in southeastern California is possible, geothermal power is not a feasible alternative at the scale of the proposed 1,056 MW Mountainview Power Project.

### ***THE “NO PROJECT” ALTERNATIVE***

CEQA Guidelines and Energy Commission regulations require consideration of the “no project” alternative. This alternative assumes that the project is not constructed, and is compared to the proposed project. A determination is made whether the “no project” alternative is superior, equivalent, or inferior to the proposed project.

In the AFC, MVPC evaluated the “no project” alternative and determined that it would make less efficient use of the region’s infrastructure and energy resources (MVPC 2000a, AFC page 5-1). Without construction of the new units, the existing MVPC would operate the existing power plant at times of peak demand. Electricity demand, which is expected to grow in Southern California in general and in San Bernardino and Riverside Counties in particular, would be met either by increased use of existing facilities or the development of other new power plants.

Staff views the “no project” alternative as feasible. If this project is not built, the same market conditions that encouraged it to be proposed will encourage other similar projects. It is quite feasible that a substantial amount of additional generating capacity will be proposed even in the absence of this project. Staff can reasonably expect California’s need for new plants to be filled with or without the proposed project. There is no reason to assume that the total amount of capacity actually built would differ with or without this project.

It follows then, that the extent to which nuclear and older fossil generation resources will be replaced by new resources can be expected to be the same with or without this project. The extent to which generation from existing power plants would consume fuel and emit pollutants would be the same with or without this project. And whatever effect new plants might have insulating ratepayers and taxpayers from risk will occur whether or not the proposed plant is included among the new plants actually built.

The “no project” alternative would eliminate the expected economic benefits which the proposed project would bring to City of Redlands and San Bernardino County. These include estimated property tax revenues of approximately \$5 million per year to be split between the city, county, and various local districts (MVPC 2000g, AFC Supplement pages 6.7-14 to 6.7-14d). Construction equipment and materials purchases are estimated to be between \$250 million and \$290 million, with

approximately \$20 million in sales tax revenues generated for the City of Blythe and Riverside County. MVPC estimates an operations payroll starting at approximately \$2 million per year for the first year of operation (MVPC 2000a, AFC page 6.7-13). Staff has determined that the “no project” alternative is environmentally superior to the project as originally proposed. This is because the original proposal would have had significant environmental impacts on water resources. Not constructing and operating an (unmitigated) power plant would avoid these impacts. However, as stated above, staff believes that use of the alternative sources of water described above will reduce any impacts to less than significant levels. In addition, staff recognizes potential economic benefits will be derived from the project. Therefore, staff believes that, overall, the “no project” alternative is not the preferred alternative.

## **CONCLUSIONS REGARDING ALTERNATIVES**

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Staff has analyzed in detail alternatives to the project design and related facilities, alternative technologies, and the “no project” alternative. Staff did not analyze in detail alternative sites for the project. Staff determined that developing the project at an alternative site would not allow MVPC to make use of infrastructure at the existing site, one of the objectives of the project, and would not substantially lessen the significant impacts of the project identified in the staff’s assessment.

Staff has determined that the preferable alternative is the proposed project using alternative water supplies. Since the AFC was accepted, MVPC has agreed to use reclaimed water and degraded groundwater from the middle aquifer as the main sources of water. Staff does not believe that energy efficiency measures and alternative technologies (geothermal, solar, wind, and hydroelectric) present any feasible alternatives to the proposed project.

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# **GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN**

Prepared by Bob Eller

## **INTRODUCTION**

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The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

General conditions that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
- establish requirements for facility closure plans.
- Specific conditions of certification:
  - Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

## **GENERAL CONDITIONS OF CERTIFICATION**

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### **COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES**

A CPM will oversee the compliance monitoring and shall be responsible for:

- ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
- resolving complaints;
- processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
- documenting and tracking compliance filings; and,
- ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

### ***PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING***

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

### ***ENERGY COMMISSION RECORD***

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

- all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- all monthly and annual compliance reports filed by the project owner;
- all complaints of noncompliance filed with the Energy Commission; and,

- all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

## **PROJECT OWNER RESPONSIBILITIES**

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

## **ACCESS**

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

## **COMPLIANCE RECORD**

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all "as-built" drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

## **COMPLIANCE VERIFICATIONS**

Each condition of certification is followed by a means of "verification". The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

- reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
- appropriate letters from delegate agencies verifying compliance;

- Energy Commission staff audits of project records; and/or
- Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Compliance Project Manager  
California Energy Commission  
1516 Ninth Street (MS-2000)  
Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

## ***COMPLIANCE REPORTING***

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

## **COMPLIANCE MATRIX**

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to

provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

- the technical area,
- the condition number,
- a brief description of the verification action or submittal required by the condition,
- the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
- the expected or actual submittal date,
- the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable, and
- the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

#### **PRE-CONSTRUCTION MATRIX**

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

#### **TASKS PRIOR TO START OF CONSTRUCTION**

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

## MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

- a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
- documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
- an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
- a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
- a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
- a cumulative listing of any approved changes to conditions of certification;
- a listing of any filings with, or permits issued by, other governmental agencies during the month;
- a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
- a listing of the month's additions to the on-site compliance file; and
- any requests to dispose of items that are required to be maintained in the project owner's compliance file.
- a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

## **ANNUAL COMPLIANCE REPORT**

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

- an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
- a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
- documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
- a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
- an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
- a listing of filings made to, or permits issued by, other governmental agencies during the year;
- a projection of project compliance activities scheduled during the next year;
- a listing of the year's additions to the on-site compliance file, and
- an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
- a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

## ***CONFIDENTIAL INFORMATION***

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

## ***DEPARTMENT OF FISH AND GAME FILING FEE***

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars (\$850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department

of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

### ***REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS***

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on the following page.

## COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: AFC Number:
<b>COMPLAINT LOG NUMBER</b> _____ Complainant's name and address:   Phone number:
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):   
Findings of investigation by plant personnel:    Indicate if complaint relates to violation of a CEC requirement: Date complainant contacted to discuss findings:
Description of corrective measures taken or other complaint resolution:       Indicate if complainant agrees with proposed resolution: If not, explain:    Other relevant information:
If corrective action necessary, date completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date: _____

(Attach additional pages and supporting documentation, as required.)

## **FACILITY CLOSURE**

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At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

### **PLANNED CLOSURE**

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

### **UNEXPECTED TEMPORARY CLOSURE**

An unplanned unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

### **UNEXPECTED PERMANENT CLOSURE**

An unplanned unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

## **GENERAL CONDITIONS FOR FACILITY CLOSURE**

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### **PLANNED CLOSURE**

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the

CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission. The plan shall:

- identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.
- identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
- identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
- address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

## **UNEXPECTED TEMPORARY CLOSURE**

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the

Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

## **UNEXPECTED PERMANENT CLOSURE**

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

## **DELEGATE AGENCIES**

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To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion, as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

## **ENFORCEMENT**

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The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforeseeable events, and other factors the Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

## **NONCOMPLIANCE COMPLAINT PROCEDURES**

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Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

## **INFORMAL DISPUTE RESOLUTION PROCEDURE**

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

### ***REQUEST FOR INFORMAL INVESTIGATION***

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

### ***REQUEST FOR INFORMAL MEETING***

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

- immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
- secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;
- conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,
- after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

## **FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS**

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

## **POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES**

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The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

## **AMENDMENT**

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

## **INSIGNIFICANT PROJECT CHANGE**

The proposed change will be processed as an insignificant project change if it does not require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

## **VERIFICATION CHANGE**

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

## KEY EVENT LIST

PROJECT \_\_\_\_\_ DATE ENTERED \_\_\_\_\_

DOCKET # \_\_\_\_\_ PROJECT MANAGER \_\_\_\_\_

<b><i>EVENT DESCRIPTION</i></b>	<b><i>DATE ASSIGNED</i></b>
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1st Turbine Roll)	
Start of Rainy Season	
End of Rainy Season	
Start T/L Construction	
Complete T/L Construction	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
Start Rough Grading	
Complete Rough Grading	
Start of Water Supply Line Construction	
Completion of Water Supply Line Construction	
Start Implementation of Erosion Control Measures	
Complete Implementation of Erosion Control Measures	



## PREPARATION TEAM

Executive Summary.....	James Reede
Introduction.....	James Reede
Project Description .....	James Reede
Air Quality .....	Joseph M. Loyer
Public Health .....	Obed Odoemelum
Worker Safety and Fire Protection.....	Rick Tyler
Transmission Line Safety and Nuisance .....	Obed Odoemelum
Hazardous Materials.....	Rick Tyler
Waste Management .....	Obed Odoemelum
Land Use .....	Michael E. Berman
Traffic and Transportation .....	Ron Foster
Noise .....	Thomas M. Murphy
Visual Resources.....	Michael Clayton, Eric Knight
Cultural Resources .....	Jeanette A. McKenna, Dorothy Torres
Socioeconomics .....	Jon Davidson
Biology.....	Dr. Jeff Kaufmann, Natasha Nelson, Rick York
Water and Soils .....	Lind Bond, Joe Crea, James C. Henneforth, Lorraine White
Paleontological Resources .....	Robert Anderson
Facility Design .....	Steve Baker/Al McCuen/M. Kisabuli
Reliability .....	Steve Baker
Efficiency .....	Steve Baker
Transmission System Engineering .....	Mark Hesters, Al McCuen

Alternatives ..... Kevin Kennedy, Ph.D.  
Compliance Monitoring Plan and General Conditions..... Bob Eller  
Project Secretary.....Luz Angelica Manriquez  
Support Staff ..... Chester Hong, Pat Owen, Mary Dyas

## DECLARATIONS AND RESUMES