Preliminary Staff Assessment

METCALF ENERGY CENTER

Application For Certification 99-AFC-3
Santa Clara County

CALIFORNIA ENERGY COMMISSION

STAFF REPORT

MAY 2000
(99-AFC-3)

Gray Davis, *Governor*

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EXECUTIVE SUMMARY

On April 30, 1999, the Calpine Corporation and Bechtel Enterprises, Inc. filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Metcalf Energy Center (MEC), a 600 megawatt (MW), natural gas-fired, combined cycle power plant. On June 23, 1999, the California Energy Commission found the AFC to be data adequate. On October 1, and October 15, 1999, and February 15, 2000, Calpine/Bechtel filed supplements A, B and C to their application altering their original proposal in response to input from the public and the City of San Jose.

As proposed, the site is located partially in the City of San Jose and the County of Santa Clara near Highway 101 in the south part of San Jose (see **PROJECT DESCRIPTION Figure 1**). The site lies at the southern base of Tulare Hill in northern Coyote Valley to the west of Monterey Highway and south of the Metcalf Road intersection. The 14-acre site is currently zoned for agricultural uses.

The Metcalf Energy Center and related facilities such as the electric transmission lines, natural gas line, water supply lines and wastewater lines are under the Energy Commission jurisdiction (Pub. 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 Bay Area 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 Preliminary Staff Assessment (PSA) and, after workshops on this draft document, a Final Staff Assessment (FSA) will be completed. The FSA 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 MEC proceedings, will consider and weigh the recommendations of all interested parties, including Energy Commission staff, the applicant, intervenors, public, City of San Jose, and other local, state and federal agencies, before making the final decision. The analyses contained in this document were prepared in accordance with PRC Sections 25500 et seq.; the California Code of Regulations (CCR) Title 20, Sections 12001 et seq.; and the California Environmental Quality Act (PRC §§ 21000 et seq.) and its guidelines (CCR title 14 §§ 15000 et seq.).

PROJECT DESCRIPTION

Calpine/Bechtel's proposed power plant design consists of two combustion turbine generators (CTG) capable of generating a maximum of 200 MW, equipped with steam injection power augmentation capabilities; two heat recovery steam turbine generators (HRSG) with duct burners; a single condensing steam turbine generator capable of generating a maximum of 235 MW; a mechanical draft (wet/dry) plume-abated cooling tower; and a 230-kilovolt (kV) switching station.

The combustion turbine trains will include 145-foot exhaust stacks at the southern end of the site and step-up transformers, heat recovery steam generator (HRSG) units with 80-foot exhaust stacks, steam turbine generator units and their transformers, and water treatment and cooling towers.

Nitrogen oxide (NO_x) emissions from the combustion process will be controlled to 2.5 parts-per-million by volume dry (ppmvd) corrected to 15 percent oxygen by utilizing dry low NO_x combustion technology in the CTGs and a selective catalytic reduction (SCR) system for the HRSGs. The SCR system will use aqueous ammonia for the reduction process.

Additional facilities proposed as part of this project include an administration building with control room, storage tanks, parking area, water treatment building, a switchgear building and a warehouse/maintenance shop. Calpine/Bechtel may also install a temporary rail spur from the adjacent Union Pacific Railroad to accommodate delivery of heavy equipment during construction.

The proposed power plant is adjacent to existing PG&E transmission lines that are connected to the Metcalf Substation. Electricity generated by MEC will be delivered to the transmission grid via a new 230-kV transmission line approximately 200 feet in length. The overhead transmission line will connect into PG&E's existing 230-kV Metcalf-Monte Vista No. 4 line which runs east-west along the northern edge of the project boundary.

Calpine/Bechtel proposes to use approximately 2.9 to 5.8 million gallons a day of recycled water for cooling purposes from the San Jose/Santa Clara Water Pollution Control Plant as part of the South Bay Water Recycling Program. This will necessitate the construction of a new 10.2-mile recycled water supply line (the "SWBR Route"). A combined industrial wastewater and sanitary sewer line (less than a mile in length) will be constructed along Fisher Creek to the City's existing sanitary sewer line that runs along Santa Teresa Boulevard. Back-up water will be supplied either by the San Jose Municipal Water System or from wells located on site or one mile south of the project. Domestic water supply pipelines include a 1.25-mile, 24-inch pipeline along the western portion of the railroad right-of-way from the MEC to San Jose MUNI Well 23 near Bailey Road and a pipeline from the MEC site to Great Oaks Water Company's system located in Santa Teresa Boulevard.

During baseload operations, it is expected that the project will use a maximum of 99,000 MMBtus/day of natural gas. The applicant proposes to build a new 16-inch diameter fuel gas pipeline from the MEC to PG&E's existing Line 300, a major natural gas transmission line along the eastern side of US 101. The proposed gas pipeline is sized to permit operation of the turbines and duct burners at full power.

Calpine/Bechtel estimates the capital costs of the Metcalf Energy Center to be $300-$400 million. The applicant expects to employ a peak construction workforce of about 400 over a two-year period and a permanent workforce of 20 for plant operation. Construction payroll is estimated to be about $40.8 million, while annual operations payroll is expected to be $1 million.

If approved, construction of the MEC, from site preparation to commercial operation is expected to take approximately 18 months. The applicant anticipates commercial operation by the summer of 2002.

PUBLIC AND AGENCY COORDINATION

The Metcalf Energy Center is proposed on land currently zoned for agricultural uses. Consequently, Calpine/Bechtel has applied to the City of San Jose for a change in the general plan and zoning designation. For the City of San Jose to make a determination to change the general plan and zoning, an environmental document is required. The City of San Jose has agreed to use the Energy Commission's FSA as their environmental document on which to base their decision. As such, the analysis has been closely coordinated with the City of San Jose staff.

Publicly noticed workshops on air quality, water resources, biological resources, project site alternatives, and transmission system engineering were held in San Jose prior to the completion of the PSA. Several of these workshops were jointly sponsored by the Energy Commission staff and the City of San Jose District 2 Metcalf Energy Center Advisory Committee. These workshops were highly productive and well attended.

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 San Jose, California Independent System Operator (Cal-ISO), Bay Area 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 the many interested residents of the community.

A series of publicly noticed workshops will be conducted on this document during June. Information gathered during these workshops will be used to complete the FSA. Additionally, written comments on the PSA will be included in the FSA. Energy Commission staff will address public comments in the FSA.

DRAFT CONCLUSIONS AND RECOMMENDATIONS

The PSA is a draft document of the Energy Commission staff so, by its very nature, the conclusions and recommendations presented are draft and may change in the FSA.

Each technical area assessment in the PSA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS) and 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, if it is approved.

In summary:

The project is in conformance with all Laws, Ordinances, Regulations and Standards (LORS) with the exception of land use, visual resources, noise and surface hydrology:

- since the proposed site is zoned for agricultural uses, Calpine/Bechtel has applied for a general plan amendment, rezoning of the land and annexation to the City of San Jose. This request is currently being reviewed by the City of San Jose (see the chapter on Land Use for a full discussion);
- the proposed MEC would be inconsistent with several applicable land use laws, ordinances, regulations and standards.(LORS) (see the chapter on Land Use for a full discussion);
- the applicant has proposed to design the project to achieve a noise level of 49 dBA at the nearest residence; however, this is not consistent with staff's policy of 44 dBA to achieve a level not more than 5 dBA above the nighttime ambient; (see the chapter on Noise for a full discussion);
- the applicant has not demonstrated compliance with LORS for surface hydrology with respect to flooding and drainage (see the chapter on Geology and Paleontology for a full discussion);

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 except for land use, soil and water resources, visual resources and possibly biological resources:

- Land Use - the project will have a significant and unmitigable adverse impact on agriculture because it would convert more than 10 acres of Prime Farmland to non-agricultural use, and the project will be incompatible with existing and planned land uses due to the significant and unmitigable visual and potential noise impacts (see the chapter on Land Use for a full discussion).
- Soil and Water Resources - The project has the potential for significant, unmitigated impacts, specifically to the recycled water quality of the South Bay

Water Recycling program and to Coyote Valley Basin groundwater resources (see the chapter on Soil and Water Resources for a full discussion).

- Visual Resources – Adverse visual impacts are determined to be significant and unmitigable for views from the Blanchard Road area, northbound passenger trains, southbound Monterey Road and the railroad, and the future trail corridor at Fisher Creek (see the chapter on Visual Resources for a full discussion).
- Biological Resources - The project will potentially have significant and unmitigable impacts for biology where the issue of mitigation for the federally listed bay checkerspot butterfly is unresolved (see the chapter on Biological Resources for a full discussion).

The analyses contained in the Preliminary Determination of Compliance issued by the San Francisco Bay Area Air Quality Management District have been incorporated into the PSA;

The San Francisco Bay Area 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 San Francisco Bay Area Air Quality Management District;

Energy Commission staff have identified a number of air quality issues beyond those addressed by the San Francisco Bay Area Air Quality Management District that need to be resolved before staff can reach conclusions and develop conditions of certification (see the chapter on Air Quality for a full discussion);

Several alternatives are environmentally preferable to the proposed project. These include the “No Project” alternative, a power plant with a smaller generating capacity, and staff’s alternative sites Alt-1, Alt-2, Alt-3, and Alt-4. (see the chapter on Alternatives for a full discussion).

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INTRODUCTION

On April 30, 1999, the Calpine Corporation and Bechtel Enterprises, Inc. filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Metcalf Energy Center (MEC), a 600 megawatt (MW), natural gas-fired, combined cycle power plant. On June 23, 1999, 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.

On October 1, and October 15, 1999, Calpine/Bechtel filed supplements A and B to their application, altering their original proposal. More recently, on February 15, 2000, Calpine/Bechtel filed supplement C that contains some additional changes to the project in response to input from the public and the City of San Jose.

The Preliminary Staff Assessment (PSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of Calpine Corporation and Bechtel Enterprise's (Calpine/Bechtel) Application for Certification (AFC) for the Metcalf Energy Center (MEC). The air quality chapter incorporates the Bay Area Air Quality Management District's preliminary Determination of Compliance with rules and regulations of the District. The PSA is prepared pursuant to Title 20, California Code of Regulations, sections 1742, 1742.5, 1743 and 1744. The PSA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision.

ORGANIZATION OF THE REPORT

The PSA 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 and operated, if it is certified; and
- project alternatives.

The analyses contained in this PSA 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 PSA presents conclusions and proposed conditions of certification that would apply to the design, construction, operation and closure of the proposed facility.

The PSA contains an Executive Summary, Introduction, Project Description, Project Alternatives and staff recommendation on Need Conformance. 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, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, water resources, geology (including geologic hazards, surface water hydrology, paleontological resources, geological resources); facility design, power plant reliability, power plant efficiency and transmission system engineering. These chapters are followed by 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

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 (Pub. Resources Code, section 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 (Pub. Resources Code, section 25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, section 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, sections 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, section 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, section 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 (Public Resource Code, section 21080.5 and Cal. Code Regs. tit. 14, section 15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other portions of CEQA.

The staff normally prepares both a preliminary and final staff assessment. The PSA presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's preliminary analysis, conclusions, and recommendations. Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and the Final Staff Assessment (FSA), staff will conduct a series of workshops in San Jose to discuss their 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 PSA will be included in the FSA. The FSA 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 a specific 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 FSA 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 PSA.

PUBLIC AND AGENCY COORDINATION

The Metcalf Energy Center is proposed on land not currently zoned for a power plant. Consequently, Calpine/Bechtel has applied to the City of San Jose for a change in the general plan, zoning designation and annexation to the City of San Jose. For the City of San Jose to make a determination to change the general plan and zoning, an environmental document is required. The City of San Jose has agreed to use the Energy Commission's FSA as their environmental document on which to base their decision. As such, the analysis has been closely coordinated with the City of San Jose.

Publicly noticed workshops on air quality, water resources, biological resources, project site alternatives, and transmission system engineering have been held in San Jose. Several of these workshops were jointly sponsored by the Energy Commission staff and the City of San Jose District 2 Metcalf Energy Center Advisory Committee. These workshops have been highly productive and well attended by the public.

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 San Jose, California Independent System Operator (Cal-ISO), Bay Area Air Quality Management District, California Air Resources Board, 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

Calpine Corporation and Bechtel Enterprises, Inc., a partnership, is seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Metcalf Energy Center (MEC), a 600 megawatt (MW), natural gas-fired, combined cycle power plant.

Calpine/Bechtel estimates the capital costs of the Metcalf Energy Center to be $300-$400 million. The applicant expects to employ a peak construction workforce of about 400 over a two-year period and a permanent workforce of 20 for plant operation. Construction payroll costs are estimated to be $40.8 million, while annual operations payroll is expected to be $1 million.

If approved, construction of the MEC, from site preparation to commercial operation is expected to take approximately 18 months. The applicant anticipates commercial operation by the summer of 2002.

Calpine/Bechtel is developing the MEC to sell electricity in California's electricity market. Calpine/Bechtel will bear all project economic risks. Overall anticipated availability for the MEC is between 92 and 98 percent, operating approximately seven days a week, 24 hours a day. The proposed project is a merchant facility, not owned by a utility or its affiliate.

PROJECT LOCATION

As proposed by Calpine/Bechtel., the MEC site is located partially in the City of San Jose and the County of Santa Clara (see **PROJECT DESCRIPTION Figure 1**). The site lies at the southern base of Tulare Hill in northern Coyote Valley to the west of Monterey Highway and south of the Metcalf Road intersection. The site is bordered by Fisher Creek to the north and west and the Union Pacific Railroad right-of-way to the east. Blanchard Road is to the south.

The applicant proposes to construct the 600-megawatt, combined cycle, power plant on 14 acres (10 acres lies in the County of Santa Clara and 4 acres in the City of San Jose). During the construction phase, Calpine/Bechtel also proposes a temporary 20-acre construction laydown area adjacent to and south of the proposed power plant site. The site is currently zoned for agricultural uses.

PROJECT DESCRIPTION AND LINEAR FACILITIES

Calpine/Bechtel's proposed power plant design consists of two combustion turbine generators (CTG) capable of generating a maximum of 200 MW, equipped with steam injection power augmentation capabilities; two heat recovery steam turbine generators (HRSG) with duct burners; a single condensing steam turbine generator capable of generating a maximum of 235 MW; a mechanical draft (wet/dry) plume-abated cooling tower; and a 230-kilovolt (kV) switching station. Natural gas is burned in the combustion turbine generators, which converts the thermal energy into mechanical energy required to drive the compressor and electric generator.

An associated 900-foot 2-lane road will allow access to the site from Monterey Highway. Please see the **FACILITY DESIGN** section for a more detailed description.

The two combustion turbine trains will include heat recovery steam generator (HRSG) units with 145-foot exhaust stacks, a steam turbine generator unit and step-up transformers, and water treatment and cooling towers. Calpine/Bechtel proposes to locate the hybrid wet/dry cooling towers at the west end of the site and equip them with a plume abatement system to minimize the plume.

Nitrogen oxide (NO_x) emissions from the combustion process will be controlled to 2.5 parts-per-million by volume dry (ppmvd) corrected to 15 percent oxygen by utilizing dry low NO_x combustion technology in the CTGs and a selective catalytic reduction (SCR) system for the HRSGs. The SCR system will use aqueous ammonia for the reduction process.

Additional facilities proposed as part of this project include an administration building with control room, storage tanks, parking area, water treatment building, a switchgear building and a warehouse/maintenance shop. Calpine/Bechtel may also install a temporary rail spur from the adjacent Union Pacific Railroad to accommodate delivery of heavy equipment during construction.

The linear facilities (electric transmission lines, natural gas line, and water supply lines) are described below and are depicted on the **PROJECT DESCRIPTION Figure 2 Local Setting** map.

ELECTRIC TRANSMISSION LINES

The proposed power plant is adjacent to existing PG&E transmission lines that are connected to the Metcalf Substation. Electricity generated by MEC will be delivered to the transmission grid via a new 230 kV transmission line approximately 200 feet in length. The overhead transmission line will connect into PG&E's existing 230 kV Metcalf-Monte Vista No. 4 line which runs east-west along the northern edge of the project boundary.

WATER SUPPLY

As described in their October 1, 1999 AFC supplement, Calpine/Bechtel proposes to use approximately 2.9 to 5.8 million gallons a day of recycled water for cooling purposes from the San Jose/Santa Clara Water Pollution Control Plant as part of the South Bay Water Recycling Program. This will necessitate the construction of a new 10.2-mile recycled water supply line (the "SBWR Route"). A combined industrial wastewater and sanitary sewer line (less than a mile in length) will be constructed along Fisher Creek to the City's existing sanitary sewer line that runs along Santa Teresa Boulevard. Back-up water will be supplied either by the San Jose Municipal Water System or from wells located on site or one mile south of the project. Domestic water supply pipelines include a 1.25-mile, 24-inch pipeline along the western portion of the railroad right-of-way from the MEC to San Jose MUNI Well 23 near Bailey Road and a pipeline from the MEC site to Great Oaks Water Company's system located in Santa Teresa Boulevard.

NATURAL GAS PIPELINE

During baseload operations, it is expected that the project will use a maximum of 99,000 MMBtus/day of natural gas. The applicant proposes to build a new 16-inch diameter fuel gas pipeline from the MEC to PG&E's existing Line 300, a major natural gas transmission line along the eastern side of US 101. The proposed gas pipeline is sized to permit operation of the turbines and duct burners at full power.

Project Description Figure 1
Regional Setting

Project Description Figure 2
Local Setting

Project Description Figure 3
Visual Simulation

NEED CONFORMANCE

Statement of Kerry Willis, Staff Counsel

The Metcalf Energy Center Application for Certification was accepted on June 23, 1999. Prior to January 1, 2000, the Public Resources Code prohibited the Energy Commission from certifying a power plant unless the Commission made a finding that the facility was found to be in conformance with the Commission's integrated assessment of the need for new resource additions. (Pub. Resources Code §§ 25523(f) and 25524(a).) The Public Resources Code directed the Commission to do an "integrated assessment of need," taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

On September 28, 1999, the Governor signed Senate Bill No. 110, which became Chapter 581, Statutes of 1999. This legislation repealed Public Resources Code sections 25523(f) and 25524(a) and amended other provisions relating to the assessment of need for new resources. It removed the requirement that the Commission make a specific finding that the proposed facility is in conformance with the adopted integrated assessment of need. Regarding need-determination, Senate Bill 110 states:

> "Before the California electricity industry was restructured the regulated cost recovery framework for power plants justified requiring the commission to determine the need for new generation, and site only power plants for which need was established. Now that power plant owners are at risk to recover their investments, it is no longer appropriate to make this determination."

(Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.) Senate Bill 110 takes effect on January 1, 2000 (Cal. Const. Art. 4, § 8.). As of January 1, 2000, the Commission is no longer required to determine if a proposed project conforms with an integrated assessment of need. As a result, an application for certification for which the Commission adopts a final decision after January 1, 2000 is not subject to a finding of "need-conformance."

In this case, the Commission's final decision will be made after January 1, 2000. Therefore, because of SB 110, the Commission will make no finding of "need-conformance" with respect to the proposed project.

AIR QUALITY

Magdy Badr

INTRODUCTION

This analysis addresses the potential air quality impacts resulting from criteria air pollutant emissions created by the construction and operation of the Metcalf Energy Center project. Criteria air pollutants are those for which a state or federal standard has been established. They include nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3) and its precursors (nitrogen oxides (NO_x) and volatile organic compounds (VOC)), and particulate matter less than 10 and 2.5 microns in diameter (PM10 and PM2.5) and their precursors: NO_x, VOC, and SO_x.

In carrying out its analysis, the California Energy Commission staff evaluates the following points:

- whether the Metcalf Energy Center project is likely to conform with applicable Federal, State, and Bay Area Air Quality Management District (BAAQMD) air quality laws, regulations and standards, as required by Title 20, California Code of Regulations, sections 1744(b) and 1744.5 (b),
- whether the Metcalf Energy Center 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, sections 1742(b) and 1742.5 (b) , and
- whether the mitigation proposed for the Metcalf Energy Center is adequate to lessen the potential impacts to a level of less than significant, as required by Title 20, California Code of Regulations, section 1742(b), and 1742.5(a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal Clean Air Act requires any new major stationary sources of air pollution and any major modifications to major stationary sources to obtain an air pollution permit before commencing construction. This process is known as New Source Review (NSR). Its requirements differ depending on the attainment status of the area where the major facility is to be located. Prevention of Significant Deterioration (PSD) requirements apply in areas that are in attainment of the national ambient air quality standards. The Non-attainment area NSR requirements apply to areas that have not been able to demonstrate compliance with national ambient air quality standards. The entire program, including both PSD and Non-attainment NSR permit reviews, is referred to as the federal NSR program.

Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with the requirements included in the Code of Federal Regulations 40, part 70. A Title V

permit contains all of the requirements specified in different air quality regulations which affect an individual project.

The U.S. Environmental Protection Agency (EPA) has reviewed and approved the Bay Area Air Quality Management District's (BAAQMD) regulations and has delegated to the BAAQMD the implementation of the federal PSD, Non-attainment NSR, and Title V programs. The BAAQMD implements these programs through its own rules and regulations, which are, at a minimum, as stringent as the federal regulations.

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 causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, response, health, or safety of any such person or the public, or which causes, or have a natural tendency to cause, injury or damage to business or property."

The state's Air Resources Board (ARB) promulgates state-level ambient air quality standards, which are, in general, more stringent than the national ambient air quality standards. Table 5.2-2 in the Application for Certification (AFC) presents a summary of the current national and state ambient air quality standards.

LOCAL

The proposed facility is subject to various BAAQMD rules and regulations. Regulation 2, Rule 2 is the more relevant local air quality rule for this project. This rule, entitled "New Source Review," applies to all new and modified stationary sources. It defines requirements related to Best Available Control Technology (BACT), offsets, emission calculation procedures to estimate bankable emission reduction credits (ERCs), and requirements for the federal acid rain program.

A more complete discussion of the applicable rules and regulations can be found in section 8.1, regulatory setting of the AFC and data responses. An in-depth discussion how the Metcalf Energy Center will comply with all applicable rules and regulations is provided in the BAAQMD's Final Determination of Compliance (FDOC).

SETTING

METEOROLOGY AND CLIMATE

A presentation of the meteorological and climatological characteristics of the region can be found in section 8.1 of the AFC. In addition, the BAAQMD has published an excellent discussion on this subject, entitled "Climate, Physiography, and Air Pollution Potential - Bay Area and its Subregions" (BAAQMD, 1999).

The Metcalf Energy Center, if approved, would be located in a climatological subregion of the Bay Area known as the Santa Clara Valley. It is located eleven miles southeast of downtown San Jose and approximately eight miles northwest of the town of Morgan Hills. The project site is relatively flat bounded by Santa Teresa Hills on the southwest and other ridges of the Coastal Range to the northeast.

The project area is characterized by prevailing winds predominantly from the northwest which associated with the flow of the cool marine air inland to the warm interior during the warm part of the day and warm part of the year. These wind directions will provide a favorable conditions for the dispersion of pollutants during the summer and fall seasons.

However, during the cool parts of the year and sometimes during parts of the day, when temperatures over the Bay are warmer than inland, convective flow of southeasterly winds occur. These wind conditions will inhibit low-lying sources of pollution which can result in high concentrations of pollution during the winter and spring seasons. Calm conditions occur one percent of the time. Summer temperature ranges from average mid-50s to high 80s. In winter, the average lows are in the 40s and the average highs are in the 50s. These data are obtained from the meteorological monitoring station in south San Jose operated by IBM.

EXISTING AMBIENT AIR QUALITY

Both the EPA and the ARB have established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for the levels of all criteria pollutants which are designed to protect the most sensitive members of the population such as children, elderly and people with lung or heart diseases. AIR QUALITY Table 1 summarizes these standards. In general, when these NAAQS are exceeded more than once a year for one of the criteria pollutant, the area will be designated as nonattainment for that pollutant. For example, the Bay area air quality basin is classified as nonattainment for ozone. Therefore, the BAAQMD will be obligated in their Air Quality Management Plan to require and enforce more stringent control requirements to reduce ozone in the air basin.

AIR QUALITY Table 2 summarizes the Ambient Air Quality Monitoring data recorded at the San Jose-4th street monitoring station for ozone, PM10 NO_2 and CO from 1993 to 1998. The table provides the concentration of each pollutant, the averaging time over which the concentration is measured and the number of days of the year which the CAAQS or NAAQS is violated. In 1998 the EPA reclassified the Bay Area as nonattainment for ozone based on violations of the federal standards at several locations in the air basin.

AIR QUALITY Table 1

Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O3)	1 Hour	0.12 ppm	0.09 ppm
	8 Hours	0.08 ppm	---
Carbon Monoxide (CO)	8 Hour	9.0 ppm	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO2)	Annual Average	0.053 ppm (100 μg/m^3)	---
	1 Hour	---	0.25 ppm (470 μg/m^3)
Sulfur Dioxide (SO2)	Annual Average	80 μg/m^3 (0.03 ppm)	---
	24 Hour	365 μg/m^3 (0.14 ppm)	0.04 ppm (105 μg/m^3)
	3 Hour	1300 μg/m^3 (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 μg/m^3)
Suspended Particulate Matter (PM10)	Annual Geometric Mean	---	30 μg/m^3
	24 Hour	150 μg/m^3	50μg/m^3
	Annual Arithmetic Mean	50 μg/m^3	---
Sulfates (SO_4)	24 Hour	---	25 μg/m^3
Lead	30 Day Average	---	1.5 μg/m^3
	Calendar Quarter	1.5 μg/m^3	---
Hydrogen Sulfide (H_2S)	1 Hour	---	0.03 ppm (42μg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 μg/m^3)
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

AIR QUALITY Table 2
San Jose - 4TH St Ambient Air Quality Monitoring Data

Pollutant		1993	1994	1995	1996	1997	1998	Most Restrictive Ambient Air Quality Standard
Ozone	Highest 1-hr conc. (ppm)	0.11	0.11	0.13	0.11	0.094	0.15	0.09(CAAQS) 0.12(NAAQS)
	# of days with violations of CAAQS	3	2	14	5	0	4	---
PM10	Highest 24-hr conc. ($\mu g/m^3$)	92	92.6	59.7	76.1	78	92	50.0 (CAAQS)
	# of days with violations of CAAQS	8	7	4	2	3	3	---
	Highest annual conc. ($\mu g/m^3$)	NA	NA	21.91	22.08	23.73	22.48	30 (CAAQS)
NO_2	Highest 1-hr conc. (ppm)	0.12	0.107	0.116	0.108	0.108	0.083	0.25 (CAAQS)
	Highest annual conc. ($\mu g/m^3$)	0.027	0.028	0.027	0.025	0.025	0.025	0.053 (CAAQS)
CO	Highest 1-hr conc. (ppm)	14	12	8.9	8.8	9.9	8.6	20.0 (CAAQS)
	Highest 8-hr conc. (ppm)	6.88	8.75	5.84	7	6.11	6.27	9.0 (CAAQS)
SO_2	Highest 1-hr conc. (ppm)	NA	NA	NA	NA	NA	NA	0.05 (CAAQS)
	Annual Avg. (ppm)	NA	NA	NA	NA	NA	NA	0.003

NA: Data are Not Available.
Source: CARB. 1993-1998 "Air Quality CD-ROM

OZONE

In the presence of the ultraviolet radiation, both NOx and VOC go through a number of complex chemical reactions to form ozone. AIR QUALITY Table 3 summarizes the best representative ambient air quality data collected from three different monitoring stations close to the project site. The table shows that, generally, the ozone formation is high in the summer time and low in the winter time. The San Francisco air basin is classified as nonattainment area for ozone because it violates California Ambient Air Quality Standards (CAAQS) and recently, as discussed above, the National Ambient Air Quality Standards (NAAQS). The table also shows the maximum hourly concentration and the number of days above the State standards.

AIR QUALITY Table 3
Ozone Air Quality Summary, 1991-1996

Year	4th Street			Piedmont St			W San Carlos		
	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations Occurred
1991	0.1	6	Jl, S,O	NA	NA	NA	0.08	0	0
1992	0.12	3	Jl, S	0.13	5	S, O	0.11	1	S
1993	0.11	3	Ju, Jl, S	0.11	5	Ju, Jl, Au, S	0.13	4	Ju, Jl, Au, S
1994	0.11	2	Ju, Au	0.12	3	Ju, Au, S	0.098	1	Au
1995	0.13	14	Ju, Jl, Au	0.15	15	Ju, Jl, Au, S	0.047	0	0
1996	0.11	5	Ap, My, Ju, S	0.12	5	My, Ju, Jl	NA	NA	NA
1997	0.094	0	0	0.095	1	S	NA	NA	NA
1998	0.15	4	Jl, Au, S	0.13	5	Jl, Au, S	NA	NA	NA

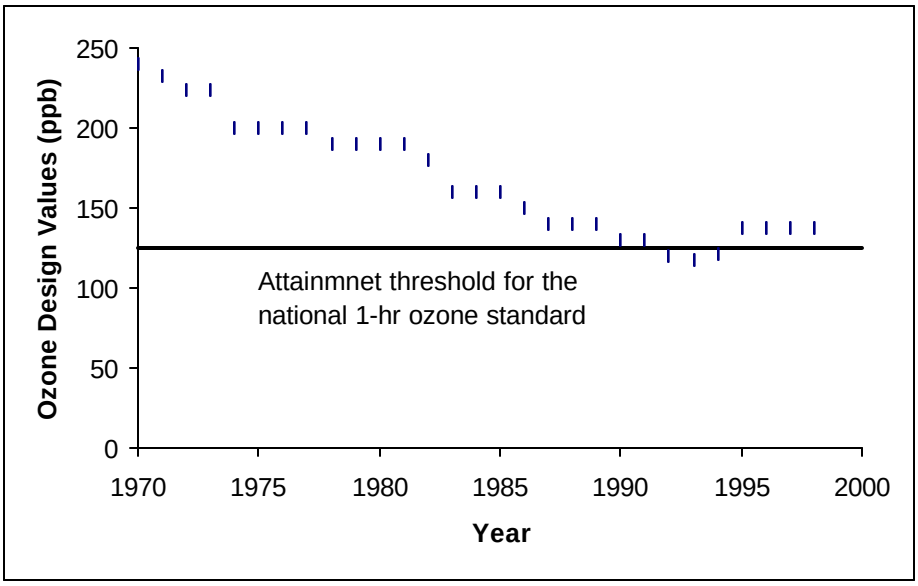
California Ambient Air Quality Standard: 0.09 ppm
National Ambient Air Quality Standard: 0.12 ppm
Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December
NA: Data are Not Available at this Station.
Source: CARB. 1991-1998 "Air Quality CD-ROM"

Ozone formation is influenced significantly by year-to-year changes in atmospheric conditions. For this reason, a long-term trend in ambient ozone levels is needed to understand if a region is experiencing reductions in its ambient ozone concentrations or not. As shown in AIR QUALITY Figure 1, the long-term statistics of ozone levels in the San Francisco Bay Area region shows that this region has made significant strides toward attainment of the previous federal ozone 1-hour standard. However, the Bay Area is still in violation of the State and Federal ozone standards.

The reasons for the recent violations of the federal ozone standard shown in the AIR QUALITY Figure 1 are not known. However, one important characteristic of the last few years is that more exceedences have been observed during weekends, when NO_x emissions are expected to go down by 30 percent, and VOC emissions would only be reduced by 10 percent from the emission levels expected during weekdays (SCAQMD 1997). The "weekend effect", modeling analyses, and other corroborative analyses suggest that the air basin may be VOC limited. This means that any reductions in NO_x emissions may be counterproductive unless accompanied by reductions in VOC emissions. The BAAQMD has developed its State Implementation Plan (SIP) in which it identified the strategy to bring the air basin back to attainment of the national 1-hour standard (BAAQMD Ozone Attainment Plan1999). Additional studies will be conducted in the future to better understand the ozone problem in the Bay Area air basin and surrounding air basins.

The study results will be used to develop equitable and more effective air quality management strategies to reach attainment of federal air quality standards.

AIR QUALITY Figure 1
District Ozone Design Value 1970-1998



Each design value represents the fourth highest concentration recorded in the air basin during the previous three years. Design values are used to determine attainment status. Source: BAAQMD, 1998

CARBON MONOXIDE (CO)

As AIR QUALITY Table 2 shows that the highest one hour and eight hours concentrations are significantly less than California Ambient Air Quality Standards. CO emissions is a local pollutant found near the source of emission with high concentrations. CO emissions is predominately generated as a result of the internal combustion process. Automobiles and mobile sources are the principal source of the CO emissions. CO emissions can also be generated from fireplaces and wood-burning stoves. Industrial sources contribute for less than 10 percent of the ambient CO levels in the Bay Area. There is no violation of California Ambient Air Quality Standards or National Ambient Air Quality Standards since 1992 for the one hour or the eight hour standards in the San Jose area.

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since the mobile sector (cars, trucks, busses) is the main source of CO, we expect ambient concentrations of CO to be highly dependent on emissions from the mobile sector. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon.

Carbon monoxide concentrations in San Jose and the rest of the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all the counties in California, with the sole exception of Los Angeles County, are in compliance with the CO ambient air quality standards.

NITROGEN DIOXIDE (NO_2)

As AIR QUALITY Table 2 shows that the highest one hour and annual concentrations in San Jose area are significantly less than California Ambient Air Quality Standards. Approximately 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO_2. NO is oxidized in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 occur during the fall and not in the winter when atmospheric conditions favor the trapping of ground level releases but lack significant photochemical activity (less sun light). In the summer the conversion rates of NO to NO_2 are high but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard. As shown in the following equation the formation of NO_2 in the summer with the help of the ozone.

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

PARTICULATE MATTER (PM)

As Table 4 indicates, the project area also annually experiences a number of violations of the state 24-hour PM10 standard. The violations of the state 24-hour standard occur predominately between the months of August and February, with the highest number of violations occurring from October through February.

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SO_x and VOC from turbines, and ammonia from NO_x control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO3), sulfates (SO4), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

AIR QUALITY Table 4
PM10 Air Quality Summary, 1991-1998
Maximum 24-hour Average Concentration (µg/m^3)

Year.	4 Th St			Moorpark			Piedmont St			Tully Rd			W. San Carlos		
	Max 24-hr Avg. (ppm)	Days Above State Standard	Months Violations occurred	Max 24-hr Avg. (ppm)	Days Above State Standard	Months Violations occurred	Max 24-hr Avg. (ppm)	Days Above State Standard	Months Violations occurred	Max 24-hr Avg. (ppm)	Days Above State Standard	Months Violations occurred	Max 24-hr Avg. (ppm)	Days Above State Standard	Months Violations occurred
1991	153	26	J, F, O, N, D	120	13	J, O, N, D	NA	NA	NA	111	11	J, O, N, D	111	14	J, O, N, D
1992	106	13	J, Au, S, O, N, D	104	8	J, N D	NA	NA	NA	110	11	J, F, Jl, O, N, D	112	9	J, Au, N, D
1993	92	8	J, M, N, D	76	3	N, D	NA	NA	NA	101	7	J, N, D	93	5	M, N, D
1994	92.6	7	J, F, D	66.6	4	J, F, D	NA	NA	NA	90.2	7	J, F, N, D	79.5	6	J, F, D
1995	59.7	4	F, O, N	54.5	1	O	57.4	1	O	48.6	0	0	45.8	0	0
1996	76.1	2	F, N	58.4	1	N	58.7	2	F, N	66.8	1	N	NA	NA	NA
1997	78	3		60.7	3	J, D	55.3	1	J	95	3	J, D	NA	NA	NA
1998	92	3	Ap, O, D	42.5	0	0	54.4	1	Ap	88.5	1	D	NA	NA	NA

California Ambient Air Quality Standard: 50 µg/m^3 (24-hour average)
National Ambient Air Quality Standard: 150 µg/m^3 (24-hour average)

Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December

NA: Data are Not Available at this Station.

Source: CARB. 1991-1998 “Air Quali ty CD-ROM”

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NO_x emissions from combustion sources. The nitrate ion concentrations during the winter time are a significant portion of the total PM10 and should be even a higher contributor to particulate matter of less than 2.5 microns (PM2.5). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) and some as sodium nitrate. If we consider the ammonium and the sodium associated with the nitrate ion, we can estimate much higher PM nitrate contributions to the total PM than can be inferred by just looking at the table.

The air agencies in California are now deploying PM2.5 ambient air quality monitors throughout the state. PM2.5 ambient air quality attainment plans, if needed, are due to the U.S. EPA by 2005. As with PM10, information from existing PM2.5 research monitors in California indicates that there have been significant reductions in ambient PM2.5 concentrations in the state (Watson 1998) and that the Bay Area air basin may be in attainment of the new PM2.5 standards.

The highest PM concentrations are measured in the winter. During wintertime high PM episodes, the contribution of ground level releases to ambient PM concentrations is disproportionately high. For example, wood smoke contributes approximately 47 percent of the PM10 mass in San Jose, while the contribution at Pittsburg may be on the order of 30 percent (Chow et al. 1995). The contribution of woodsmoke particles to the PM2.5 concentrations may be even higher, considering that most of the woodsmoke particles are smaller than 2.5 microns.

OTHER AIR POLLUTANTS

There are also ambient air quality standards for sulfates and lead. A full description of the measured ambient air concentrations in San Jose area is contained in section 8.1.3.5 and 8.1.3.7 of the AFC. The ambient concentrations of these pollutants are well below their respective standards.

METCALF ENERGY CENTER ESTIMATED EMISSIONS

CONSTRUCTION PHASE

The construction phase includes the power plant and ancillary facilities (i.e., transmission lines, and pipelines for reclaimed water, natural gas, fire and potable water). The construction of the proposed power plant will result in temporary emissions for approximately 20 months. All construction scheduling is based on a 40-hour per week. The activities during the main phase of construction will include site preparation including cleaning, grading and excavation for the foundation. After the site preparation is completed, the construction of the foundations will follow. Installations and assembly of mechanical equipment will begin soon after the foundation work is completed.

Fugitive dust will be emitted primarily during the site preparation, grading and excavation, travelling on the unpaved surfaces and during the loading and unloading of soil from/to the site. Criteria pollutants also will be emitted during the

construction of project from combustion emissions. These emissions are primarily exhaust from the diesel construction equipment used in all phases of the site preparation, exhaust from water trucks, welding equipment, workers vehicles, delivery trucks, generators and compressors.

Table 8.1E-1 and its attachments in the AFC presents detailed construction emission estimates for fugitive dust, PM10, NO_x, CO, SO_x, and VOC emissions from vehicle. It is important to understand that construction estimated emissions are highly unavoidable and speculative since detailed activity data can not be forecast accurately and the emission factors used in these estimations are known to be worst case estimates.

COMMISSIONING AND OPERATIONAL PHASES

"Commissioning" is the technical term used to describe, in general, all the initial operations of the power plant once it has been physically installed but is not yet in commercial operation. Commissioning starts with the first firing of fuel in the GT/HRSG or in the auxiliary boilers. During commissioning the control systems are tested, the burners are tuned up, the inside and outside of tubes are cleaned up, and the control systems are installed after determining that there are no contaminants in the GT/HRSG that may damage the surfaces of the catalysts. It is important to emphasize that during the commissioning period, which can last for several months, the power plant will operate without emission controls. Commissioning ends with the start of commercial operation, which is usually signaled by the issuance of the Permit to Operate (PTO) from the local air district.

The proposed Metcalf Energy Center is a combined cycle power plant with two new power trains. Each power train consists of a Westinghouse 501F gas turbine rated at 200 MW, a duct burner and a heat recovery steam generator (GT/HRSG). The steam from the heat recovery steam generators will be fed to a steam turbine rated at 234 MW. The actual operation of turbines will range between 70 percent to 100 percent of their maximum rated output. Supplemental firing, which is limited to 1500 hurs/year, will be provided by the duct burners up to 200 MMBtu/hr to maintain required electricity and steam production rates. The facility will also include 10-cell mechanical cooling tower operates 8760 hours/year, a 600 kW emergency generator operates at a maximum of 200 hours/year and a 300 hp Diesel fire pump engine operates at a maximum of 100 hours/year. AIR QUALITY Table summarizes the hourly, daily and annual air emissions associated with the operation of the Metcalf facility.

The Metcalf Energy Center will burn only natural gas, with no provisions for an alternative backup fuel. The exclusive use of natural gas an inherently clean fuel, compared to oil or coal, will limit the formation of VOC, PM10, and SO_x emissions. The combustion turbines will be equipped with low-NOx combustors to minimize NO_x formation. After combustion, the turbine exhaust gasses will be treated by Selective Catalytic Reduction (SCR) systems to further reduce NO_x emissions. Continuous emissions monitoring system (CEMs) will be required and installed to closely monitor the project's emission levels. Calpine/Bechtel is not proposing to use post-combustion oxidizing catalyst at this time to further control CO and VOC

emissions. AIR QUALITY Table 5 summarizes the maximum facility heat input rates (natural gas use) in MMBtu.

AIR QUALITY Table 5
Maximum Hourly, Daily, and Annual Emissions

	NO_x	CO	VOC	PM10	SO_x
GT1 (lb/hr)	17.97	43.84	5.0	10.0	1.2
GT2 (lb/hr)	1797	43.84	5.0	10.0	1.2
GT1 w/DB (lb/hr)	19.21	46.8	5.4	12.0	1.28
GT2 w/DB (lb/hr)	19.21	46.8	5.4	12.0	1.28
Cooling Tower (lb/hr)	-	-	-	1.81	-
GT-S (lb/hr)	80	838	16.0	10.0	
EG (lb/hr)	1.77	3.02	1.42	0.28	0.004
FPE (lb/hr)	3.9	2.35	0.48	0.17	0.106
Total Facility Daily Emissions (lb/day)					
	1366.4	8,595.7	332.2	567.8	57.9
Total Facility Annual Emissions (Ton/year)					
	185.6	736.0	49.2	98.7	10.6

GT1 = the first gas turbine.
GT1 w/ DB = the first gas turbine and Duct Burner.
GT-S = Start-up emissions from either GT.
EG = Emergency Generator
FPE = Fire Pump Engine

Source: AFC, Supplement C, dated Feb. 15, 2000.

The following AIR QUALITY Table 6 delineates the maximum heat rate in million Btu (MMBtu) assumptions underlying the emission calculations for the new equipment for the Metcalf Energy Center shown in the above table.

AIR QUALITY Table 6
Maximum Hourly, Daily, and Annual Fuel Consumption

	Hourly	Daily	Annual
	(MMBtu/hr)	(MMBtu/day)	(MMBtu/yr)
GT1	1990.5	15,924	14,451,030
GT2	1990.5	15,924	14,451,030
GT1 + DB	2124	33,984	3,186,000
GT2 + DB	2124	33,984	3,186,000
Total Facility	4277	100,522	35,332,860

Source: AFC Table 8.1-15

PROJECT IMPACTS

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during combustion turbine start-up 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 7 shows the modeled fumigation results and impacts on the 1-hour NO2, CO, and SO2 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 analyses show that fumigation impacts at either partial load or full load will not violate the NO2, CO or SO2 1-hour standards.

AIR QUALITY Table 7
CTG Fumigation Modeling Maximum 1-Hour Impacts

Pollutant	Averaging Time	Fumigation Impact ($\mu g/m^3$)	Start-up Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)
NO2	1-hour	13.0	81.4	226	470
CO	1-hour	45.6	1942.8	11500	23000
SO2	1-hour	0.63	2.8	107	650
PM10	24-hour	3.2	-	95	50

MODELING APPROACH

Calpine/Bechtel used the SCREEN model to select the worst case turbine configuration that would produce the highest emission impacts. The SCREEN model, which is approved by EPA, is designed to provide conservative estimates of emission impacts. Based on the results of the SCREEN model, Calpine/Bechtel modeled the Westinghouse gas turbines and HRSGs configuration, including the duct burners, using a more refined modeling analysis. This more refined modeling analysis was done with the EPA approved Industrial Source Complex (ISC) model, and used near-by meteorological data collected at the IBM station in 1993.

SITE REPRESENTATION

EPA defines the term “on-site data” as data that would be representative of atmospheric dispersion conditions at the source and locations where the source may have a significant impact on air quality. The requirement of the meteorological data originates in the Clean Air Act at section 165 (e)(1). It necessitates an analysis of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under the Act

which will be emitted from the facility. The meteorological data is considered representative of the project area depends on: a) the proximity of the monitoring site to the project area; b) the complexity of the topography of the area; c) the exposure of meteorological sensors; and d) the period of time during which the data are collected. Based on the above criteria, IBM monitoring station is the closest station to the proposed site, at approximately 3 miles northwest of the site and its data was chosen to best represent the project site. All meteorological data reported at IBM site represents the proposed project site taking in consideration the Tulare Hill height and the slope of the terrain.

CONSTRUCTION IMPACTS

Calpine/Bechtel estimated the impacts of construction-related emissions using the ISC model. AIR QUALITY Table 8 provides a summary of the maximum estimated impacts. The modeling results indicate that the construction-related emissions under worst conditions would cause violations of the one hour NO_2 standard and 24 hour and annual PM10 standards. It is also important to note that these are temporary impacts that would only occur during the construction phase of the project, and they reflect the implementation of some construction related mitigation measures which will be included in the conditions of certification proposed by Energy Commission staff to minimize emissions.

The results of this modeling effort are shown in AIR QUALITY Table 8. They show that the construction activities would cause a violation of the state 1-hour and annual average NO2 standards and further exacerbate existing violations of the state 24-hour and annual average PM10 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. These predicted impacts are of such a high magnitude for a number of reasons.

AIR QUALITY Table 8
Maximum Estimated Construction-Related Incremental Impacts

Pollutant	Averaging Time	Incremental Impacts ($\mu g/m^3$)	Maximum Background ($\mu g/m^3$)[1]	Maximum Total Impacts ($\mu g/m^3$)	State Limiting Standard ($\mu g/m^3$)	Federal Limiting Standard ($\mu g/m^3$)	Percent of the Standard (%)
NO_2 [2]	1-hour	353	226	579	470		123
	Annual	34	51	85	-	100	85
PM10	24-hour	157	95	252	50	150	504
	Annual	28.6	25.9	54.5	30	-	181.6
CO	1-hour	616	11500	12116	23000	40000	52.7
	8-hour	607	7000	7607	10000	10000	76
SO_2	1-hour	66	107	173	650	-	26.6
	24-hour	7.6	24	32	109	365	29
	Annual	1.3	0	1.3	-	80	1.6

[1] Based on maximum daily emissions during month 15 of construction period.
[2] Ozone limiting method applied to the 1-hour average using the maximum background O3 and NO2 levels in the last three years.

Sources: AFC Table 8.1E-4 from AFC.

First, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Second, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment, 4 large bulldozers, 4 backhoes, 12 cranes and 5 large flatbed trucks would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 20 months construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire 20 months construction. During the other months of construction work, considerably less emissions generating equipment will be used and thus the impacts will be lower.

On the other hand, normally, the analysis assumes that all the NOx emitted from the vehicles is in the form of NO_2. In reality, approximately 90 percent of NOx emissions from a combustion source are in the form of nitrogen oxide (NO), and eventually that NO would oxidize to NO_2. However, the NO2 impact shown in the modeling analysis reflects the possible NO2 impacts because Calpine/Bechtel took in consideration that only 10 percent of the NOx is NO_2 (ozone limiting method).

In addition, we should add that the maximum fugitive dust PM10 emission levels and impacts would not occur during the winter time, when the highest measured PM concentrations are historically measured in the Bay Area air basin. This is due to the fact that the ground tends to be wet during the winter because of the rains, and the relative humidity is high, which reduces the likelihood and amount of fugitive dust formation.

PROJECT NORMAL OPERATIONAL IMPACTS

Calpine/Bechtel has assessed the impact of the operation of the facility using EPA-approved air quality dispersion models and guidelines without considering the offsets that will be provided. Staff, CARB and BAAQMD find the Calpine/Bechtel analysis of the operational impact to be acceptable. The AFC presents the SCREEN and the ISC modeling analyses in Appendix 8.1B and supplement C. The impact analyses were used to determine the worst case ground level impacts of the facility. The results show that the facility, by itself, does not violate the State or Federal ambient air quality standards for all pollutants.

However, the PM10 impact from the facility, when added to the existing background levels, which are already above the State Standard, will further violate the 24 hour State Standard. The applicant will mitigate the project's PM10 impact by providing emission offsets as discussed in the mitigation section below. The FSA will address the specifics of the mitigation package, location of the ERC sources, quantities and type of mitigation. AIR QUALITY Table 9 presents a summary of the ISC modeling results for the proposed Metcalf Energy Center.

AIR QUALITY Table 9
ISC Modeling Results

Pollutant	Averaging Time	Facility Maximum Impact ($\mu g/m^3$)	Maximum Background ($\mu g/m^3$)	Maximum Total Impacts ($\mu g/m^3$)	State Limiting Standard ($\mu g/m^3$)	Federal Limiting Standard ($\mu g/m^3$)	Percent of Standard (%)
NO_2	1-hour	187.7	226	413.7	470		88
	Annual	0.67	51	51.7	-	100	51.7
CO	1-hour	650.3	11500	12150	23000	40000	53
	8-hour	548.6	7889	8438	10000	10000	84.4
PM10	24-hour	9.3	95	104.3	50	150	208.6
	Annual	1.1	25.9	27.0	30	-	90
SO_2	1-hour	33.4	107	140.4	650	-	21.6
	24-hour	0.6	24	24.6	109	365	22.6
	Annual	0.06	0	0.1	-	80	0

Source: AFC Table 3.1-9, Supplement C.

CUMULATIVE IMPACTS

The AFC discusses the potential cumulative air quality impact from the Metcalf Energy Center. However, the results of the modeling analysis are not shown in the AFC. All prior filing with the California Energy Commission including supplement A, B and C do not discuss the cumulative impacts from the project with other future projects in the area. In analyzing the cumulative potential impact, staff has identified the following projects to be modeled with Metcalf Energy facility a) the full build-out of the Coyote Valley Research Park (Cisco Project) to around 50,000 employees, and b) the proposed Urban Reserve development of up to 25,000 dwellings on the 170 acres. Calpine/Bechtel has submitted the cumulative analysis on April 28,2000. Because of the schedule and the deadline for the PSA, the final staff assesment will evaluate the cumulative analysis and include the details of these analysis.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Calpine/Bechtel is proposing to mitigate the project's potential air quality impacts using a state of the art combustion technology, installing post-combustion control devices, and providing offsets, as required by the BAAQMD's regulations. Calpine/Bechtel is proposing to install a gas turbine equipped with Low NO_x combustors that can achieve low NO_x concentrations. The GT/HRSG will be equipped with SCR to control NO_x to 2.5 ppm without the need for steam or water injection. However, Calpine/Bechtel is not proposing to install a CO catalyst to reduce CO emissions because the are proposing to meet the District's 10 ppm BACT limit.

ADEQUACY OF PROPOSED MITIGATION

BACT is the levels applicable to individual projects that are typically determined by the local air district with input from the Air Resources Board (ARB) and EPA.

Recently, in both the High Desert , Sutter Power Plant AFC cases and EPA letter to all air quality districts dated March 24, 2000, the EPA has clearly stated their position regarding what they consider to be BACT and Lowest Achievable Emission Rates (LAER). EPA believes that BACT/LAER analyses for combined cycle gas turbine power plant projects must include consideration of technologies like SCONOX and XONON to achieve lower NOx and CO limits without the use of ammonia or oxidation catalyst. Furthermore, EPA believes that SCONOX is commercially available for large size turbines and there is no problem with the scale-up issue.

Control of NOx Emissions

The project's NO_x emissions consist primarily of nitric oxide (NO) and a small percentage of nitrogen dioxide (NO_2). Thermal NO_x is the product of the oxidation of N_2 (present in the air used for combustion) at the temperatures present in the combustion process. Some NO_x is formed from the oxidation of nitrogen present in the fuel. Nitrogen is not present in significant quantities in natural gas, so most of the NO_x emissions from this project are due to thermal NO_x.

Combustion chamber NO_x can be controlled by reducing the flame temperature in the combustion chamber through quenching steam and dilution using water and steam injection. Additionally, thermal NO_x can be controlled with combustor designs that premix the air and fuel and stage the combustion process (a reducing atmosphere followed by an oxidizing atmosphere). NO_x emissions from the Metcalf Energy Center will be controlled through the use of dry low NO_x combustors in the CTGs and the use of SCR as a post-combustion emission control. The turbines will be equipped with a number of dry low-NO_x combustors to ensure optimal uniform temperature distribution in the primary air zone. A reduction in NO_x emissions is also achieved by raising the mean air/fuel ratio. The use of dry low-NO_x burners produces emissions as low as 25 ppm when natural gas is burned before entering the SCR.

In addition, Calpine/Bechtel's proposed SCR system will control NO_x emission levels to 2.5 ppm corrected @ 15 percent O_2. SCR is a process that chemically reduces NO_x by injecting ammonia (NH_3) over a catalyst in the presence of oxygen (O_2). The process is termed selective because the NH_3 reducing agent preferentially reacts with NO_x rather than O_2 to form N_2 in the presence of excess O_2 at temperatures in the range of 400 to 750 ^oF. If the temperature is lower than 400^oF, the ammonia reaction rate is low, and therefore, NH_3 emissions (called ammonia slip) will increase.

Control of Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Good operating and maintenance practices are the only measures proposed for this project to limit the project's CO and reduce VOC emissions. Combustion turbines inherently generate low CO and VOC emissions when burning natural gas. However, while high combustion temperatures, fuel/air mixing, and the excess air inherent in the CTG's combustion process favor complete combustion of fossil fuels. these conditions, also lead to higher NO_x emissions. Current CTG designs attempt to balance achieving low NO_x emissions (from the CTG prior to post-combustion

controls) while keeping CO and VOC emissions low. In all power plants recently licensed by the California Energy Commission, except for Delta Energy Center, oxidation catalysts have been proposed to control CO emission and reduce VOC emission levels.

BAAQMD's BACT determination guidelines for VOC, copy is provided in Appendix B, identify an "oxidation catalyst" as the "typical technology" used to minimize emissions, with 50% reduction by weight in VOC emissions. However, no specific emission concentration limit (e.g. ppm) is specified. Alternatively, Calpine/Bechtel proposed to meet a 2 ppm concentration level during all scenarios of operation of the project without installing an oxidation catalyst. The BAAQMD has agreed in the past, in Delta Energy Facility, to the 2 ppm concentration level during all scenarios of operation of the project and has specified limitations in terms of mass emissions (lb/hr, lb/day, and tons per year) in the conditions of certification. The 2 ppm concentration limit is consistent with the CARB siting guidelines published in June 1999, titled "Guidance for Power Plant Siting and Best Available Control Technology".

With respect to CO, Calpine/Bechtel is not proposing to install a CO catalyst. They propose to meet a limit of 10 ppm over a three hour averaging time during all operating scenarios. They claim that the CO catalyst would increase the project PM10 emissions by approximately 2 lb/hour. Calpine/Bechtel submitted an analysis to support their argument on May 7, 1999. Staff reviewed this issue and believes that the analysis does not justify Calpine/Bechtel's position. The catalyst has been installed and operated on number of large project similar to the proposed project without any observations of increase of PM10 emissions. (see Appendix A which addresses this issue in more detail).

CONTROL OF PM10

Natural gas fuel contains only trace quantities of noncombustible material. Particulate emissions (PM_{10}) will be controlled by inlet air filtering for the combined cycle CTG and HRSG unit. In addition, Calpine/Bechtel proposes to use a cooling tower which includes 0.0005% drift eliminator efficiency to reduce PM10 emissions associated with its operation. This is the best control technology available for this purpose.

SULFUR DIOXIDE EMISSIONS CONTROL

The Metcalf Energy Center SO_2 emissions will be controlled by burning only natural gas, which typically contains only traces of sulfur. The emissions from the project's CTGs are expected to be very small without the use of any additional post-combustion SO_2 control equipment. Since natural gas contains only 2000 grains of sulfur per million cubic feet, the resulting SO_2 emission concentrations should be less than 4.0 ppm @15% O_2.

EMISSION OFFSETS

Emission reduction credits (ERCs) can be created when existing permitted emission sources cease operation or reduce their operation below permitted levels. The ERCs are reviewed and approved by the local air district and recorded in their

“bank” for future use. To fully mitigate the facility's potential emission increases, Calpine/Bechtel plans to purchase emission reduction credits (ERCs) from the BAAQMD ERC bank and in the San Jose area.

Offsets, in the form of ERCs, are required for the Metcalf Energy Center for NO_x, and VOC in order to assure the project will not interfere with BAAQMD’s future attainment of ozone. BAAQMD will not require PM10 mitigations of this project because the PM10 project emissions are less than the BAAQMD threshold of 100 tons per year. To comply with CEQA, California Energy Commission staff will require mitigation of the project emissions of 98.6 tons per year. Calpine/Bechtel agreed in concept at the April 5, 2000 public workshop to provide the mitigation. However, the Calpine/Bechtel has not provided the mitigation package yet.

In past siting cases some intervenors have argued that the ERCs are not actual mitigation since the emission reductions have already occurred and, therefore, ambient air quality can only deteriorate with the new source of emissions. However, the BAAQMD, in its Air Quality Management Plan (AQMP), includes banked ERCs in its planning emissions inventories for future years as actual ongoing emissions (BAAQMD, 1997b). Therefore, the future effects of new sources due to emission increases are already taken into account in the AQMP, including the use of ERCs as a source of mitigation or offsets. The new source will not detract from the BAAQMD’s attainment strategy. Consequently, we believe that banked offsets in this case constitute real mitigation of potential impacts from the proposed project in the context of the BAAQMD’s overall attainment strategy. An air quality table will be provided in the FSA which will summarize all the ERCs sources and the interpollutant trading ratio that was used for each of criteria pollutant.

CEQA REQUIREMENT

In addition to all the BAAQMD requirements and analysis as presented in the PDOC (see Appendix D), CEQA will require the staff to conduct the following analysis before reaching to a recommendation or a conclusion on the proposed project:

1. Evaluation on the construction emissions should be completed. In the AFC, Calpine/Bechtel had analyzed the construction emissions of the facility without analyzing the linear facilities. Staff is requiring Calpine/Bechtel to fully evaluate the linear facilities as part of the construction of the project.
2. Evaluation of the construction impacts should be conducted. Calpine/Bechtel has completed these analysis which shows that during construction PM10 and NO_2 standards will be violated.
3. Mitigate construction impacts to less than significant. Staff will impose conditions of certification to deal specifically with the construction phase of the project. The details of these conditions will be part of the FSA.
4. Cumulative impact analysis must be estimated. Calpine/Bechtel had submitted the cumulative analysis on April 28,20000 including future project within six miles radius from the proposed project. Staff will review and evaluate the impacts and present it in the FSA.
5. Metcalf Energy Center PM10 emissions including cooling towers emission will be mitigated. The proposed project will contribute to existing violations of

PM10 State Standards which will be mitigated by providing offsets of other mitigation measures. Staff did not receive the final proposal from Calpine/Bechtel on this issue.

6. Secondary formation of PM10 emissions will need to be evaluated because of the violations of PM10 standards.

FACILITY CLOSURE

Eventually the Metcalf Energy Center 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, 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 BAAQMD, 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 the Metcalf Energy Center 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 indicate that the applicant will comply with the applicable construction related permit conditions included in the Conditions of Certification, which includes the control of fugitive dust emissions.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the evidence of record, until April 10, 2000, the California Energy Commission staff can not reach a conclusion and this time. Staff finds the need for the following issues to be resolved before the staff makes final recommendations on this project:

1. **The project's PM10 Emissions Mitigation should be provided;** the ambient air quality background of the project site is in violation of the California State PM10 Standards. The Metcalf Energy Center will contribute to existing PM10 violation. Therefore, all potential PM10 emissions from the project should be fully mitigated to negate the adverse impact of the project's PM10 emissions. The staff believes that Calpine/Bechtel should mitigate the project's PM10 emissions by providing adequate mitigation for 98.6 tons.
2. **Project's Offsets for NOx and VOC need to be evaluated;** staff did not receive the final ERCs package for NOx and VOC. Staff needs to evaluate this package closely before reaching a decision on the adequacy of such mitigation (sources, quantities and type.)
3. **Cumulative Impacts analysis need to be evaluated;** Calpine/Bechtel should analyze the cumulative impacts from the proposed project as required by CEQA guidelines. All prior filings with the California Energy Commission including

supplement A, B and C do not discuss the cumulative impacts from the project with other future projects in the area. In analyzing the cumulative potential impact, staff has identified, in a data request, the following projects to be modeled with Metcalf Energy Center a) the full build-out of the Coyote Valley Research Park (Cisco Project) to around 50,000 employees, b) the proposed Urban Reserve development of up to 25,000 dwellings on the 170 acres. Calpine/Bechtel did not complete their evaluation of the cumulative impact. Staff needs to fully assess this evaluation before reaching a conclusion on this project.

4. **Oxidation Catalyst should be installed to control VOC emissions;** As mentioned before, Calpine/Bechtel is not proposing to install a CO catalyst on the Metcalf Energy Center. BAAQMD's BACT guidelines specifically stated that CO catalyst is required to control VOC. Calpine/Bechtel instead is proposing to meet 2 ppm averaging over three hours, which is not part of the BAAQMD guidelines. Staff believes that CO catalyst should be installed on this facility to control VOC and meet the local District BACT guidelines.
5. **Construction Emissions of the linear facilities should be evaluated;** Calpine/Bechtel estimated the construction emissions and the impact from the Metcalf Energy Center. However, Calpine/Bechtel failed to analyze the criteria pollutant associated with the development of the linear facilities (gas lines, water lines and transmission lines). Staff requires that the construction of the linear facility to be evaluated to fully comply with CEQA requirements.
6. **Reduction of PM10 emissions impact during construction:** As the modeling analysis shows in the AFC, PM10 impact during construction is significant. Giving the implementations of the proposed mitigation measures proposed by Calpine/Bechtel in the AFC, the project PM10 impact will violate the State and the Federal standards. Staff believes that further mitigation for PM10 will be required to reduce the project's potential violations of the standards.
7. **Ammonia slip should be limited to 5 ppm:** Calpine/Bechtel is proposing 10 ppmvd ammonia slip while controlling NOx emissions at 2.5 ppmvd over one hour averaging time. As stated in CARB guidelines, June 1999, and guaranteed by several SCR manufacturers, 5 ppmvd is achievable limit while controlling NOx at 2.5 ppmvd averaging over one hour.
8. **Secondary PM10 emissions should be evaluated:** Because of the level of the PM10 in the project area which violates the State standards, staff believes that secondary PM10 emissions should be fully evaluated for this project. The formation of such pollutant will result as the project emits SOx, NOx, and ammonia slip.
9. **BACT Analysis: "top-down" approach is required:** BACT analysis, as stated in the AFC does not comply with 40 CFR 52.21, because it did not consider all available control technologies required in the "top-down" approach (see EPA letters dated February 4, 2000, February 10, 2000 and March 24,2000) . SCONOx technology is approved, feasible technology for scale-up for a project with this size since last December 1999 (see EPA letter dated December 20, 1999). SCONOx technology has a lot of environmental benefits such as: a) reduces and guarantees NOx emissions to less than 2.0 ppmvd averaging over

three hours and can achieve 1 ppmvd averaged over 15 minutes as demonstrated in the Federal facility in Vermont and another facility in Massachusetts; b) reduces CO emissions to 6 ppmvd; c) limits VOC emissions to 1 ppmvd; d) this technology is unlike SCR technology, it eliminates the use of ammonia, and therefore eliminates the ammonia slip and reduces the formation of secondary PM10. Staff believes that Calpine/Bechtel must include SCONOx in their BACT analysis, explaining why SCR technology was chosen over SCONOx technology.

10. **Compliance** with **City of San Jose Environmental Performance Standards is required;** The City of San Jose Environmental Performance Standards do not allow any manufacturing operation to produce air-borne pollutants at the property line of the subject parcel. Calpine/Bechtel need to explain how the proposed project will comply with local requirements. The document where these standards are called "City of San Jose. North Coyote Valley Campus Industrial Area Master Development Plan." Adopted by the City Council May 28, 1985 (Revised November 8, 1999) see Appendix C.

REFERENCES

Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.

Calpine/Bechtel. 1999b. Various confidential filings—paleontological resources, cultural resources, air quality dated April 30, May 19, May 20, and August 23, 1999.

Calpine/Bechtel. 1999c. Data Adequacy Supplement #1, dated June 7, 1999.

Calpine/Bechtel. 1999e. AFC Supplement A, October 1, 1999.

Calpine/Bechtel. 1999f. AFC Supplement B, October 15, 1999.

Calpine/Bechtel. 1999h. Set 1a data responses to CEC data requests submitted to the California Energy Commission on August 23, 1999.

Calpine/Bechtel. 1999i. Set 1b data responses to CEC data requests submitted to the California Energy Commission on August 27, 1999.

Calpine/Bechtel. 1999o. Application to the Bay Area Air Quality Management District for a determination of Compliance dated June 14, 1999.

Calpine/Bechtel. 1999p. Set 2a data responses dated October 15, 1999, docketed on October 18, 1999.

Calpine/Bechtel. 2000b. AFC Supplement C, February 15, 2000.

United States Environmental Protection Agency. Region IX. Letter dated March 24, 2000, to all the all Air Quality Management Districts.

APPENDIX A

ENGELHARD ANALYSIS OF THE CO CATALYST

APPENDIX B

Copy of the BAAQMD's best Available Control Technology (BACT) Guideline

APPENDIX C

North Coyote Valley Campus Industrial Area Master Development Plan

APPENDIX D

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

PRELIMINARY DETERMINATION OF COMPLIANCE

METCALF ENERGY CENTER

PUBLIC HEALTH

Michael Ringer

INTRODUCTION

The purpose of staff's public health analysis is to determine if emissions of toxic contaminants from the proposed Metcalf Energy Center (MEC) will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section. Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** and **Worker Safety and Fire Protection** sections, respectively. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams to the public sewer system are discussed in the **Soils and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

METHOD OF ANALYSIS

Public health staff is concerned about toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people may come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

Air pollutants for which no air quality standards have been set are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since noncriteria pollutants do not have such standards, a process known as health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment procedure consists of the following steps:

1. Identify the types and amounts of hazardous substances that the MEC project could emit to the environment;
2. Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;
3. Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and
4. Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, a simplified study is done that is designed to overestimate public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the power plant will be much lower than the risks which are estimated by the assessment. This is accomplished by examining conditions that would lead to the highest, or worst-case, risks and then using those in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the plant;
- Assuming weather conditions that would lead to the highest ambient concentration of pollutants;
- Using the type of air quality computer model which results in the highest impacts;
- Calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- Assuming that an individual's exposure to cancer-causing agents occurs for 70 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances which could present a health hazard from noninhalation pathways of exposure (see CAPCOA, Table III-5). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA , p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term).

Acute health effects result from short-term (1-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those which arise as a result of long term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as emphysema and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called "reference exposure levels" or RELs (see CAPCOA, p. III-36). RELs are amounts of toxic substances to which people can be

exposed and suffer no adverse health effects. These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

If someone is exposed to multiple toxic substances, an adverse health effect could result, even if each individual substance is not present at harmful levels. Therefore, the assumption is made that the effects of each substance are additive. In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact (CAPCOA, p. III-37). In other cases, the effects may be antagonistic (where the effects are less than the sum), and the resultant health impact may be overstated.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions. In reality, the risk is generally too small to actually be measured. For example, the one in one million risk level represents a one in one million increase in the normal risk of developing cancer over a lifetime, at whatever location is estimated to have the worst-case risk.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called potency factors, these are published in the CAPCOA Guidelines), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower or even considerably lower than those estimated.

Failure to pass the initial screening analysis does not automatically indicate that the project would pose a significant risk to public health, but that a more detailed assessment, using more realistic project-specific assumptions, is necessary to more accurately determine potential public health risks.

SIGNIFICANCE CRITERIA

Commission staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. Significance of project health impacts is determined separately for each of the three categories.

ACUTE AND CHRONIC NONCANCER HEALTH EFFECTS

Staff assesses the significance of non-cancer health effects by calculating a "hazard index". A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels (safe levels). Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

CANCER RISK

Staff presumes that if worst-case toxic emissions from the Metcalf project increase anyone's lifetime cancer risk by one chance in one million ($1x10^{-6}$) or less, then the added risk is de minimis, or one that is so small, that it is effectively "no risk". The Federal Food and Drug Administration (FDA) made a similar finding in the context of cancer risks from food additives (FDA 1985, p. 51557). They emphasized that the risk level did not mean that one in every one million people would contract cancer, but that the level represented an additional one in one million chance over a person's normal risk of developing cancer in his or her lifetime. On average, for example, the lifetime risk of someone developing cancer is around 250,000 in a million (about one of every four people will have some type of cancer in their lifetime). At the one in one million risk level, the FDA noted that "as far as can be determined, in all probability no one will contract cancer." (Id.)

Staff does not believe that mitigation measures to reduce risk to less than one in one million are warranted, since at that level there is effectively no added cancer risk. Similarly, the Bay Area Air Quality Management District (BAAQMD) Risk Management Policy states that a project with an incremental cancer risk of one in one million or less is acceptable without further risk management consideration, and without further toxics reduction measures (BAAQMD 2000a, p. 4). Further, a survey of 132 regulatory decisions found that, with the exception of one decision, no action was taken to reduce risks below one in a million (Travis et al., 1987).

Staff does not view project-related cancer risks as significant at the de minimus level discussed above, since there is essentially no added risk. Therefore, staff must identify an appropriate level of risk on which to base determinations of significance. Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a risk significance level. Title 22, California Code of Regulations, § 12703(b) states that "the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This level of risk is equivalent to a cancer risk of ten in one million, or 10×10^{-6}. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65.

The significant risk level of ten in one million is consistent with the level of significance adopted by the BAAQMD Board of Directors pursuant to Health and Safety Code § 44362(b), which requires notification of nearby residents when an air district determines that there is a significant health risk from a facility. In addition, BAAQMD's Risk Management Policy states that a project with an incremental cancer risk of between one and ten in a million is acceptable if best available control technology has been applied to reduce risk (BAAQMD 2000a, p. 4). In general, BAAQMD would not approve a project with a cancer risk exceeding ten in one million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks to be above the one in one million level, refinements in assumptions could establish lower, more realistic risk estimates. If facility risk continues to exceed the de minimus level, staff would consider requiring appropriate measures to reduce risk to the extent possible. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten in one million, staff would deem such a risk to be significant, and would not recommend project approval.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following state and local LORS generally apply to the protection of public health. These provisions have established the basis for Energy Commission staff's determination regarding the significance and acceptability of project-related impacts on public health.

STATE

CALIFORNIA HEALTH AND SAFETY CODE SECTIONS 39650 ET SEQ.

These sections mandate the Air Resources Board and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify

pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

CALIFORNIA HEALTH AND SAFETY CODE SECTION 41700

This section 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 to business or property."

LOCAL

BAY AREA AIR QUALITY MANAGEMENT DISTRICT RULE 2-1-316

This rule requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air contaminants that exceed specified amounts.

SAN JOSE NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA MASTER DEVELOPMENT PLAN

The Master Development Plan contains Environmental Performance Standards. Section C. 6 (Air Quality) states "No manufacturing operation shall be permitted which produces odors, fumes, smoke, or other air-borne pollutants detectable, without instruments, at the property lines of the subject parcel or which produces any dangerous emissions whatsoever."

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density which, in turn, affects public exposure to project emissions. Additional factors affecting potential public health impact include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed site is located on approximately 14 acres in the northern end of North Coyote Valley, separated from urban San Jose by Tulare Hill. The site topography is relatively flat, with an elevation about 252 feet above sea level, on the floor of the Santa Clara Valley. In the vicinity of the proposed site, the Santa Clara Valley is less than a mile wide and bounded by the Santa Teresa Hills (elevation 1,100 feet) on the west-southwest. Other ridges of the Coastal Range, with maximum

elevations of about 1,300 feet, bound the Valley on the northeast. Northwest of the site, the Santa Clara Valley opens into a basin which extend to San Francisco Bay and contains San Jose and its suburbs.

Currently, land at the proposed site is classified as prime agricultural. Existing land uses on the property include old vehicle storage, disposal of construction debris, and some agriculture. Surrounding land is generally undeveloped, with vacant land to the northeast, agricultural land to the north and west, and an electric substation to the east. The Coyote Valley Urban Reserve is located about two miles south of the MEC site. Currently agricultural, future development there is expected to include an independent community with jobs, housing (up to 20,000 to 25,000 dwelling units), commercial facilities, schools, parks, and public transit. Just south of the MEC site lies the 1,444 acre North Coyote Valley Campus Industrial Area, within which is a planned development of 6.6 million square feet of building space to be occupied by a work force of about 19,800 employees. About one mile north of the proposed site, a residential development of 131 single family homes is planned north of Metcalf Road and east of Highway 101.

As mentioned above, the location of sensitive receptors near the proposed site is an important factor in considering potential public health impacts. The nearest residence is on the west side of Monterey Road, about 1,150 feet away (south-southeast of the proposed site). On the east side of Monterey Road, there is a residence about 2,050 feet away. A residential area is located about three-quarters of a mile to the northwest. The nearest schools are located about 6,000 feet (1.1 miles) to the west northwest, and 7,500 feet (1.4 miles) to the southeast. AFC Figures 8.12-1a and 1b show sensitive receptors within a three mile radius of the project site, and descriptions of the receptors are presented in AFC Table 8.12-1. Included in the Coyote Valley Research Park planned development is a day care facility that would serve up to 700 children, housed in one to three buildings on six to eight acres.

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The climate at the project site is dominated by the influence of the Pacific Ocean and the Pacific high-pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific high is at a maximum during the summer, when it is at its northernmost position, and results in strong northwesterly air flow and negligible precipitation. During this period, inversions become strong, winds are light, and the pollution potential is high. The Pacific high's influence weakens during the fall and winter when it moves southwestward, which allows storms from the Gulf of Alaska to reach northern California. About 80 percent of the region's annual rainfall occurs between

November and March. During the winter, inversions are weak, winds often moderate, and the potential for air pollution is low.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents more detailed meteorological data.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of BAAQMD, which includes Santa Clara County as well as eight other Bay Area counties. BAAQMD conducts ambient monitoring of thirteen gaseous toxic air contaminants at 17 locations throughout the district. By combining average toxic concentration levels from all monitoring sites with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air.

In 1997, the background cancer risk calculated by BAAQMD for the Bay area was 194 in one million (BAAQMD 1998, p. 3). The pollutants 1,3-butadiene and benzene (emitted primarily from mobile sources), were the two highest contributors and together accounted for over half of the total risk. The risk from 1,3-butadiene was about 58 in one million, while the risk from benzene was about 54 in one million. Because of the use of reformulated gasoline beginning in the second quarter of 1996, as well as other toxics reduction measures, ambient levels of these two pollutants have been decreasing, leading to a reduction in overall risk during the past few years. For example, the risk was 342 in one million based on 1992 data, 315 in one million based on 1994 data, and 303 in one million based on 1995 data.

The toxic air monitoring station closest to the MEC project is on Fourth Street in San Jose. Ambient levels of the two pollutants discussed above are significantly higher at that station than the Bay area average, probably due to mobile sources. Cancer risks in San Jose for 1,3-butadiene and benzene were about 162 and 78 in one million, respectively, compared to the Bay area average of 58 and 54 in one million.

SITE CONTAMINATION

Site disturbances will occur during facility construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off-site through soil erosion, and uncovering buried hazardous substances.

On behalf of Calpine Corporation and Bechtel Enterprises, Phase I and II Environmental Site Assessments (ESA) were conducted by Environmental Resources Management (ERM) in accordance with American Society for Testing and Materials Standard E 1527-97, Standard Practice for Environmental Site Assessments (ERM 1999). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products

under conditions that may indicate a release or threat of a release from present or past activities. The results of the ESAs are summarized in staff's **Waste Management** section. In addition, a database search was performed for potentially contaminated sites which may be encountered during construction of the linear facilities. These results are also summarized in the **Waste Management** section.

IMPACTS

PROJECT SPECIFIC IMPACTS

Potential risks to public health may occur during both project construction and operation.

CONSTRUCTION IMPACTS

Potential risks to public health during construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

As described in the **Waste Management** section, Phase I and II Environmental Site Assessments (ESAs) have been performed. The ESAs have shown no evidence of significant site contamination, however additional investigation will be required as a result of comments from the Department of Toxic Substances Control (DTSC). Staff has forwarded data requests to MEC and expects further information prior to the Final Staff Assessment.

The **Waste Management** section also discusses potentially contaminated sites which may be encountered during construction of the linear facilities. Of 28 leaking underground storage tanks within 250 feet of either side of the linear facilities, twelve are still under oversight by the Santa Clara Valley Water District for potential groundwater contamination. Contaminated soil or groundwater is likely to exist at the listed sites, but the extent of contamination is not indicated. As a result of comments from DTSC, staff has asked MEC to provide sampling data along linear facilities. As noted in the **Waste Management** section, MEC has proposed procedures to assure proper management of soil that might be contaminated when construction is planned in areas near suspected contamination (MEC 1999b, p. 93).

The operation of construction equipment will result in air emissions from diesel-fueled engines. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the Air Resources Board (ARB) as toxic air contaminants. Because of the many constituents in diesel exhaust as well as evidence that the particles themselves may have intrinsic toxic and

carcinogenic properties, many researchers have used the particles to quantify exposure to whole diesel exhaust.

Exposure to diesel exhaust causes both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants (SRP) recommended a chronic REL (see REL discussion in **Method of Analysis** section above) for diesel exhaust particulate matter of 5 $\mu g/m^3$ and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$ (SRP 1998, p. 6). The SRP did not recommend a value for an acute REL. On August 27, 1998, the ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved SRP's recommendations regarding health effect levels.

Construction of MEC is anticipated to take place over a period of twenty months. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from seven to seventy years. Thus, only acute health effects, those which could occur after a one hour exposure, are examined here. Since the SRP did not recommend an acute REL, one may be derived for screening purposes by multiplying the chronic REL by a factor of 10, to yield a value of 50 $\mu g/m^3$. Such an approach would be considered to be generally conservative, or health protective.

AFC Appendix 8.1E presents exhaust emissions from construction activities. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Worst-case daily exhaust emissions of 9.18 lb/day PM10 are expected to occur in month 15, in the middle of the construction schedule during the installation of major mechanical equipment (Calpine/Bechtel 1999a, AFC Appendix 8.1E, p. 8E-1). MEC estimates that about 86 percent, or 7.92 lb/day of these emissions are from diesel-powered equipment (Calpine/Bechtel 2000c, p. 3). Modeling construction activities, which are assumed to occur for eight hours per day, gives a one-hour maximum concentration of 81.79 $\mu g/m^3$ near the northern fenceline of the project (Calpine/Bechtel 2000c, p. 3 and Figure PH2-1). Areas where the one-hour concentrations are predicted to exceed the 50 $\mu g/m^3$ acute REL as derived above are the uninhabited areas north and east of the proposed site. The modeled one-hour concentration at the nearest residential receptor is 46.65 $\mu g/m^3$, which is below the conservative derived REL of 50 $\mu g/m^3$.

OPERATION IMPACTS

EMISSIONS SOURCES

The emissions sources at the proposed MEC project include a fire pump diesel engine, two gas turbines with heat recovery steam generators, one steam turbine with supplemental duct burners, and the cooling tower. During operation, potential public health risks are related to diesel exhaust emissions from testing the diesel engine-driven fire pump engine, natural gas combustion emissions from the gas turbines and duct burners, and noncombustion emissions from the cooling tower.

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

Diesel exhaust emissions contain a number of toxic compounds. However, a chronic REL and cancer risk factor have been established for diesel particulate matter which may be used to characterize emissions from diesel engines (please see the above discussion under **Construction Impacts**). The diesel engine used for the fire pump must be tested on a weekly basis in accordance with safety requirements, resulting in diesel particulate emissions that must be analyzed for health effects. The BAAQMD Risk Management Policy for Diesel Engines (established February 3, 2000) list criteria for permitting stationary diesel engines, and states that if the annual emissions would result in an incremental cancer risk equal to or less than one in one million over an exposure period of 70 years, the project is acceptable without further risk management considerations.

AFC Supplement C Table 3.1-5 lists noncriteria pollutants that may be emitted from MEC project turbines as combustion byproducts, along with their anticipated amounts (emission factors). Emission factors are from data compiled by the Ventura County Air Pollution Control District and from the California Air Toxics Emission Factors (CATEF) database. AFC Tables 8.6-2 and PH-63-1 (Calpine/Bechtel 1999j, data response # 63) list toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include reference exposure levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the CAPCOA Guidelines (CAPCOA 1993). **PUBLIC HEALTH** Table 1 lists combustion-related toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that acetaldehyde is not of concern due to oral exposure, but if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

Noncriteria emissions from the cooling tower originate from contaminants in the cooling source water that become entrained in liquid water droplets emitted as cooling tower drift. MEC will use recycled wastewater from the South Bay Water Recycling (SBWR) Program for cooling. AFC Table 8.14-2 lists constituents found in SBWR wastewater which could be emitted as part of the drift. AFC Appendix 8.1, Table 8.1A-3 lists the amounts of each pollutant released to the atmosphere in the cooling tower drift based on the pollutant levels in the circulating cooling water.

PUBLIC HEALTH Table 2 lists these substances and shows how each contributes to the health risk analysis.

PUBLIC HEALTH Table 1

Types of Health Impacts and Exposure Routes Attributed to Combustion-Related Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✓	✓	
Acrolein				✓	✓
Ammonia				✓	✓
Benzene			✓	✓	
1,3-Butadiene			✓		
Formaldehyde			✓	✓	✓
Napthalene		✓		✓	
PAHs	✓		✓		
Propylene oxide			✓	✓	✓
Toluene				✓	
Xylene				✓	✓

Source: AFC Table 8.1-18 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993

PUBLIC HEALTH Table 2

Types of Health Impacts and Exposure Routes Attributed to Cooling Tower Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Chronic Noncancer	Acute Noncancer
Ammonia				✓	✓
Arsenic	✓	✓	✓	✓	
Cadmium		✓	✓	✓	
Copper				✓	
Lead		✓	✓	✓	
Mercury		✓			✓
Nickel			✓	✓	✓
Zinc				✓	

Source: AFC Appendix Table 8.1A-3 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993

In addition to the substances identified in **PUBLIC HEALTH** Table 2, untreated wastewater contains various levels of pathogenic organisms, such as viruses and bacteria. If the wastewater is not treated to reduce the numbers of these organisms, they could be released to the atmosphere in the cooling tower drift at levels that could affect public health.

The California Department of Health Services (DHS) is proposing to regulate the use of recycled water in cooling towers under Title 22 of the California Code of Regulations (proposed section 60306). When recycled water is used in a cooling tower that creates a mist, the regulations would require the following:

- The recycled water used must be disinfected tertiary recycled water (DTRW).
- A drift eliminator shall be used whenever the cooling system is in operation.
- A chlorine, or other biocide, shall be used to treat the recirculating water to minimize the growth of *Legionella* and other micro-organisms.

Disinfected Tertiary Recycled Water

The proposed regulations define DTRW as a filtered and subsequently disinfected wastewater and specify the degree of disinfection required or the final allowable concentrations of pathogens (e.g., 99.999 percent reduction of virus and mean concentration of coliform bacteria not exceeding 2.2 per 100 milliliters) (section 60301.230). Water meeting these standards is also allowed by the proposed regulations to be used for irrigating food crops, parks and playgrounds, school yards, and residential landscaping.

As noted above, the source for MEC cooling water will be San Jose's SBWR Program. SBWR water is provided by the San Jose/Santa Clara Water Pollution Control Plant (WPCP), an advanced tertiary treatment facility which produces water treated to the proposed Title 22 standards for unrestricted use. The advanced tertiary treatment facilities include nitrification, filtration, and chlorine disinfection. The WPCP, in accordance with the proposed standards, samples the recycled water daily for various analyses and provides water which routinely surpasses Title 22 standards (e.g., coliform bacteria counts typically less than 1.0 per 100 milliliters, compared to the proposed Title 22 standard of 2.2).

Several studies have examined and confirmed the effectiveness of treatment processes conforming to Title 22 requirements in reducing pathogens to safe levels.

The Monterey Wastewater Reclamation Study for Agriculture (spanning eleven years from planning and design in 1975 to final project reporting in 1986) examined the safety of irrigating raw-eaten vegetables with recycled water (Sheikh, et al. 1998a). That study found that aerosols generated from sprinkler irrigation did not contain microorganisms of wastewater origin (Sheikh, et al. 1998a, p. 802). Further, during the five-year period of field studies, no in situ viruses were recovered from the treated effluent comprising 114 samples with a volume of over 186,000 liters (Sheikh, et al. 1998a, p. 803).

A follow-up to the Monterey study was conducted in 1997 to determine if additional water-borne pathogens capable of producing gastrointestinal diseases were present in recycled water (Sheikh, et al. 1998b). This more recent study did not detect any of the bacteria *Salmonella*, *Cyclospora*, *E. coli*, or *Legionella*; or the protozoans

Giardia or *Cryptosporidium* in the recycled water (Sheikh, et al. 1998b, Table 4, p. 6).

The County Sanitation Districts of Los Angeles County operate seven tertiary filtration plants for water reuse. During a ten-year virus monitoring period from 1979 to 1989, only one virus was isolated from samples testing more than 100,000 gallons of disinfected tertiary effluent (Chen et al. 1998, p. 258).

Drift Eliminators

The MEC project will use high efficiency drift eliminators which limit the amount of drift loss to approximately 0.0005 percent of the circulating water rate, resulting in a drift rate of about 0.7 gallon per minute (Calpine/Bechtel 2000b, Table 8.1A-5). This amount of water lost as liquid from the cooling towers is in contrast to the amount of water evaporated as steam, estimated to be from 1,500 to 2,500 gallons per minute, depending on ambient temperatures (Calpine/Bechtel 1999a, AFC Figures 2.2-6a,b). Steam emitted from the cooling towers is distilled water, and will not contain contaminants.

The drift eliminators must be properly installed and maintained in order to achieve efficient operation over the life of the facility. Following installation, proper maintenance includes periodic inspection and repair or replacement of any components found to be broken or missing. Calpine/Bechtel have proposed language for a Condition of Certification for the inspection and maintenance of drift eliminators. Staff has incorporated this language in proposed Condition of Certification Public Health -1.

Cooling Water Treatment

As noted above, water from the WPCP is disinfected using chlorine to reduce pathogenic organisms. Additional routine water treatment with chlorine at MEC is required during use to minimize bacterial growth, corrosion, and formation of mineral scale. MEC will employ an automated chemical feed system to supply conditioning chemicals (sulfuric acid, organic phosphate, and sodium hypochlorite) to the cooling water (Calpine/Bechtel 1999a, AFC p. 2-9). The system will continuously monitor several water parameters and provide real time data to the plant operators, as well as alarm enunciation if specified levels are exceeded (Calpine/Bechtel 1999h, data response #66). Such routine water treatment also serves to minimize conditions which are conducive to the growth of pathogenic organisms such as *Legionella* bacteria. These include the presence of other microorganisms which contribute nutritional factors, stagnant water or low flow conditions, the presence of corrosion, scale, and accumulations of sludge and sediment.

EMISSIONS LEVELS

Once potential emissions are identified, the next step is to quantify them by conducting a “worst case” analysis. Maximum hourly emissions are required to calculate acute (one hour) noncancer health effects, while estimates of maximum missions on an annual basis are required to calculate cancer and chronic (long-term) noncancer health effects.

MEC expects that the diesel fire pump will be powered by a 300 horsepower engine with a PM10 emission rate of 0.165 lb/hr (Calpine/Bechtel 2000c, p. 5). Although weekly tests are expected to last about 30 minutes, modeling was performed assuming that the engine will operate for one hour for testing and up to 100 hours annually.

AFC Table 8.1-15 shows maximum hourly and annual fuel use for the gas turbines, duct burners, and auxiliary boilers. The maximum fuel use is combined with the emission factor for each toxic air contaminant to estimate hourly and maximum annual emissions (Calpine/Bechtel 1999a, AFC Appendix 8.1A, Table 8.1A-3). Emission factors are estimates of the amounts of toxic substances released per unit of fuel burned and are from data compiled by the Ventura County Air Pollution Control District and the California Air Toxic Emission Factors database maintained by the California Air Resources Board (Calpine/Bechtel 1999a, AFC p. 8.1-26).

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The screening analysis was performed using the U.S. EPA approved ISCST3 dispersion modeling program (please see staff's **Air Quality** section for a detailed discussion of the modeling methodology). Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects which might occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Revised 1992 Risk Assessment Guidelines (October 1993) referred to earlier, and results in the following health risk estimates.

NONCANCER HAZARD

Construction

Maximum construction impacts typically occur near the project because emission points are close to the ground, limiting dispersion. Due to the relatively short period of construction, only acute (short-term) health impacts are examined. The modeled one-hour maximum concentration of 81.79 $\mu g/m^3$ was found to occur near the northern fenceline of the project. Areas where the one-hour concentrations are predicted to exceed the 50 $\mu g/m^3$ acute REL as derived above are the uninhabited areas north and east of the proposed site. The modeled one-hour concentration at the nearest residential receptor is 46.65 $\mu g/m^3$, which is below the REL of 50 $\mu g/m^3$.

Operation

The health risk assessment for diesel emissions from the fire pump engine resulted in a maximum acute hazard index of 0.24 and a chronic hazard index of less than .001 at the nearest residence. The fire pump engine cancer risk at the nearest residence was 0.89 in one million, less than the one in one million level staff considers de minimus.

The screening health risk assessment for the project, including combustion and noncombustion emissions, resulted in a maximum acute hazard index of 0.33 about 0.9 miles northwest of the proposed site. The chronic hazard index at the point of maximum impact is 0.06. The location of the maximum chronic hazard is about one-half mile west and slightly north of the proposed site (Calpine/Bechtel 2000b, Figure 8.1D-1). Both acute and chronic hazard indices are under the REL of 1.0, indicating that no short- or long-term adverse health effects are expected.

PUBLIC HEALTH Table 3
Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level
Acute Noncancer	0.33	1.0
Chronic Noncancer	0.06	1.0
Individual Cancer	0.2×10^{-6}	1.0×10^{-5}

Source: Calpine/Bechtel 2000b, Table 3.6-1.

CANCER RISK

As shown in **PUBLIC HEALTH** Table 3, total worst-case individual cancer risk is estimated to be 0.20 in one million. As discussed earlier, this is the risk at the location where long-term pollutant concentrations are calculated to be the highest, and is at the same location as the maximum chronic hazard (Calpine/Bechtel 2000b, Figure 8.1D-1). At the nearest residence where modeled risk from the diesel fire pump is 0.89 in one million, maximum facility risk was modeled to be 0.02 in one million (Calpine/Bechtel 2000c, p. 6). Thus, maximum risk from both sources is 0.91 in one million at that location.

CUMULATIVE IMPACTS

The BAAQMD estimated the lifetime cancer risk for inhalation of ambient air (from all sources) to be 194 in one million based on 1997 average toxic concentration data (BAAQMD 1998, p. 3).

The maximum cancer risk for the MEC facility is 0.2 in one million, less than the level of one in one million which staff considers de minimus. This represents a maximum risk at the particular location where pollutant concentrations from MEC would theoretically be the highest. Even at this location, staff does not expect any change in lifetime risk to any person, and the increase does not represent any real contribution to the ambient risk of 194 in one million. Facility-related risks are lower at all other locations, and actual risks are expected to be much lower, since worst-case impacts are based on conservative assumptions, and overstate the true

magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the additional risk posed by the MEC project to be either significant or cumulatively considerable.

The worst-case long-term health impact from MEC (0.06 hazard index) is well below the significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term hazard would be lower at all other locations, and cumulative impacts at other locations would also be less than significant.

BAAQMD staff examined the issue of cumulative impacts from facilities affecting the same neighborhood (BAAQMD 1993). They concluded that elevated concentrations of toxic air contaminants from stationary sources tend to be quite localized, and that cumulative risks are likely to occur only when multiple facilities with substantial low-level emissions are immediately adjacent to, or very close to, one another.

Even in the unlikely event that worst-case emissions from an existing facility were to coincide both geographically and temporally with MEC emissions at the location of maximum impact, the overall long-term health outlook would not change for anyone. Thus, the MEC project will not result in any significant cumulative cancer or chronic noncancer health impacts.

FACILITY CLOSURE

As noted in the introduction to this section, the scope of staff's public health analysis is limited to routine releases of harmful substances to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or nonroutine releases from either hazardous materials or wastes which may be onsite. These are discussed in the sections on **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

MITIGATION

Excavation at the site or linear facilities could disturb contaminated soil that may require mitigation measures to prevent potential public health impacts. Staff has proposed adoption of a condition of certification in the **Waste Managem**ent section which requires the project owner to have an environmental professional on site to inspect locations where potentially contaminated soil is found, determine the need for future action, and potentially contact appropriate agencies for possible oversight.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the MEC project will be in compliance with all applicable LORS regarding long-term health impacts, but additional information is required regarding short-term project impacts.

CONCLUSIONS AND RECOMMENDATIONS

Staff has analyzed potential public health risks associated with construction and operation of the MEC project. With implementation of the condition of certification included herein, as noted, staff does not expect there to be any significant adverse cancer, or short- or long-term noncancer health effects from project emissions

CONDITION OF CERTIFICATION

PUBLIC HEALTH-1 The project owner shall perform a visual inspection of the cooling tower drift eliminators once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to initial operation of the project, the project owner shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminator and certify that the installation was performed in a satisfactory manner. The CPM may, in years 5 and 15 of project operation, require the project owner to perform a source test of the PM_{10} emissions rate from the cooling tower to verify continued compliance with the vendor guaranteed drift rate.

Verification: The project owner shall include the results of the annual inspection of the cooling tower drift eliminators and a description of any repairs performed in the next required quarterly compliance report. The initial compliance report will include a copy of the cooling tower vendor's field representative's inspection report of the drift eliminator installation. If the CPM requires a source test as specified in Public Health-1, the project owner shall submit to the CPM for approval a detailed source test procedure 60 days prior to the test. The project owner shall incorporate the CPM's comments, conduct testing, and submit test results to the CPM within 60 days following the tests.

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WORKER SAFETY AND FIRE PROTECTION

Testimony of Kathi Hann

INTRODUCTION

Worker safety and fire protection is legislated by laws, ordinances, regulations, and standards (LORS), and enforced through regulations codified at the Federal, State, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Industrial workers at the facility operate process equipment and handle hazardous materials daily, and may face hazards which can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment or procedural controls.

The purpose of this analysis is to assess the worker safety and fire protection measures proposed by Calpine Corporation and Bechtel Enterprises, Inc. for the Metcalf Energy Center (MEC). Staff has reviewed both the original Application for Certification (AFC) (April, 1999), the October 1, 1999 AFC Supplement A, and the October 15, 1999 AFC Supplement B to determine whether MEC 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
- provide adequate emergency response procedures.

Staff has determined that the features of the proposed project, in association with the proposed worker safety plans and procedures, will, for the most part, comply with applicable LORS and minimize the exposure of workers to industrial accidents or hazards. However, issues relating to the adequacy of the local fire district's fire protection service capabilities, and appropriate mitigation for any deficiencies identified, have not yet been resolved. They will be addressed further in the Final Staff Assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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 feder
al 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. 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 (Calif. 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 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 (Calif. 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 Calif. § 874 and Calif. 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 required that employers establish and maintain a written Injury and Illness Prevent 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, 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 the United State's premier model fire code. 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

Calpine Corporation and Bechtel Enterprises, Inc. propose to jointly develop the MEC into a natural gas-fueled power plant at the southern edge of the City of San Jose in Santa Clara County. The MEC will be a merchant plant not owned by a utility but producing and selling energy into California's newly deregulated electricity market.

The proposed MEC site will occupy about 14 acres and is located about 11 miles southeast of downtown San Jose, between Monterey Road and Santa Teresa Boulevard, south of Metcalf Road. The site is separated from urban San Jose by Tulare Hill. MEC's proposed power plant, transmission line connector, and gas line will be sited at t the northern end of the Coyote Valley. The City of San Jose has designated this portion of the Coyote Valley as a campus industrial park, formally named the North Coyote Valley Campus Industrial Area. Cisco Systems is also proposing development in this area of a 400-acre headquarters complex. Historically, urban development has been restricted in the Coyote Valley by public policies to preserve its rural character. Within the last several decades, however, the City of San Jose has set aside the northern Coyote Valley for large single user sites where major companies can consolidate their operations.

Although the MEC site is formally within the South Santa Clara County Fire District's Jurisdiction, the City of San Jose Fire Department (SJFD) generally provides service to county pockets that are surrounded by city lands, such as the MEC site.

SJFD Fire Station 27, as shown on **WORKER SAFETY AND FIRE PROTECTION Table 1**, is presently the closest station to the MEC site. It is located near Santa Teresa Park in San Jose and would provide the initial emergency response, having a response time of 7 minutes to the MEC site. SJFD Station 12, also located in San Jose with a response time of 12 minutes, would provide back-up support. Two other stations in San Jose, Stations 18 and 29, will provide additional back-up support with eight Type 1 engines, ten fire trucks, a light unit, and a water tender between them. In addition to fire response capabilities, these fire stations have first responder HAZMAT capabilities. "First responders at the operations level are

individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property or the environment from the effects of the release (Title 29, Code of Federal Regulations 1910.120)."

In the event of a sustained hazardous materials release, the SJFD's Hazardous Incident Team (HIT Unit) will provide response support. The HIT Unit is located at SJFD Station Number 29 at 199 Innovation Drive in north San Jose. Response time is in excess of 30 minutes to the MEC site. (See the **Hazardous Materials Section** for more detail.)

WORKER SAFETY AND FIRE PROTECTION Table 1 provides an outline of the equipment and personnel at each fire station. Following is a general description of the response equipment listed:

The Fire Engine is a primary response unit. It has a 600 gallon water tank, a minimum of 1,500 gallon per minute (gpm) pump, 2,400 feet of hose and a advance life support (ALS) medical response unit.

- Fire Trucks are also primary response units, and have a 500-gallon water tank, a 1,250-gpm pump, 1,000 feet of hose and an aerial ladder with stream capability of 1000 gpm.
- Brush Patrol is primarily used for fighting wild fires such grass fires. Each consists of a 265-gallon water tank, 150 gpm-water pump, and comes with 4-wheel drive.
- Water Tender has a 1,250-gallon water supply, a 500-gpm pump, and an auxiliary 2,000-gallon folding tank.
- Light Unit consists of a 20 kw generator and lighting capability for night operations and for use with rescue equipment on fire truck.

WORKER SAFETY AND FIRE PROTECTION Table 1
Fire Station/Fire Protection Capabilities

Station	Response time	Equipment (personnel per vehicle listed in parenthesis)	Number of Firefighters
Station 27 239 Bernal Road near Santa Teresa Park (408) 277-8900	Approximately 7 minutes	1 – Type 1 Engine (4) 1 – Type 4 Brush Patrol	4
Station 12 502 Calero Avenue San Jose (408) 277-4612	Approximately 12 minutes	1 – Type 1 Engine (4) 1 – Type 4 Brush Patrol	4
Station 18 Intersection of Monterey Road and Skyway Avenue (408) 277-4618	Approximately 12-15 minutes	1 – Type 1 Engine (4) 1 – Fire Truck (5) 1 – Light Unit 1 – Water Tender	9
Station 29 199 Innovation Drive (408) 277-4629	Greater than 30 minutes	1 – Type 1 Engine (4) 1 – Fire Truck (5) HIT Unit (4)	14

IMPACTS

PROJECT SPECIFIC IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous, both during construction and operation of facilities. Workers at the proposed MEC project will be exposed to loud noises, electrocution, chemical spills, hazardous waste, fires, explosions, moving equipment, falling equipment or structures, trenches, confined space entry and egress problems; and may experience falls, trips, burns, lacerations and numerous other injuries. It is important for MEC to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers.

FIRE HAZARDS

During construction and operation of the proposed MEC facilities, there is the potential for both incipient (small) fires and major structural fires. Incipient fires may be caused by electrical sparks, combustion of fuel oil, natural gas or flammable

liquids, explosions, and over-heated equipment. Major structural fires may develop from uncontrolled incipient fires or be caused by large explosions of natural gas or other flammable gasses or liquids.

CUMULATIVE IMPACTS

The worker safety and fire hazards associated with the proposed construction and operation of the MEC, as well as the proposed CISCO development in the North Coyote area, which are being permitted by San Jose County, will result in a significant cumulative impact on the fire protection and emergency service capabilities of the city and county Fire Departments.

MITIGATION

MITIGATION OF DIRECT IMPACTS

WORKER SAFETY

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 proposed MEC 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) will 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 MEC, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-1**. During construction, a hazard analysis will be performed to evaluate the hazards and develop appropriate programs/plans to address any hazards that are not included above.

OPERATION SAFETY AND HEALTH PROGRAM

Upon completion of construction and prior to operations at MEC, the Operations Safety and Health Program will be prepared pursuant to regulatory requirements of Title 8 of the California Code of Regulations MEC'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) will 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 MEC, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-2**.

SAFETY AND HEALTH PROGRAM ELEMENTS

MEC 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)

MEC will submit an expanded Construction and Operations Illness and Injury Prevention Programs to Cal/OOSHA for review and comment 30 days prior to both construction and operation of the project.

The IIPP will include the following components as presented in MEC outline:

- 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 the IIPP as the result of an onsite consultation at MEC's request. 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/OHA an opportunity to evaluate MEC'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 MEC 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 MEC 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 AFC contains a draft proposed fire prevention plan which is acceptable to staff. The Construction and Operations Fire Prevention Plans, which are required to be developed by staff's recommended conditions of certification **WORKER SAFETY-1 AND 2**, will need to include the following topics:

- 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 MEC 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 stipulate that Personal Protective Equipment (PPE) and first aid supplies are required whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). MEC's operational environment will likely require PPE.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program. MEC provided a satisfactory outline that identifies minimum requirements of a proposed PPE program.

The components of MEC's program as outlined 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 life lines for fall protection
- Protection for electric shock
- Medical services and first air/ bloodborne pathogens
- Respiratory protective equipment
- Hearing protection
- Training

Staff evaluated MEC's outline and assessed that the proposed PPE Program contains the elements that will meet applicable regulations and will significantly reduce the potential impact upon workers.

General Safety

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs are presented in the following paragraphs.

Motor Vehicle and Heavy Equipment Safety Program

This program concerns the operation and maintenance of vehicles, inspections, personal protective equipment and traffic safety training for employees working on, near, or with heavy equipment or vehicles. A safe driving training program will be included in the operations safety program.

Forklift Operation Program

Forklift operation will utilize only trained and certified operators. The training program will include safe fueling procedures and forklift driving.

Evacuation/Trenching Program

A Cal/OSHA permit is required for certain trenches, excavations, structures, scaffolding and dismantling. MEC'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 evaluate the appropriate protection devices, such as safety harnesses.

Scaffolding / Ladder Safety Program

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

Articulating Boom Platforms Program

This program consists of:

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

Crane and Material Handling Program

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

- Inspection of equipment
- Load ratings
- Safe operating parameters

Hot Work Safety Program

Hot work is that which causes a spark and can ignite a fuel source, such as welding, cutting and brazing. Before proceeding with hot work, workers will request a work authorization for the project's assigned Safety Officer. The control operator, shift

supervisor will determine if hot work is required. Before proceeding, the area will be inspected and the job posted. MEC'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 includes:

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

Electrical Safety Program

MEC'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 Sections 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. Lockout is the placement of a padlock, blank flange, or similar device on equipment to ensure it will not be operated until the lockout device is removed. Tag-out procedures utilize warning signs that caution personnel when equipment can't be energized until the lockout device is removed. Warning signs are used to alert employees to the presence of hazardous and toxic materials. MEC'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 minimal standards for preventing employee exposure to dangerous air contaminants and/or oxygen deficiency in confined spaces, where there is an oxygen-deficient atmosphere, a limited means of egress, or a source of toxic of flammable contaminants (8 CCR Sections 5156-5168). Confined spaces include silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. MEC included an outline of their permit-required confined space entry program, which 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, site 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 available under hazardous conditions.

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.

Housekeeping and Material Handling and Storage Program

This program concerns storage requirements and proper handling of equipment, and keeping walkways and work surfaces clean and safe. Worker training includes good housekeeping practices.

Hearing Conservation Program

This program identifies high-noise environments and assigns hearing protective devices appropriate to the noise level. Although hearing protection is included in personal protective equipment, this program includes exposure monitoring and medical surveillance, along with worker training.

Back Injury Prevention Program

Worker training in this program will consider 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, MEC 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. MEC will train workers to under 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

Respiratory protection is also incorporated in the personal protective equipment. This program includes:

- 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 includes monitoring, prevention and control for workers in hot or cold environments.

Pressure Vessel and Pipeline Safety Program

Workers at pressure vessels and pipelines will be trained in the following procedures:

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

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (MEC Section 8.8.1.7.2 Fire Protection), to determine if the project would adequately protect workers and if it would impact the fire protection and emergency response services of the Fire Department. The project will rely on both onsite fire protection systems and Fire Department's fire protection and emergency response services.

The information in the AFC indicates that the proposed fire protection system at the site will be adequate for fighting incipient fires, and that fighting major structural fires will require the services of the Fire Department. The proposed fire protection system at the site includes fire alarms, detection systems, fire hydrants, and hose stations throughout the facility. Fixed fire suppression systems will be installed at determined fire risk areas, such as the transformers, turbine lubrication oil equipment, and cooling tower. The facility fire mains will also supply a vapor suppression system at the aqueous ammonia storage tank area. 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 be required to provide final diagrams and plans to staff and to the District, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures. 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.

Major structural fires and hazardous materials releases will require the services of the Fire Department. Unfortunately, none of the nearby stations have a response time that meets the acceptable travel time established by the City of San Jose Fire Department of 4-6 minutes. The first responder (Station 27) is at least 7 minutes away and the second (Station 12) is 12 minutes away. Furthermore, the HIT Unit (Station 29) response time is well in excess of 30 minutes. Planned development by Cisco Systems to develop a headquarters complex on a 400-acres portion of lands in the North Coyote Valley Campus industrial area will accommodate 20,000 additional jobs and require development of an infrastructure which will be planned, funded, and constructed by an assessment district created by the City of San Jose. This increased development within these districts will further limit fire protection services, which will be poor for both the MEC project and the proposed Cisco complex due to the distribution of the existing stations and the increasing workload.

In a letter to the California Energy Commission (August 18, 1999), the City of San Jose Fire Department indicated that the project will cause significant impacts to their service capabilities (King, January 7, 2000). The letter explains that the AFC does not address the Fire Department's increasing workload by station companies under existing conditions. The Fire Department stated that the development of the MEC project will initiate the need for a new fire station and staffing, with a minimum of one engine and truck company. Additionally, the MEC project will require additional water main distribution lines, public water lines, public (off-site) and private (onsite) fire hydrants and other building requirements pursuant to the Uniform Fire Code.

Staff have recommended to the Fire Department that the costs for building and staffing a new station and associated equipment be shared among all project owners who are planning development in the North Coyote Valley. Staff has proposed a condition of certification **WORKER SAFETY-4** to assure that the MEC's impacts to the Department's fire and emergency service capabilities will be mitigated in this manner.

MITIGATION OF CUMULATIVE IMPACTS

The worker safety protection programs being proposed by MEC will be applicable to the construction and operation of the MEC facility and will provide adequate protection for workers at that facility. Staff's recommended condition of certification **Worker Safety-4** will ensure that the MEC's contribution to cumulative impacts to the Fire Department's fire protection and emergency service capabilities will be adequately mitigated. This condition will also help meet the fire protection needs of other planned development projects such as the proposed CISCO expansion.

FACILITY CLOSURE

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

CONCLUSIONS

If MEC provides a (1) Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification **WORKER SAFETY 1** and **2;** (2) the plans of the automatic fire extinguishing system, fire alarm system and detailed architectural plans to the Fire Department for review and approval, as required by condition of certification **Worker Safety-3**; and (3) provides funding for additional fire protection services capabilities as required in condition of certification **Worker Safety-4,** staff believes that the project will incorporate sufficient measures to ensure adequate levels of worker safety and fire protection, and comply with applicable LORS.

RECOMMENDATIONS

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

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 of San Jose 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, incorporating Cal/OSHA's Consultation Service comments. The project

owner shall provide a letter from the San Jose 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
- an 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 Fire Protection Plan and the Emergency Action Plan shall be submitted to the San Jose Fire Department for review and acceptance.

Verification: 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. It shall incorporate Cal/OSHA's Consultation Service 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.

WORKER SAFETY-3 The project owner shall submit automatic fire extinguishing system plans, fire alarm system plans, and detailed architectural plan(s) to the San Jose Fire Department for review and approval before beginning construction.

Protocol: Automatic fire extinguishing system plans, fire alarm system plans, and detailed architectural plan(s) shall be submitted to the City of San Jose Fire Department, for review and approval.

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 letter from the City of San Jose Fire Department stating that they have received, reviewed and approved the automatic fire extinguishing system plans, fire system alarm plans, and detailed architectural plans.

WORKER SAFETY-4 At least 60 days prior to any ground disturbance, the project owners and the owners of Cisco Systems shall reach an agreement with the San Jose Fire Department on the amount of fees and timing of payment they will provide to cover project-specific impacts associated with fire protection and the additional fire station, staffing, one engine and truck; and requirements for water main distribution lines, public water lines, public (off-site) and private (onsite) fire hydrants.

Verification: Not later than 30 days prior to any ground disturbance, the project owner shall provide the CPM with a copy of an agreement with the San Jose Fire Department and the owners of the MEC for funding of the station, staff and equipment.

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TRANSMISSION LINE SAFETY AND NUISANCE

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INTRODUCTION

The energy generated at the proposed Metcalf Energy Center (MEC) will be transmitted into the existing PG&E power grid through a new 200-foot 230 kV overhead transmission line within the route shown in **PROJECT DESCRIPTION Figure 5.** The route was chosen to minimize the length of new line necessary to transmit the generated energy into the power grid. The purpose of staff's analysis is to assess this proposed line design for measures necessary to prevent possible health and safety hazards, as described by Calpine/Bechtel (1999a, AFC pages 5-7 through 5-15). Such hazard prevention is accomplished through compliance with laws, ordinances, regulations and standards (LORS) identified by Calpine/Bechtel as applicable to the proposed project (Calpine/Bechtel 1999a, AFC pages 5-15 through 5-18). The assessment will evaluate the following issues, which relate primarily to the physical presence of the line, or secondarily to the physical interactions of line electric and magnetic fields, as will be discussed later:

- 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)

Discussed below by subject area are design-related LORS applicable to the physical impacts of transmission lines as proposed for MEC. 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 one proposed for MEC. 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 lines of the type proposed, the applicant will be 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, Section 2700 et seq., "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 of electric fields 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 both as EMF exposure. As noted by Calpine/Bechtel (1999a, AFC page 5-9), 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 to some degree, where feasible, until the issue is better understood. The challenge has been to establish when, and how far to reduce them.

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.

Several regulations have been established to control human exposure.

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 PUC 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 in ways, and to an extent, 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

According to information from Calpine/Bechtel (1999a, AFC pages 5-1 through 5-5), the proposed power plant is adjacent to a wide PG&E transmission line right-of-way that accommodates five transmission lines of 115 kV, 230 kV and 500 kV. These lines connect to the nearby PG&E Metcalf Substation. It is the closest of these circuits, the 230 kV Monte-Vista No. 4 transmission line, to which the proposed power line will be connected. When power flows into the PG&E grid from the proposed MEC, it will increase or reduce the amount flowing within the other lines (along with the related magnetic fields), depending on the operative dispersion pattern. At 200 feet, the proposed line will be short compared to the lines within the existing corridor which extend over 31 miles from the point of connection to the next substation, the Monta-Vista Substation. The line's field impacts could be considered in terms of field strengths within the 200-foot route and contribution along the existing 31-mile corridor. Contribution within this corridor will be reflected by field strength changes at the maximum impact point for fields from the proposed MEC line and the other lines in the corridor.

As discussed by Calpine/Bechtel (1999a, AFC pages 5-12 and 8.4-6), the proposed route will traverse an area of primarily vacant land and agricultural land along its 200-foot route. The interconnection point will be approximately 250 feet from Monterey Road, the nearest area of potential public exposure; this PG&E corridor crosses Monterey Road immediately northwest of the interconnection point. The nearest residence to the interconnection point along the Monterey Road will be more than 1,500 ft away. This means that long-term residential magnetic field exposure would be minimal. Any exposure of potential concern would be limited to line workers and individuals in transit across the right-of-way.

PROJECT DESCRIPTION

The proposed transmission line will consist of the components listed below:

- a double circuit 230 kV overhead line approximately 200 feet from MEC to the existing Metcalf/Monta Vista No. 4 PG&E transmission line; and
- a new 230 kV switchyard at the MEC.

The line will extend from two 70 ft tall H-shaped take-off support structures within the new MEC switchyard to the Metcalf/Monte Vista No. 4, 230 kV transmission line, where it will be connected to the line's 174-ft tower (Calpine/Bechtel 1999a, AFC page 8.11-15). These take-off structures will be spaced approximately 50 feet apart. Details of these structures and the interconnection point have been provided by Calpine/Bechtel. The route of the line will exit MEC to the north, and immediately cross a small stream, Fisher Creek, to the north as it joins the existing

PG&E transmission corridor to the north (Calpine/Bechtel 1999a, AFC page 5-4). Since the proposed line will be connected to an existing PG&E line, it will be constructed with the same type of conductor used in the PG&E line. The field-reduction measures to be applied are specified in PG&E's field reduction guidelines for lines of this type (Calpine/Bechtel 1999a, AFC pages 5-8 and 5-12 and 5-13). Calpine/Bechtel have provided the details of their EMF reduction approach as specified in these guidelines.

IMPACTS

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 avoid 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 magnetic 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

The MEC site is proposed for a location with no major airports in its immediate vicinity. As noted by the Calpine/Bechtel (1999a, AFC page 5-15), the closest airfield is Canyon Creek Heliport at Morgan Hill, 7.2 nautical miles southwest of the MEC. The next closest airport is Reid-Hillview Airport in San Jose, 7.6 miles northwest of MEC. An FAA "Notice of Construction or Alteration" will not be required for the proposed power line, 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. From its consideration of all issues related to distance from the line and FAA safety requirements, staff is in agreement with the applicant that the proposed line will not pose a significant hazard to area aviation.

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. Calpine/Bechtel's intended use of a low-corona conductor

design and construction methods (Calpine/Bechtel 1999a, AFC pages 5-14 and 5-15) 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 230 kV line to which the proposed line will be connected. This is as staff would expect for this type of line. 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. Staff has proposed a condition of certification **(TLSN-2)** to ensure mitigation of any interference-related complaints on a case-specific basis, as required by the FCC. **TLSN-1** is also proposed by staff to ensure compliance with GO-52, also intended to prevent radio interference.

AUDIBLE NOISE

As with radio noise, the low-corona conductor proposed for the MEC line and currently used in the 230 kV line to which it will be connected, will minimize the potential for audible noise. This means, as noted by Calpine/Bechtel (1999a, AFC page 5-15), that the line will not add significantly to existing background noise levels in the 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

According to Calpine/Bechtel, adequate fire prevention and suppression measures will be implemented in the area around the proposed line as required by related regulations and industry practices (Calpine/Bechtel 1999a, AFC page 5-15). Compliance with GO 95 requirements will ensure the clearance necessary to prevent fires from direct contact between the proposed line, trees and other objects. Compliance with condition of certification **TLSN-4,** as staff proposes, will prevent accumulation of combustible materials that could contribute to such fires.

HAZARDOUS SHOCKS

Calpine/Bechtel has stated their intention to comply with the requirements of GO-95 intended to prevent hazardous shocks from direct or indirect human contact with the overhead energized line. Therefore, they do not expect the proposed line to pose any such hazards to humans (Calpine/Bechtel 1999a, AFC page 5-8). Staff does not expect such a hazard from the line as proposed and recommends a condition of certification (**TLSN-1)** to ensure implementation of the necessary GO-95-related measures.

NUISANCE SHOCKS

Calpine/Bechtel intends to minimize the potential for nuisance shocks by ensuring the grounding of all metallic object within or near the right-of-way way as with the same-voltage line to which it will be connected (Calpine/Bechtel 1999a, AFC page 5-14). Ensuring GO-95-required ground clearance, as intended by Calpine/Bechtel (1999a, AFC page 5-13), will minimize the potential for the electrical charging for which such grounding would be necessary. Staff recommends a specific condition of certification (**TLSN-5**) to ensure the necessary grounding.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

Calpine/Bechtel intends to implement PG&E's EMF reduction measures arising from CPUC Decision 93-11-013. Staff is satisfied with the related details as provided by Calpine/Bechtel along with the underlying design assumptions (Calpine/Bechtel 1999a, AFC pages 5-12 through 5-14). Calpine/Bechtel also calculated the maximum field strengths at the interconnection point of maximum impact to reflect the maximum contribution of the proposed line to total field strengths, as contributed by the proposed line and the other five lines within the existing corridor. This calculation was made to reflect the interactive effects of fields from the proposed line and the other lines. The results show that the proposed line design will not contribute significantly to existing electric or magnetic field levels within the PG&E right-of-way through which the MEC power will be transmitted. Staff has established the appropriateness of Calpine/Betchel's calculation approach with respect to parameters bearing on field strength and dissipation, and exposure assessment.

Specifically, Calpine/Bechtel's calculations show that line operations will not change the existing field strength of .075 kV/m at the edge of the left side and the 2.044 kV/m on the right side of the right-of-way. For magnetic fields, the existing strength of 5.381 mG at the south side of the-right-of way will increase to 5.847 mG under conditions of maximum impact. However, line operations will reduce field strengths on the northern side from about 40.728 mG to 32.656 mG because of a corresponding reduction in system power flow through the 500 kV line on the northern side of the right-of-way.

As previously noted, the most important human exposures in the line's impact area will be the short-term exposures to utility workers in the course of their duties around the line and individuals in transit across the right-of-way. Such short-term exposures are well understood, being significantly lower than exposures from the use of common household appliances, such as hair dryers, toaster ovens, microwave ovens and electric shavers. They are not known to have produced any significant health impacts in the past. Staff has recommended condition of certification **TLSN-3** to verify that the fields are reduced to the extent proposed by Calpine/Bechtel. Condition of certification **TLSN-5** is proposed to ensure the measures necessary to prevent any field-related nuisance shocks along the route.

CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from the proposed line were calculated to factor the interactive effects of fields from nearby 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 line. They are typical of similar lines within the PG&E service area.

CONCLUSIONS AND RECOMMENDATIONS

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 PG&E 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 MEC line. Any nuisance shocks from the lines will be minimized through grounding and other measures to be implemented by Calpine/Bechtel in compliance with GO-95, Title 8, Section 2700 et seq. of the California Code of Regulations, and the applicable PG&E field-reducing guidelines. Since the line 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 line will be designed according to the applicable safety and field-reducing guidelines, and routed over a relatively short distance to the existing power grid, staff recommends its approval for the route 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 Calpine/Bechtel for the line design.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E'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, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF reduction measures arising from CPUC Decision 93-11-013.

TLSN-2 The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the line and related facilities. In addition to any transmission repairs, the relevant corrective actions should include,

but shall not be limited to, adjusting or modifying receivers, repairing, replacing or adding antennas, signal amplifiers, filters, or lead-in cables.

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action, or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action. The complaint form specified under the General Conditions of Certification shall be used for this purpose.

Verification: All reports of line-related complaints shall be summarized and included for five years in the Annual Compliance Report to the CPM.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields in the project owner's 200-ft section before and after the 230 kV line is energized. Measurements should be made at the same point for which field strength values were presented by Calpine/Bechtel in the AFC. Measurements should also be made to identify the electric and magnetic fields from the line in the area along the route away from the influence of fields from the other five lines within the existing PG&E corridor. 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.

TLSN-4 The project owner shall ensure that the transmission line right-of-way is kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations.

Verification: The project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way, for five years, in the annual compliance report.

TLSN-5 The project owner shall ensure the grounding of any ungrounded permanent metallic objects within the right-of-way of the overhead section, regardless of ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.
Protocol:
Protocol: Protocol: In the event of a refusal by any property owner to permit such grounding, the project owner shall so notify the CPM. Such

notification shall Include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 30 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

REFERENCES

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Energy Commission Staff 1992. High Voltage Transmission Lines: Summary of Health Effects Studies. California Energy Commission Publication, P700-92-002.

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HAZARDOUS MATERIALS MANAGEMENT

Rick Tyler

INTRODUCTION

The purpose of this analysis is to determine if the proposed Metcalf Energy Center (Calpine/Bechtel, 1999a) 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. Employers must inform employees of hazards associated with their work and thus employees accept a higher level of risk than the general public as a condition of employment. Workers are thus not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials (see staff's **Worker Safety and Fire Protection** analysis).

The only hazardous material proposed for use at the MEC in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia. The use of aqueous ammonia significantly reduces the risk that would 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 elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release which can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain and emissions are limited by the slow mass transfer from the free surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, 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. The natural gas pipeline is addressed in staff's **Facility Design** analysis.

The MEC will also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed in staff's **Traffic and Transportation** analysis.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

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. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

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).

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.

Title 8, California Code of Regulations, Section 458 and Sections 500 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

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

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 (Calpine/Bechtel 1999a, AFC Chapter 8.1). This data indicates that wind speeds below one meter per second and temperatures exceeding 80°F can occur in the project area. Therefore, staff suggested that the applicant use F stability (stagnated air, very little mixing), one meter/second wind speed and an ambient temperature of 80° 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. Additional modeling of more likely accident scenarios and more realistic meteorological conditions were also evaluated.

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. Thus, elevated terrain is not an important factor effecting the modeled results.

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 8.12-1a and b (Calpine/Bechtel 1999a) shows the locations of both populated areas and sensitive receptors in the project vicinity.

IMPACTS

The Energy Commission staff has determined that aqueous ammonia and natural gas are the only hazardous materials to be handled 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

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.

Calpine/Bechtel's Response to Staff Data Request 48 provided the results of modeling for a worst case accidental release of aqueous ammonia. 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 1.0 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 would be confined to the project site.

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 short natural gas pipeline that could result in accidental release of natural gas. The design of the natural gas pipeline is governed by laws and regulations discussed in staff's **Facility Design** analysis.

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

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, 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 with the California Office of Emergency Services, Santa Clara 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

The worst case accidental release scenario evaluated by Calpine/Bechtel assumed that all accidental spills would occur from the storage vessel into the basin below the storage vessel. However, it is more likely that a spill would occur during delivery of ammonia. Such a spill could result in a large pool of aqueous ammonia and significantly higher down wind concentrations of ammonia. Thus, staff proposes a condition of certification requiring a catchment basin be provided between the delivery vehicle and the storage loading connection. This basin would passively drain into the basin below the storage tank or into a separate covered basin capable of containing the entire delivery vehicle's volume.

Staff also proposes a condition requiring development of a safety management plan for delivery of aqueous ammonia. The MEC will not be required to develop and implement a Process Safety Plan pursuant to Title 8. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures associated with the project and staff's proposed additional mitigation.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. The RMP will be submitted to EPA, Santa Clara County, and staff for evaluation. To insure adequacy of the RMP, staff 's proposed conditions of certification require that the RMP be submitted for concurrent review by EPA, Santa Clara County and staff. In addition, staff's proposed conditions of certification also require Santa Clara County's acceptance of the RMP and staff's approval of the RMP prior to delivery of any hazardous materials to the facility. 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 ammonia release.

PROPOSED CONDITIONS OF CERTIFICATION

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 Santa Clara County and 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 The project owner shall provide a Risk Management Plan to Santa Clara County and the CPM for review at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA) . The project owner shall reflect all recommendations of Santa Clara County and the CPM in the final document. A copy of the final plans, reflecting all comments, shall be provided to Santa Clara County and the CPM once approved by EPA.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia the project owner shall provide the final plans listed above and accepted by Santa Clara County to the CPM for approval.

HAZ-3 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least sixty days prior to the delivery of aqueous ammonia to the MEC facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-4 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 150% of the storage volume plus the volume associated with 24 hours of rain assuming the 25 year storm.

Verification: At least sixty days prior to delivery of aqueous ammonia to the MEC, 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-5 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 sixty 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.

REFERENCES

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NFPA (National Fire Protection Association). 1987. NFPA 85A, Prevention of Furnace Explosions in Fuel Oil and Natural Gas Fired Single Burner Boiler Furnaces, National Fire Protection Association, Batterymarch Park, Quincy, MA, 1987.

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Division of Medical Sciences, Assembly of Life Sciences, National Research Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).

Perry. 1973. Perry's Chemical Engineers' Handbook, Sixth Edition, McGraw-Hill, USA.

USOSHA (United States Occupational Safety and Health Administration). 1993. Process Safety Management / Process Safety Management Guidelines For Compliance. U.S. Department of Labor, Washington, DC.

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

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 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[2]	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[1]	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[2]	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL[3]	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[4]	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[2]	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2[5]	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 (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

** 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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NIOSH, 1994, National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Washington D.C., Publication number 94-116.

WHO, 1986, World health Organization, Environmental Health Criteria 54, Ammonia, WHO, Geneva, Switzerland.

ABBREVIATIONS

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 8.12-3 from the AFC (Calpine/Bechtel 1999a)]

WASTE MANAGEMENT

Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the Metcalf Energy Center (MEC) project. It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation, except wastewaters discharged to municipal treatment facilities. These are discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

- The management of wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner; and
- Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (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 generators of hazardous waste to comply with requirements regarding:

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

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

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 (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 criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file 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 set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

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

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

LOCAL

There are no local LORS for waste management.

SETTING

PROJECT AND SITE DESCRIPTION

The MEC project consists of a 600 megawatt natural gas-fired combined cycle power plant, a one mile natural gas pipeline, 10.2 mile recycled water supply lines, and a 0.8 mile municipal water supply and industrial wastewater discharge lines.

The project is proposed to be constructed on 14 acres, partly within the County of Santa Clara and partly within the city of San Jose. In 1998, Calpine Corporation commissioned a Phase I Environmental Site Assessment (ESA) for the site by Environmental Resources Management (ERM) in accordance with American Society for Testing and Materials Standard E 1527-97, Standard Practice for

Environmental Site Assessments (ERM 1999). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities.

The land at the proposed site has never been developed, although a portion was used for agriculture until about 1970. Over the past decade, mixed construction and wastes have been brought to the site and stored or dumped there. In addition, vehicle storage and, probably, vehicle maintenance have occurred at the site.

In November, 1998, ERM conducted a site inspection and identified the following:

- aboveground storage tanks were seen, although ERM was unable to verify if they were empty or full;
- evidence of hydraulic oil leaking into the soil from heavy equipment;
- discolored soil in and around open landfill areas;
- cans and drums with unknown contents; and
- possible existence of asbestos-containing material in piles of roofing or building debris.

ERM also conducted a database search of publicly available information to help determine the environmental status of the proposed site, and whether it may have been affected by possible off-site contamination. The search included federal and state agency records listing sites with leaking underground tanks, landfills, releases of hazardous materials, contaminated wells, sites where hazardous waste is handled, and facilities which release toxic chemicals to the air, water, or land. The search radius around the site ranged from 0.625 to 1.5 miles. ERM evaluated identified sites to determine their potential to have an adverse impact on the MEC site. Criteria used to evaluate sites included distance from the proposed MEC site, expected depth and direction of ground water and surface water flow, likely storm water flow direction, and the presence or absence of documented contaminant releases at the identified sites. ERM reported the following findings:

- The Pacific Gas and Electric substation, about 0.4 mile north of the proposed, site was the site of a petroleum hydrocarbon release from a 150 gallon underground storage tank (UST) closure in 1987. The case was closed by the Santa Clara Valley Water District (SCVWD) in 1993. Due to the distance and direction from the subject site, as well as the volume and level of soil contamination, ERM does not expect that the release poses any environmental concerns to the proposed site.
- In 1990, low levels of soil contamination were found about 0.6 mile northwest of the proposed site, at the location of a former gasoline station from which USTs had been removed in the late 1970s. The case was closed by the SCVWD in 1991, and should not affect the MEC site.

- Two diesel and two gasoline USTs were removed in 1994 from the Universal Gas location about 0.6 mile southeast of the MEC site. In 1998, the site was placed in the local oversite program due to the levels of soil contamination from total petroleum hydrocarbons. SCVWD has requested sampling to determine the full extent of residual soil contamination and any groundwater contamination. ERM concluded that, in spite of the distance to the MEC site, the potential for environmental effects upon that site cannot be stated until groundwater contamination and flow are known.
- A 5,000 gallon diesel spill occurred in 1993, about 0.1 mile north of the proposed site across Monterey Road. Although no information is available regarding contamination levels, ERM concluded it unlikely that the release would affect the MEC site, since it is hydrologically downgradient, and any contamination would be transported further away from the site.

Based on the results of the Phase I ESA, ERM made recommendations for sampling to assess potential impacts in shallow soils, debris, and groundwater. In June 1999, ERM performed a Phase II ESA to provide data to evaluate the scope of potential remedial activities for soil and groundwater and the need for removal of hazardous materials from the site (Calpine/Bechtel 1999j, data response #113). Based on soil sampling at eleven locations, water sampling at four locations, and sampling of construction debris, ERM concluded:

- There was evidence of soil contamination with petroleum fuels, lubricants, volatile fuel components, solvents, or semi-volatile constituents;
- Trace concentrations of pesticides at one location are likely the result of former agricultural activities;
- Elevated chromium and nickel concentrations at two locations, although likely higher than statistical background levels, appear to be isolated and do not seem to be related to any releases at the site;
- No evidence of groundwater contamination with the organic and inorganic constituents evaluated;
- About 40 cubic yards of asbestos contaminated soil and debris at the site will require removal; and
- There was no evidence of any other regulated wastes in the stockpile of debris.

Pursuant to a Memorandum of Understanding between the Commission and the Department of Toxic Substances Control (DTSC), DTSC staff provided comments to staff on the Application, including the Phase I and II ESAs (DTSC 2000). DTSC has determined that further investigation is required to adequately characterize the site. While acknowledging the sampling performed for the Phase II ESA, DTSC notes that although uncovered asbestos was found in stockpiles, surface soil samples were not collected. Further, the unlabeled drums and the area immediately surrounding them were not sampled, and it is unclear whether the stained surface soil near the open landfill areas were sampled. Also, it does not appear that any attempt was made to sample in the areas previously identified as

inaccessible, and the above ground storage tanks should be examined to determine their integrity and whether they contain any material.

In addition to the ESAs performed for the proposed site, a database search was performed for potentially contaminated sites which may be encountered during construction of the linear facilities (Calpine/Bechtel 1999r, data response # 210). The search was for known hazardous substance release sites and operating underground storage tanks up to one-half mile of either side of the proposed and alternative linear facility routes. Table WM210-1 (Id.) lists 28 leaking underground storage tanks within 250 feet of either side of the linear facilities. Of the 28 sites, 23 occur right on or directly adjacent to the proposed and alternative linear facilities. However, many of the sites are considered "closed" by the Santa Clara Valley Water District (SCVWD) and require "no further action", meaning that the site has been cleaned, or no cleanup activities were deemed necessary. Twelve of the sites are still under oversight by the SCVWD for potential groundwater contamination (Calpine/Bechtel 1999r, data response # 210, Table WM210-2 and Figures WM210-1A,1B). Contaminated soil or groundwater is likely to exist at the listed sites, but the extent of contamination is not indicated.

In addition to the reported leaking underground storage tanks, there are 24 sites within 250 feet of the linear routes that have a total of 79 active operating underground storage tanks (Calpine/Bechtel 1999r, data response # 210, Table WM210-3).

In comments addressing the linear facility routes, DTSC staff recommended that samples be collected at surface and at depth along proposed trench routes to characterize the soils to determine potential health risks to workers and soil management plans (DTSC 2000). Although some sampling should be conducted along entire proposed routes, the majority of samples should be collected in the vicinity of those sites that have the highest potential for contamination.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Project site preparation and construction will generate both nonhazardous and hazardous wastes.

The proposed site currently contains wrecked automobiles, lumber, makeshift buildings, and assorted trash and debris. The nonhazardous waste will be removed by a waste removal company. The recyclable portion of the waste will be recovered with the remaining waste transferred to a Class III landfill (Calpine/Bechtel 1999a, AFC p. 8.13-2).

A variety of non-hazardous waste streams will be generated from construction of the generating plant, electric transmission line, natural gas supply line, and water supply and wastewater discharge lines. Paper, wood, glass, and plastics will be

generated from packing materials, waste lumber, insulation, and empty chemical containers. The applicant estimates that about 100 tons of these wastes will be generated (Calpine/Bechtel 1999a, AFC p. 8.13-3), and those which cannot be recycled will be disposed of weekly in a Class III landfill. The applicant also expects that about 70 tons of excess concrete will be generated during the course of construction (Id.). This will be disposed of weekly in a Class III landfill or at clean fill sites. In addition, metal wastes will be generated from welding/cutting operations, packing materials, empty chemical containers, and wiring. About 25 tons of metal wastes are expected, and that which cannot be recycled will be deposited in a Class III landfill (Id.). Drilling will be necessary for some sections of the natural gas and water pipelines, and will require the use of nontoxic drilling mud. About 1,300 barrels will be used, and will be disposed at a Class II or III landfill (Id.).

Hazardous wastes that may be generated during construction include waste oil and grease, paint, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. The construction contractor is considered the actual waste generator and will be responsible for proper hazardous waste handling. Such wastes will be collected in hazardous waste accumulation containers near the point of generation. The containers will be taken to the construction contractor's hazardous waste storage area and within 90 days will be delivered to an authorized hazardous waste management facility (Calpine/Bechtel 1999a, AFC p. 8.13-4).

Initial pre-operational cleaning of internal surfaces of the heat recovery steam generators and auxiliary boiler will also generate chemical waste cleaning solutions and filters. These wastes will be stored temporarily on site in portable tanks, and will be disposed of off site by a chemical cleaning contractor in accordance with applicable regulatory requirements (Calpine/Bechtel 1999a, AFC p. 2-13).

Hazardous wastes may also be generated if contaminated soils are encountered during site preparation or linear facility construction. As mentioned above, DTSC has recommended that additional sampling be conducted at the site and along linear facility corridors. When construction is planned in areas near known contaminated sites, MEC has proposed the following procedures to assure proper management of soil suspected to be contaminated (MEC 1999b, p. 93):

- Hand-held detection equipment will be used in the field during excavation to ascertain the presence of volatile hazardous substances.
- Health and safety precautions will be implemented to prevent or minimize exposure to workers and the public if contaminated soil is determined to be present.
- Soil samples will be taken to confirm the nature of contamination.
- Soil suspected to be contaminated will be stockpiled near the site of excavation on polyethylene sheeting and covered while awaiting laboratory confirmation.
- Contaminated soil will be transported to an appropriately permitted facility.
- Only clean soil will be deposited back into the original excavation site.

In areas where there is no known or suspected contamination, soil which is discolored or has a petroleum hydrocarbon odor will be safely stockpiled until the nature of the contamination is determined by laboratory analysis. (Id.) If the soil is found to be contaminated, procedures similar to those listed above will be followed.

OPERATION

Under normal operating conditions, the proposed facility will generate both nonhazardous and hazardous wastes.

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, and used filters. The quantities of nonhazardous wastes generated from gas-fired facilities such as the MEC project are typically minor. MEC estimates that about 70 cubic yards annually of such wastes will be generated (Calpine/Bechtel 1999a, AFC p. 8.13-4).

During routine project operation, hazardous wastes likely to be generated include cleaning solutions, spent air pollution control catalysts, used oil and filters, used cleaning solvents, and contaminated cleanup materials. The hazardous wastes expected to be generated at the MEC facility, their origin, quantity, and disposal method are summarized in AFC Table 8.13-1. The majority of hazardous wastes generated will be recycled.

Hazardous wastes will be stored on site up to 90 days prior to their transport to a permitted facility by a licensed hauler. MEC has proposed that the storage area be surrounded by a berm sized to hold the contents of the single largest container plus an additional 20 percent to allow for rainfall (Calpine/Bechtel 1999a, AFC p. 8.13-11). The proposed design will have to meet the requirements of Title 22, California Code of Regulations, section 66264.175 which, in part, states that the containment system shall have sufficient capacity to contain precipitation from at least a 24-hour, 25-year storm plus 10 percent of the aggregate volume of all containers, or the volume of the largest container, whichever is greater. The Hazardous Material Compliance Division of Santa Clara County reviews hazardous waste containment plans when issuing their required Hazardous Material Clearance Form. Staff will propose that the project owner obtain such a form under condition of certification WASTE-5.

Chemical feed area drains consisting of spillage, tank overflows, effluent from maintenance operations, and liquid from area washdowns will be routed to a neutralization facility for pH adjustment. Elementary neutralization is a type of hazardous waste treatment under California regulations (Cal. Code Regs., tit. 22, § 67450.1 et seq.) and requires a permit from the Department of Toxic Substances Control.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Non-hazardous waste which is not recycled will be disposed of at one of the regional Class III landfills in the area. AFC Table 8.13-2 lists landfills and recycling facilities in the vicinity of the MEC project which accept nonhazardous wastes. Each of the facilities listed have large operating and permitted capacities relative to

the quantities of waste expected from MEC. Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amount of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Kern County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. There is a combined total in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these facilities with remaining lifetimes as long as 50 years. Also, the amount of hazardous waste being transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from MEC would comprise only a small fraction of existing capacity (less than one percent), and not significantly impact the capacity of any of the state's Class I landfills.

CUMULATIVE IMPACTS

Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

FACILITY CLOSURE

During any type of facility closure (see staff's **General Conditions** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff has determined that conditions of certification in the **General Conditions** section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of

all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, MEC is required to develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (Calpine/Bechtel 1999a, AFC p. 4-2).

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

Energy Commission staff concludes that MEC will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during project construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the San Francisco Bay Regional Water Quality Control Board or the CAL EPA - Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, MEC must acquire and maintain an EPA identification number as a hazardous waste generator. Accordingly, MEC will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, title 22, section 67100.1 et seq., a hazardous waste source reduction and management review may be required, depending on the amounts of hazardous waste ultimately generated.

MITIGATION

The Applicant intends to implement the following mitigation measures during construction and operation of the proposed MEC project (Calpine/Bechtel 1999a, AFC p. 8.13-11):

- Employees will be trained in hazardous waste procedures, spill contingencies, and waste minimization.
- Procedures will be developed to reduce the quantity of hazardous wastes generated. Nonhazardous materials will be used instead of hazardous materials whenever possible, and wastes will be recycled whenever possible.

Energy Commission staff has examined the mitigation measures proposed by MEC and concluded that the measures together with applicable LORS will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of the MEC project will not result in any significant adverse impacts if MEC implements the mitigation measures proposed in the Application for Certification (99-AFC-3), the

additional measure proposed by staff below, and the proposed conditions of certification.

Staff agrees with the procedures proposed by MEC regarding proper management of soil suspected to be contaminated (Calpine/Bechtel 1999h, p. 93), including use of hand-held detection equipment during excavation to ascertain the presence of volatile hazardous substances, implementing health and safety precautions to prevent or minimize exposure to workers and the public from contaminated soil, confirming the nature of contamination through sampling, stockpiling and covering contaminated soil near the site of excavation while awaiting laboratory confirmation, transporting contaminated soil to a permitted facility, and using only clean soil for backfill.

Staff further recommends that, during excavation activities, MEC have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I environmental Site Assessments) available to determine the need for sampling when contamination is suspected, and to coordinate the above activities as necessary. If significant remediation may be required, MEC should also contact representatives of the Santa Clara County Department of Environmental Health and Region 2 of the California Department of Toxic Substances Control for consultation and possible oversight of remedial activities.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control 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 CPM via the monthly compliance report of its receipt.

WASTE-2 The project owner shall notify the CPM of any waste management-related enforcement action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.

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

WASTE-3 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 for all wastes generated during construction and

operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

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 operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I environmental Site Assessments) available for consultation during soil excavation and grading activities. If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Santa Clara County Department of Environmental Health and Region 2 of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall notify the CPM in writing within 5 days of any reports filed by the environmental professional, and indicate if any substantive issues have been raised.

WASTE-5 The project owner shall obtain a Hazardous Material Clearance Form from the Santa Clara County Hazardous Materials Compliance Division.

Verification: Prior to the start of construction, the project owner shall provide an approved copy of the Santa Clara County Hazardous Materials Compliance Division's Hazardous Material Clearance Form to the CPM.

REFERENCES

Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.

Calpine/Bechtel. 1999h. 1a data responses to CEC data requests submitted to the California Energy Commission on August 23, 1999.

Calpine/Bechtel. 1999j. 1c data responses to CEC data requests submitted to the California Energy Commission on September 23, 1999.

Calpine/Bechtel. 1999r. Set 2c data responses dated November 12, 1999.

DTSC. 2000. Letter from Barbara J. Cook, Chief, Northern California – Coastal Cleanup Operations Branch to Mike Ringer, CEC. March 21.

ERM (Environmental Resources Management). 1999. Phase I Environmental Site Assessment, Metcalf Site, San Jose, CA, April 13.

LAND USE

Eric Knight

INTRODUCTION

This land use analysis of the Metcalf Energy Center (MEC) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities can be incompatible with existing and planned land uses when it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts or precludes existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Calpine/Bechtel has a purchase option on Assessor's Parcel Number (APN) 708-29-003, which includes 116 acres on the southeast side of Tulare Hill (Lot 5) and 10 acres of flat area at the base of Tulare Hill on the southeast side of Fisher Creek (Lot 7). This 126-acre parcel is currently in unincorporated Santa Clara County but within the Sphere of Influence of the City of San Jose[1]. The 10-acre flat area is within the Urban Service Area of the City of San Jose[2]. The applicant also has an ownership interest in 10 acres of Lot 6 (APNs 708-23-002, 003). This area is within the San Jose City limits. On August 12, 1999, Calpine/Bechtel filed an Annexation application with the City of San Jose to annex the 10-acre flat area at the base of Tulare Hill[3]. The Tulare Hill portion of the property would remain in the County and would not be developed. Lot 7 and the 10 acres from Lot 6 would be combined through the Tentative Map process to configure a 20-acre site for the proposed power plant. Please refer to **LAND USE Figure 1**.

Since the proposed power plant site currently is located partly within the City of San Jose and partly within unincorporated Santa Clara County, staff reviewed all the San Jose and Santa Clara County planning documents relevant to the project. In addition, portions of the project's electrical transmission line and natural gas supply pipeline traverse unincorporated areas of Santa Clara County. A discussion of the project's conformity with applicable goals, policies, standards, and regulations from each of these

[1] A city's Sphere of Influence delineates the expected future physical boundaries and service area of that city.

[2] An Urban Service Area (USA) is defined as all developed, undeveloped, or agricultural lands, either incorporated or unincorporated, within a city's Sphere of Influence, where services and facilties are generally available, and where urban development requiring such services should be located.

[3] A special provision of the Cortese-Knox Local Government Reorganization Act of 1985 (Gov. Code § 56826) allows cities within Santa Clara County to approve their own annexations within the established urban service area, bypassing the approval of the Santa Clara County Local Agency Formation Committee (LAFCO). This procedure is referred to generally as "city-conducted" annexations.

LAND USE Figure 1
Proposed Power Plant Site

planning documents can be found in the subsection entitled COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS.

CITY OF SAN JOSE

GENERAL PLAN

The San Jose 2020 General Plan contains each of the elements mandated by Government Code Section 65302 (land use, circulation, housing, conservation, open space, noise, and safety). The elements have been combined into "a consistent meaningful whole" and organized to meet the needs of public officials, developers, neighborhood organizations, and community members. The General Plan contains a statement of development policies and includes a Land Use / Transportation Diagram and text, which set forth the objectives, principles, standards, and plans to guide development proposals. The General Plan states that it must always be considered in its entirety, with no single policy, principle, standard, or plan read and considered in isolation and not applied or interpreted so rigidly as to impede attainment of its objectives.

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA MASTER DEVELOPMENT PLAN

In 1985, the City of San Jose amended its General Plan to allow Campus Industrial uses in North Coyote Valley. The Campus Industrial category is intended to allow development with a unique campus design concept that takes advantage of the site's natural features and incorporates substantial amounts of landscaped and natural open space. Adopted by the San Jose City Council on May 28, 1985, the Master Development Plan represents a "clear and unequivocal" statement of how San Jose's General Plan is to be implemented in North Coyote Valley. The City of San Jose's goals for the development of North Coyote Valley are to provide much-needed, large, single-user sites where major companies can consolidate their operations and, by doing so, ensure the region's long-term economic health. The Master Development Plan also sets forth the standards required to implement Public and Private Improvements[4]. Of the Private Improvement Guidelines, the Master Development Plan states that:

The unusually restrictive nature of these guidelines is deliberate. North Coyote Valley will attract and hold the major "high technology" users it is intended to accommodate only if there is a clearly established standard of excellence and a commitment to meet that standard.

RIPARIAN CORRIDOR POLICY STUDY

The Riparian Corridor Policy Study was adopted by the San Jose City Council on May 17, 1994, and revised March 1999. The overall purpose of the study is to explore in detail issues related to General Plan policies that promote the preservation of riparian corridors (the areas along natural streams) and how these

[4] Amendments to the Private Improvement Standards and General Development Standards were approved by the City Council on November 8, 1999.

corridors should be treated for consistency with the General Plan. The study primarily addresses riparian corridors within San Jose's Urban Service Area. Fisher Creek, which traverses the MEC site on its west and north sides, is included in the study. Recognizing that potential conflicts exist among competing land uses along riparian corridors (e.g., land development, flood control protection, habitat preservation), the study attempts to achieve a balance among these potentially incompatible land use activities through the application of development guidelines. The study states that these development guidelines are intended for use within the context of the overall goals of the City.

ZONING ORDINANCE

According to the Master Development Plan, development in North Coyote Valley will occur through Planned Development (PD) zoning. The Planned Development Zone or District is an override district, which is always combined with a conventional zoning district. The portion of the MEC site in the City is zoned Agriculture (A). The portion of the site currently in the County is zoned Agriculture, 20-acre minimum (A-20ac). On August 12, 1999, Calpine/Bechtel filed Planned Development and Prezoning[5] applications to rezone the site A (PD). Approval of a PD District involves City Council adoption of an ordinance that includes specific land use regulations, design parameters, and performance standards for the site and its use. City planning staff will determine appropriate development standards for the MEC based on applicable City plans and policies, such as the North Coyote Valley Campus Industrial Area Master Development Plan (SJ 1999b).

COUNTY OF SANTA CLARA

GENERAL PLAN

Policies in the Santa Clara County General Plan (1995-2010) seek to maintain the scenic character of the rural, unincorporated areas of the County and to promote conservation and productive use of their natural resources for agriculture, ranching, watershed, public recreation, and wildlife habitat. In regard to unincorporated lands within city urban service areas, the General Plan states that these areas should eventually be annexed to their surrounding cities. Until annexation occurs, development proposals within these areas must conform to the uses allowed in the surrounding city's general plan (Santa Clara County, 1994).

SETTING

POWER PLANT SITE AND VICINITY

The proposed power plant site is located in Coyote Valley, which lies between the southernmost part of urbanized San Jose and the northern edge of the City of Morgan Hill. The power plant site is located at the northern end of Coyote Valley at

[5] Prezoning is usually done before annexation of unincorporated land to a city in order to facilitate its transition into the city boundaries. The advantage is that a city will have zoning in effect immediately upon annexation.

the base of Tulare Hill. Monterey Highway lies to the east of the site and Metcalf Road is to the north. The site is bordered by Fisher Creek to the north and west and the Union Pacific Railroad (UPRR) tracks to the east. Blanchard Road is to the south. The energy facilities and buildings would occupy 5.3 acres of the 20-acre site. Approximately 12.5 acres of the site would be landscaped to provide a buffer for adjacent properties and the Fisher Creek riparian corridor. The site access road, internal roads, and parking area would occupy the remainder of the site (Calpine/Bechtel, 2000d). A 10-acre area adjacent to and south of the site would be used as a temporary laydown/staging area during construction of the power plant.

The 10-acre flat area at the base of Tulare Hill (the portion of the site under the County's jurisdiction) is currently used for storage of old vehicles and construction debris and for raising poultry and some minor cattle grazing. No cultivation activities occur on this portion of site. The southern 10 acres of the site and the 10-acre construction laydown area are currently farmed for field crops. The entire MEC site is designated as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County compiled by the California Department of Conservation (CDC, 1999).

Existing land uses within a one-mile radius of the MEC site are shown on **LAND USE Figures 2 – 4**. These uses include agricultural land, the Coyote Creek Parkway, and commercial uses. Sensitive land uses include scattered residences, the closest of which is located about 1,150 feet southeast of the MEC site (Calpine/Bechtel 1999a, p. 8.5-4). The Santa Teresa residential neighborhood is located on the northwest side of Tulare Hill a little more than 0.5 mile from the site. An elementary school is located about 1.4 miles southeast of the site (Calpine/Bechtel 1999a, p. 8.5-4). Major electrical transmission lines owned by Pacific Gas & Electric Company (PG&E) are located about 200 feet north of the site. These lines traverse Tulare Hill east to west and connect to the PG&E Metcalf Substation, which is located about 2,000 feet northeast of the site adjacent to U.S. 101.

City of San Jose and Santa Clara County General Plan designations within one mile of the MEC site are shown on **LAND USE Figures 5 and 6**. The MEC site is designated Campus Industrial on the San Jose General Plan Land Use Diagram. The Santa Clara County General Plan designation for the site is Urban Service Area.

LAND USE Figure 2
Existing Land Uses within One Mile of the MEC Site

LAND USE Figure 3
Existing Land Uses within One Mile of the MEC Site

LAND USE Figure 4
Existing Land Uses within One Mile of the MEC Site

LAND USE Figure 5
Existing Land Uses within One Mile of the MEC Site

LAND USE Figure 6
City of San Jose General Plan Designations
within One Mile of the MEC Site

LAND USE Figure 7
Santa Clara County General Plan Designations
within One Mile of the MEC Site

LINEAR FACILITIES

ELECTRICAL TRANSMISSION LINE

The power plant would interconnect with an existing PG&E 230 kV transmission line, which passes near the northern boundary of the MEC site, via a new 230 kV transmission line approximately 200 feet in length. The interconnection would be made at an existing transmission tower on Tulare Hill. The proposed transmission line would traverse primarily undeveloped grazing land in unincorporated Santa Clara County. The transmission line route is designated Am (Agriculture – medium scale) on the County Land Use Plan and zoned A-20Ac. The same area is designated Non-Urban Hillside on the City of San Jose Land Use Diagram. The City does not have a zoning designation for this area.

NATURAL GAS SUPPLY PIPELINE

Natural gas would be delivered to the MEC via approximately one mile of new 16-inch pipeline that will connect to an existing PG&E main pipeline (Line 300), which runs along the east side of U.S. 101. A gas metering station, which consists of an aboveground segment of pipe and associated valves, metering equipment, and support structures, would be located immediately adjacent to PG&E's Line 300 on vacant land that lies just east of Malech Road and south of the county road that intersects Malech Road. The gas metering station would be within a 35 feet by 80 feet fenced area and would lie 370 feet from the northbound outside lane of U.S. 101 (Calpine/Bechtel, 2000f). The proposed pipeline would be bored beneath U.S. 101. It would then follow along Coyote Ranch Road and an unnamed road west toward Monterey Road. The pipeline would use the horizontal directional drilling (HDD) method to go under Coyote Creek, Monterey Road, and the UPRR tracks, to a point on the western side of the railroad tracks just north of Blanchard Road. The pipeline would then proceed north along the western side of the railroad right-of-way to the power plant site (Calpine/Bechtel 1999a, p. 6-1).

About one-third of the gas pipeline route is within the City of San Jose and the remainder is within unincorporated Santa Clara County. Existing land use along the proposed gas pipeline is primarily park, vacant, and agricultural land. The route traverses areas designated PL (Other Public Open Lands) and P (Regional Parks, Existing) on the County Land Use Plan and Campus Industrial on the San Jose Land Use Diagram. The route is primarily zoned agricultural.

WATER SUPPLY AND WASTEWATER PIPELINES

A new 10.2-mile long recycled water pipeline would be constructed to deliver cooling water to the MEC. As described in AFC Supplement A (Calpine/Bechtel 1999e), the recycled water pipeline would begin north of the power plant site and weave its way along paved city streets, traveling primarily through residential and commercial areas, until reaching Fisher Creek at Santa Teresa Boulevard. South of Fisher Creek the recycled water pipeline would turn northeast, travelling through agricultural land on its way to the MEC site. The pipeline segment from Santa Teresa Boulevard to the MEC site is labeled "Segment B-3" in Supplement A. The

agricultural land traversed by Segment B-3 is planted in safflower, orchard trees, wheat, and row crop. Existing land uses within 0.25 mile of the recycled water pipeline are shown on AFC Figures 3.2-1a – 3.2-1g. Planned land use along Segment B-3 is Campus Industrial.

Domestic water would be supplied from either onsite wells or by the San Jose Municipal Water System (San Jose MUNI) via a new 24-inch, 1.25-mile long pipeline[6]. The domestic water supply pipeline would begin at Well #23 near Bailey Avenue and travel north to the MEC site along the western side of the UPRR right-of-way through agricultural land currently farmed for field crops (Calpine/Bechtel 2000a, data response # 3-229). The area traversed by the pipeline route is planned for Campus Industrial uses.

San Jose MUNI has domestic water pipelines in Santa Teresa Boulevard. As described in AFC Supplement A, the MEC may tap into a supply pipeline in Santa Teresa Boulevard as an alternative to the 1.25-mile long pipeline from Well #23. The alternative 0.8-mile long domestic water supply pipeline would follow the same route as Segment B-3 of the recycled water supply pipeline.

As described in AFC Supplement A, the MEC would discharge industrial wastewater and sewage into an existing sewer pipeline in Santa Teresa Boulevard. Industrial wastewater and sewage would be conveyed in a single pipeline, which would follow the same route as Segment B-3 of the recycled water supply pipeline.

Construction of the recycled water pipeline, alternate domestic water pipeline, and wastewater discharge pipeline along Segment B-3 would require a construction corridor with a maximum width of 66 feet (Calpine/Bechtel 1999e, page 2-3).

SITE ACCESS ROAD

The power plant site would be accessed via a new 900-foot long, 2-lane road. It would start at Blanchard Road and parallel the railroad tracks north to the MEC site. The site access road would be located on land that is currently used for agriculture and planned for Campus Industrial uses.

IMPACTS

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

- 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.
- Disrupt or divide the physical arrangement of an established community.
- Convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use.

[6] As an alternative to San Jose MUNI, domestic water may be supplied by Great Oaks Water Company via an interconnection point that has not been defined.

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

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the commission determines that such facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity." When determining whether a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with the applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (Pub. Resources Code, § 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the project is consistent or at variance with each requirement or standard[7].

CITY OF SAN JOSE

GENERAL PLAN

Land Use Diagram

The 20-acre power plant site is designated Campus Industrial on the Land Use Diagram of the City of San Jose General Plan. According to the General Plan, land uses allowed in the Campus Industrial category are industrial research and development, administration, marketing, assembly, and manufacturing. A heavy industrial use, such as a power plant, would not be allowed by the Campus Industrial designation. To allow development of the project, Calpine/Bechtel filed a General Plan amendment on March 1, 1999 to change the land use designation of the site from Campus Industrial to Public/Quasi-Public[8]. The Pubic/Quasi-Public category is used to designate public land uses, including schools, libraries, fire stations, water treatment facilities, governmental offices, and airports. This category is also used to designate lands used by some private entities, including public utilities and the facilities of any organization involved in the provision of public services, such as gas, water, electricity, and telecommunications. A power plant would be consistent with the Public/Quasi-Public General Plan designation.

[7] A summary of the project's consistency with applicable laws, ordinances, regulations, and standards can be found in Appendix A of this analysis.

[8] The Tulare Hill portion of the 126-acre parcel under Calpine/Bechtel's control is designated "Non-Urban Hillside" on the San Jose Land Use Diagram. The Non-Urban Hillside designation would remain unchanged.

The City of San Jose Planning Department staff indicated that a power plant could be allowed by either the Public/Quasi Public or Heavy Industrial General Plan designations (CEC 1999c). However, the City of San Jose staff determined that the Public/Quasi Public land use designation would be more appropriate for North Coyote Valley since the area is not planned for heavy industrial uses. According to the City of San Jose, the Public/Quasi Public designation would provide the City with more land use control than the Heavy Industrial designation, which allows for a broad range of uses that could lead to incompatibilities between the Heavy Industrial and Campus Industrial uses. This control is important to the City of San Jose in the event that the General Plan amendment is approved but the MEC does not proceed. According to the City of San Jose, there is little likelihood that another Public/Quasi Public use would be proposed for the site before the City could change the General Plan designation back to Campus Industrial (SJ 1999b).

The City of San Jose Planning Commission and City Council will consider the General Plan amendment in summer 2000. The proposed Planned Development Rezoning/Prezoning and Annexation will be considered at that time as well.

Major Strategies

The Major Strategies of the General Plan establish the basic framework for planning in San Jose. The following Major Strategies are applicable to the project. Please see the **SOCIOECONOMICS** section of the Preliminary Staff Assessment (PSA) for a discussion of the project's consistency with the Economic Development Major Strategy.

The Growth Management Major Strategy addresses the need to balance the urban facilities and services of new development with the need to balance the City's budget. Infill development within urbanized areas is identified as an important means of controlling service costs through increased efficiency. New development is expected to pay for the infrastructure (e.g., streets, sewers, storm drains, and fire stations) required to support it.

Consistency: Development of the project in rural North Coyote Valley would not constitute "infill" development. Infill development is development on vacant sites within an urbanized area. However, the project site is within the City of San Jose's Urban Service Area, which is defined by the General Plan as an area where urban services and facilities are generally available, and where urban development requiring such services should be located. The project would connect to City domestic water and sewer pipelines that exist within a short distance of the site. A new 10.2-mile long recycled water supply pipeline would be constructed to deliver cooling water to the project. Because the MEC would be located in an area where urban services and facilities are generally available, the project would be consistent with the Growth Management Major Strategy. Please refer to the **SOCIOECONOMICS** section of the PSA for a discussion of the project's potential impacts on urban services and facilities.

The Greenline Major Strategy is directed to preserving the scenic backdrop of the hillsides surrounding San Jose, preserving land that protects water, habitat, or agricultural resources and offers recreational opportunities.

Consistency: The current architectural design of the power plant would not substantially block views of the surrounding hillsides. Please refer to the **VISUAL RESOURCES** section of the PSA for a detailed analysis of the project's potential effects on views of the hillsides. Calpine/Bechtel proposes to preserve, in perpetuity, the 116-acre parcel that forms the southeast side of Tulare Hill (CH2MHILL, 2000a). The applicant would provide funds for managed cattle grazing of Tulare Hill for the life of the power plant project (expected to be 30 years). Managed grazing of nonnative grasses is intended to promote growth of native plants, which are habitat for the Bay checkerspot butterfly. The applicant would also make improvements to the Fisher Creek Riparian Corridor. The planting of native trees would double the amount of existing riparian habitat. Other improvements would include installing permanent fencing to prevent cattle from entering Fisher Creek, and removing non-natural debris from the stream (CH2MHILL, 2000b). Please refer to the **BIOLOGICAL RESOURCES** section of the PSA for a more complete discussion of potential impacts to biological resources and proposed mitigation measures. The project would maintain a 100-foot setback from the Fisher Creek Riparian Corridor. A recreational trail, as shown on the General Plan Scenic Routes and Trails Diagram, could be accommodated within the 100-foot setback. In summary, the project would preserve the scenic backdrop of the surrounding hillsides, would preserve land that protects water, habitat, and agricultural resources, and would offer recreational opportunities. Thus, the project would be consistent with the Greenline Major Strategy.

The Sustainable City Major Strategy is a statement of San Jose's desire to become an environmentally and economically sustainable city. A "sustainable city" is a city designed, constructed, and operated to minimize waste, efficiently use its natural resources, and to manage and conserve them for the use of present and future generations.

Consistency: Toward this goal the project would use reclaimed water for cooling purposes. This would provide a beneficial use for the City's wastewater and reduces its discharge to the San Francisco Bay. Thus, the project would be consistent with the Sustainable City Major Strategy.

Goals and Policies

Residential Land Use

In part, the Residential Land Use goals and policies reflect concerns for the protection of residential neighborhoods from incompatible land uses. Residential Land Use Policy #2 states that residential neighborhoods should be protected from

the encroachment of incompatible activities or land uses that may have a negative impact on the residential living environment[9].

Consistency: The project site is within an area planned for industrial uses. Tulare Hill would separate the project from the nearest residential neighborhood (Santa Teresa) located about 0.5 mile north of the site. Staff has found that the project would not have any significant adverse noise, public health, traffic or visual impacts on the nearby Santa Teresa neighborhood (please see the **NOISE**, **PUBLIC HEALTH**, **TRAFFIC AND TRANSPORTATION**, and **VISUAL RESOURCES** sections of the PSA). Because the power plant would not encroach upon a residential neighborhood and would not have a negative impact on the residential living environment, the project would be consistent with Residential Land Use Policy #2.

Industrial Land Use

Industrial Land Use Policy #1 states that industrial development should incorporate measures to minimize negative impacts on nearby land uses. Industrial Land Use Policy #10 states that interface problems between existing residential and new industrial areas should be resolved through the site design and discretionary permit process.

Consistency: Several rural residences are located within one mile of the power plant site. The project incorporates measures to reduce the noise impacts on the nearest residence. However, the applicant's proposed mitigation measures do not reduce noise impacts to a level of less than significant. Staff has proposed a condition of certification that would reduce these noise impacts to a less than significant level. If the project were modified to comply with this condition, it would be consistent with Industrial Land Use Policy #1 in regard to noise impacts on nearby land uses. Please see the **NOISE** section of the PSA. The project also incorporates measures to reduce the visual impacts of the project. However, staff has found visual impacts on nearby residences to be significant and unmitigable (please refer to the **VISUAL RESOURCES** section of the PSA). Thus, the project would be inconsistent with Industrial Land Use Policy #1 because it would not mitigate negative impacts on nearby land uses to a level of less than significant.

Urban Design

The City's urban design goal is to require the highest standards of architectural and site design for all development projects, both public and private. The General Plan sets forth the following policies to achieve this goal.

Urban Design Policy #1 states that the City should continue to apply strong architectural and site design controls on all types of development for the protection and development of neighborhood character and for the proper transition between areas with different types of land uses. Policy #22 states that design guidelines

[9] According to the San Jose General Plan, "should" signifies a directive to be honored in the absence of significant countervailing considerations.

adopted by the City Council should be followed in the design of development projects.

Consistency: The City of San Jose is particularly concerned about the project's compatibility with the Campus Industrial uses that North Coyote Valley was intended to accommodate. The City has indicated that the project would be required to comply with the North Coyote Valley Campus Industrial Area Master Development Plan, the design guidelines adopted by the City Council to guide development of North Coyote Valley (SJ 1999b). Please refer to the **VISUAL RESOURCES** section of the PSA for a detailed analysis of the project's compliance with the design guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan.

Urban Design Policy #2 states that private development should include adequate landscape areas, which utilize water efficient plant materials and irrigation systems and include provision for ongoing maintenance.

Consistency: According to the MEC Planned Development Zoning application (Calpine/Bechtel, 2000d), proposed landscape areas, including the planting of riparian tree and shrub species in the Fisher Creek riparian corridor, would cover 62 percent of the site. All planting areas on the site would be watered with an approved automatic underground irrigation system that would be designed to make efficient use of water through conservation techniques. Maintenance of the riparian trees and shrubs would extend for a period of at least two years. Maintenance would include weed control, irrigation, and monitoring for grazing. Plant mortality surveys would be conducted on a periodic basis for a period of 3 to 5 years after initial planting to determine replanting needs (CH2MHILL, 2000b). For a more thorough discussion please see the **BIOLOGICAL RESOURCES** section of the PSA. With the exception of the coast redwoods, all of the trees and shrubs that would be used for landscaping on the site are water efficient. The coast redwoods have been chosen because they are evergreens and grow tall and would provide maximum visual screening of the power plant. The AFC does not mention a provision for ongoing maintenance of the landscaped areas planted for aesthetic screening. However, the **VISUAL RESOURCES** section of the PSA proposes a condition of certification that would require ongoing maintenance and replacement of unsuccessful plantings. If the project were modified to comply with this condition, it would be consistent with Urban Design Policy #2.

Urban Design Policy #11 establishes a maximum building height of 120 feet for the Campus Industrial designated areas of North Coyote Valley, and a maximum height of 95 feet in any area designated for Public/Quasi-Public uses. Urban Design Policy #11 also allows height limits to be established in the context of project review "for structures, other than buildings, where substantial height is intrinsic to the function of the structures and where such structures are located to avoid significant adverse effects on adjacent properties."

Consistency: The project has been designed to meet the 95-foot height limit for all proposed buildings and structures except the 145-foot tall Heat Recovery Steam Generator (HRSG) stacks and some HRSG external piping, vent silencers, and their

support structures. In their September 28, 1999 comment letter on Calpine/Bechtel's Planned Development Zoning application, the City of San Jose indicated that the height exception allowed by Urban Design Policy #11 could be applied to the MEC. The City requested that the applicant provide supporting information to justify the need to exceed the 95-foot height limit for Public/Quasi Public uses. In their response dated February 16, 2000, Calpine/Bechtel explained that the 145-foot height of the HRSG stacks was determined by air quality modeling as the height required to provide for adequate dispersion of plant emissions under all meteorological conditions to prevent significant adverse impacts to local air quality. According to the applicant, the location of the HRSG external piping, vent silencers, and their support structures above the HRSG steam drums is necessary to the function of the HRSGs. Staff anticipates that the City of San Jose will make a determination on the applicability of the height exception, and therefore compliance with Urban Design Policy #11, in summer 2000 when the City of San Jose Planning Commission and City Council consider Calpine/Bechtel's proposed General Plan amendment.

Trails and Pathways

The City's trails and pathways goal is to provide a network of trails and pathways throughout the City in order to maximize the City's recreational opportunities and to provide alternate means of reaching regional parks and other natural areas. Policies set forth to achieve this goal include the following. Policy #1 states that the City should control land development along designated Trails and Pathways Corridors in order to provide sufficient trail right-of-way and to ensure that new development adjacent to the corridors does not compromise safe trail access nor detract from the scenic and aesthetic qualities of the corridor. Policy #2 states that when new development occurs adjacent to a designated Trails and Pathways Corridor, the City should encourage the developer to install and maintain the trail. Policy #7 states that trails should be built to meet the trail standards established by the Department of Public Works. Trail design should provide sufficient light, vertical and horizontal clearance, and landscape setbacks from adjacent development to ensure a safe and aesthetically pleasing recreational experience.

Consistency: The General Plan Scenic Routes and Trails Diagram shows a recreational trail running along Fisher Creek. The project would maintain a 100-foot setback from the Fisher Creek riparian corridor. An area within the setback area could accommodate a trail along the south/east side of Fisher Creek. Therefore, the project is consistent with Trails and Pathways Policy #1. The current landscape plan for the project does not designate a trail within the Fisher Creek riparian setback area. Staff has proposed a condition of certification (**LAND-1**) requiring Calpine/Bechtel to build and maintain the portion of the Fisher Creek trail that would cross the MEC site to the trail standards established by the City of San Jose Department of Public Works. If the project were modified to comply with this condition, it would be consistent with Trails and Pathways Policies #2 and #7. Please refer to the **VISUAL RESOURCES** section of the PSA for a discussion of the project's potential visual impact on the proposed trail.

Riparian Corridors

Riparian Corridor Policy #2 states that new public and private development adjacent to riparian corridors should be consistent with the provisions of the Riparian Corridor Policy Study.

Consistency: The project would be inconsistent with several of the provisions of the Riparian Corridor Policy Study. Please refer to the discussion on the Riparian Corridor Policy Study below.

Policy #3 states that new development within the Urban Service Area should be set back from the outside edge of riparian habitat (or top of bank, whichever is greater) a distance sufficient to buffer the impacts of adjacent human activities and provide avenues for wildlife dispersal.

Consistency: Under specified circumstances, the City of San Jose allows exceptions to the minimum 100-foot setback from riparian corridors. Given the intensity of the proposed project, the City of San Jose determined that the 100-foot setback is appropriate in this case (SJ 1999c). In response, the applicant revised the project to ensure that all structures maintain a minimum 100-foot setback from the Fisher Creek riparian corridor.

Policy #4 states that new development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone.

Consistency: The project would be designed to protect the adjacent Fisher Creek riparian corridor from the encroachment of lighting, exotic landscaping, and toxic substances. The **VISUAL RESOURCES** section of the PSA proposes a condition of certification that all project lighting be shielded to prevent off-site glare. If the project were modified to comply with this condition, it would be consistent with Riparian Policy #4 in regard to lighting. The planned improvements to the Fisher Creek riparian habitat would include only native tree and shrub species, so the project would be consistent with Policy #4 in regard to exotic landscaping. The project would include secondary containment at the aqueous ammonia unloading/storage area to prevent the contents of the storage tank or a delivery truck from entering the riparian corridor in the event of a spill. Materials storage areas for other hazardous materials, such as sulfuric acid, phosphate and sodium hypochlorite, would include containment structures (i.e., berms). Therefore, staff expects that the project would be consistent with Policy #4 in regard to toxic substances. For more information please refer to the **HAZARDOUS MATERIALS MANAGEMENT** and the **SOIL AND WATER RESOURCES** sections of the PSA. At the boundary of the Fisher Creek riparian corridor, operational noise is projected to be about 60 decibels (CH2MHILL, 2000b). Staff estimates that the ambient nighttime noise level within the Fisher Creek riparian corridor would be similar to the noise level at the nearest residence, which ranges from 37 to 53 decibels. Thus, an increase in noise by as much as 23 decibels would encroach upon the riparian corridor. Therefore, the project would be inconsistent with Riparian Corridor Policy #4 in regard to noise. Staff anticipates that the new trees planted in the Fisher

Creek riparian corridor would buffer the noise generated by the power plant and the impact on wildlife within the corridor would not be significant. Please see the **BIOLOGICAL RESOURCES** section of the PSA for a more complete discussion.

North Coyote Valley Campus Industrial Area Master Development Plan

The North Coyote Valley Campus Industrial Area Master Development Plan represents a "clear and unequivocal" statement of how San Jose's General Plan is to be implemented in North Coyote Valley. The area is intended to accommodate major "high technology" companies on large, single-user sites where they can consolidate their operations. For example, the proposed Coyote Valley Research Park (CVRP), an approximately 400-acre campus consisting of 6.6 million square feet of office, research and development, assembly, and light manufacturing uses, is the type of development that the General Plan envisioned for North Coyote Valley. A power plant is most appropriately defined as a "heavy industrial" use, which North Coyote Valley is not planned to accommodate. Thus, the project is generally inconsistent with the North Coyote Valley Campus Industrial Area Master Development Plan.

The City of San Jose has indicated that the Master Development Plan is applicable to any development in North Coyote Valley regardless of General Plan designation (SJ 1999b). Therefore, if the General Plan amendment is approved, and the land use designation of the MEC site is changed from Campus Industrial to Public/Quasi Public, the project would still need to adhere to the guidelines and standards of the Master Development Plan.

Private Improvement Guidelines

Those guidelines that pertain to architectural design, building site layout, and landscaping are addressed in the **VISUAL RESOURCES** section of the PSA.

Building Height

Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan.

Consistency: With the exception of the HRSG stacks and ancillary equipment, the project would comply with the 95-foot height limit for Public/Quasi Public uses. Urban Design Policy #11 allows for additional height of structures, other than buildings, if substantial height is intrinsic to the function of the structure. The 145-foot height of the HRSG stacks was determined by air quality modeling as the height required to provide for adequate dispersion of plant emissions under all meteorological conditions to prevent significant adverse impacts to local air quality. A determination on the applicability of the height exception, and therefore the project's consistency with Urban Design Policy #11, will be made in summer 2000 when the City of San Jose Planning Commission and City Council consider Calpine/Bechtel's proposed General Plan amendment.

Orchard Planting

Provide an equally spaced orchard-like landscape planting in parking areas. Minimum standards are 1 tree for every 4 standard parking spaces and 1 tree for every 5 compact spaces. The maximum size of any individual parking orchard area should not exceed two acres.

Consistency: The proposed landscaping for the MEC parking area would be inconsistent with this guideline. The proposed orchard trees and shrubs are not equally spaced throughout the parking area but clustered around the boundaries of the parking area. Staff has proposed a condition of certification (**LAND-2**) requiring the applicant to landscape the parking area consistent with this guideline. If the project were modified to comply with the condition, it would be consistent with this guideline.

Monterey Highway Edge

A 50-foot landscape easement will separate properties from the Union Pacific (formerly Southern Pacific) railroad right-of-way.

Consistency: The project proposes buildings as close as 6 feet from the east property line along the Union Pacific Railroad right-of-way (Calpine/Bechtel, 2000b). Thus, the project would not be consistent with this guideline. Staff has proposed a condition of certification (**LAND-3**) requiring the applicant to design the project to meet all setback requirements. If the project were modified to comply with the condition, it would be consistent with this guideline. Please also refer to the **VISUAL RESOURCES** section for a discussion on consistency with this guideline. However, compliance could require expansion of the project site to the southeast, increasing impacts to agriculture and requiring additional noise mitigation.

Entry Identification

Direction signs to major property entrances should be located not less than 100 feet from the intersection. Identity signs will be located on the entry drive median. Gatehouses must be located at least 50 feet from face of curb.

Consistency: Staff does not have sufficient information regarding project design to determine whether the project would be consistent with this guideline. Staff has proposed a condition of certification (**LAND-4**) that would require any proposed directional signs, identity signs, and gatehouses to comply with the North Coyote Valley Campus Industrial Area Master Development Plan.

General Development Plan Standards

The following standards are applicable to the project:

Most campuses should be planned at a size of at least 20 acres.

Consistency: The project would be developed on a 20-acre site, therefore it would be consistent with this standard.

The aggregate parcel coverage of all buildings exclusive of covered pedestrian walks and parking structures shall not exceed 30 percent.

Consistency: The proposed buildings and facilities would cover 26 percent of the site (Calpine/Bechtel, 2000d). Thus, the project would be consistent with this standard.

From site boundaries between Campus Industrial uses, but which do not abut public streets, the minimum setbacks shall be 100 feet for all buildings and structures and 15 feet for all uncovered off-street parking areas.

Consistency: The warehouse/maintenance shop, administration building (with control room), water treatment building/laboratory, and the gas compressor building are only setback 70 feet from the southern property boundary (Calpine/Bechtel, 2000d). The property adjacent and to the south of the MEC site is currently used for agriculture but is planned for Campus Industrial uses. Although the project would not be a Campus Industrial use, the heavy industrial nature of the project would warrant the full 100-foot setback for all buildings and structures. Therefore, the project would be inconsistent with this standard. Staff has proposed a condition of certification (**LAND-3**) that would require the applicant to design the project so that it would satisfy all applicable setback requirements. If the project were modified to comply with the condition, it would be consistent with this guideline.

From all boundaries that abut the existing Fisher Creek right-of-way, the minimum setbacks shall be 100 feet for all buildings and structures and 50 feet for all uncovered off-street parking areas.

Consistency: The setback from the Fisher Creek right-of-way for all proposed buildings, structures, and parking areas would be a minimum of 100 feet, so the project would be consistent with this standard.

All setback areas shall be landscaped.

Consistency: The project would be inconsistent with this standard. Two buildings (the PG&E switchyard control room and the Calpine/Bechtel switchyard control room) would interrupt a 10-foot high evergreen hedge proposed within the setback area along the eastern property line (Calpine/Bechtel, 2000b). These buildings are located six feet from the property line (Calpine/Bechtel, 2000d). Staff has proposed a condition of certification (**LAND-3**) requiring the applicant to design the project so that a 50-foot wide landscape easement would separate the property from the Union Pacific right-of-way. If the project were modified to comply with the condition, it would be consistent with this guideline.

A minimum of 25 percent of the total surface area of each parcel shall be landscaped. The Planning Director may allow the inclusion of natural open space in the project's landscaping area when he finds that such inclusion will: 1) meet the intent of the above requirement; 2) preserve significant natural amenities such as trees and terrain features; or 3) enhance the overall level of project quality.

Consistency: The proposed landscaping areas, which include the riparian plantings, would cover 62 percent of the site (Calpine/Bechtel, 2000d). Thus, the project would be consistent with this standard.

Off-street parking shall be provided at a ratio of one space per 350 square feet of gross floor area.

Consistency: The project would provide twenty on-site parking spaces (Calpine/Bechtel, 2000d). The proposed buildings on the project site would total 26,020 square feet of gross floor area. According to the required parking ratio, the project would need to provide 74 parking spaces. This is excessive for a project that would employ only 20 workers. Provision of one parking space per employee should be sufficient for this project.

All truck loading and unloading areas are to be separated from automobile parking areas and from all pedestrian and bicycle circulation elements.

Consistency: The ammonia unloading area would be separated from the automobile parking area. However, the warehouse/maintenance shop and water treatment building/laboratory are proposed to be adjacent to the automobile parking area. Trucks delivering replacement parts, equipment, and chemicals for storage at these buildings would be expected. In addition, the proposed project does not provide truck access to these buildings. Instead they would only be accessed via the automobile parking area. Therefore, the project would be inconsistent with this standard. Staff has proposed a condition of certification (**LAND-5**) that would require the applicant to design the project so that all truck loading and unloading areas are separated from automobile parking areas. If the project were modified to comply with the condition, it would be consistent with this standard.

Environmental Performance Standards

In the Planned Development zoning district, no primary or secondary use shall be so conducted as to cause the discharge of any waste material into or upon the ground, or the harmful discharge of any waste material into or within any sanitary or storm sewer system, into or within any water system or water, or into the atmosphere; and no use or activity shall be conducted or permitted which constitutes a menace to persons or property or which is dangerous, obnoxious, or offensive by reason of air pollution, odor, smoke, noise, dust, vibration, radiation, or fumes. In addition, no use shall be permitted or conducted where the same creates a public or private nuisance.

Consistency: The project would be inconsistent with this standard because it would discharge air pollutants into the atmosphere. It is not possible to modify the project to be consistent with this standard. Please see the **AIR QUALITY** section of the PSA.

The Master Development Plan establishes specific environmental performance standards addressing transportation, noise, water quality, flooding, cultural resources, air quality, and hazardous materials. Please refer to the **TRAFFIC AND**

TRANSPORTATION, **NOISE**, **SOIL AND WATER RESOURCES**, **CULTURAL RESOURCES**, **AIR QUALITY**, and **HAZARDOUS MATERIALS MANAGEMENT** sections of the PSA.

RIPARIAN CORRIDOR POLICY STUDY

The following guidelines are applicable to the project. Other applicable provisions are addressed in the **VISUAL RESOURCES, BIOLOGICAL RESOURCES,** and **SOIL AND WATER RESOURCES** sections of the PSA.

Guideline 1A: Orientation

Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges.

Consistency: The project would be inconsistent with this guideline. The ammonia unloading and storage area and noise generating equipment, such as the cooling tower and electrical switchyard, are oriented toward the riparian property edge. It may not be feasible from an engineering standpoint to modify the site layout to achieve conformity with this guideline. Compliance could require expansion of the project site to the southeast, increasing impacts to agriculture and requiring additional noise mitigation.

Guideline 1B: Incompatible Land Uses

Incompatible operations and activities are discouraged within and adjacent to riparian setback areas to protect the health of existing vegetation and wildlife, reduce adverse cumulative impacts to water quality, and protect the quality of recreation uses in the corridor. Incompatible land uses include the following: land uses which typically generate littering and/or dumping; off-road vehicle use; removal of native vegetation; and those uses that create noxious odors, or use, store or create toxic materials (including fertilizers, herbicides, and pesticides), or generate high volumes of vehicular traffic.

Consistency: The project would not create noxious odors. Operation of the project would generate an insignificant amount of vehicle traffic. The project would use and store aqueous ammonia, which is toxic and could have an adverse effect on wildlife in the event of an accidental release. However, the ammonia unloading and storage area would not be located adjacent to the 100-foot riparian setback area. All hazardous materials storage areas would include secondary containment. Therefore, the project would be consistent with this guideline.

Guideline 1C: Setback Areas

All buildings, other structures, impervious surfaces, outdoor activity areas, and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater).

Consistency: All proposed buildings, structures, impervious surfaces, and ornamental landscaped areas would be separated a minimum of 100 feet from the Fisher Creek riparian corridor, so the project would be consistent with this guideline.

Guideline 2F: Noise

Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.

Consistency: The project is expected to exceed the ambient noise level in the Fisher Creek riparian corridor by as much as 23 decibels (see the **NOISE** section of the PSA). As a result, the project would be inconsistent with this guideline. It is likely that the planned Campus Industrial uses would produce noise that would exceed the ambient noise level in the Fisher Creek riparian corridor, but not by as great of a margin as a power plant.

SANTA CLARA COUNTY

GENERAL PLAN

Growth and Development: Countywide Issues and Policies

Coyote Valley is one of the few remaining non-urbanized areas of high quality soils and large-scale agricultural land holdings in the County (Santa Clara County, 1994). As of 1980, the policies of the County's General Plan recommended that Coyote Valley should remain in agricultural or other non-urban uses. However, in 1983 the City of San Jose amended its General Plan to allow Campus Industrial development in the northernmost portion of Coyote Valley. The City designated the middle third and southernmost portions of Coyote Valley as "urban reserve" and "greenbelt" areas, respectively. The County's current policies recognize the need for flexibility regarding the future urban development of Coyote Valley (Santa Clara County, 1994).

Countywide - Growth and Development Policy 14 (C-GD 14): Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole, including:

a. development of industrial and commercial land use in South San Jose prior to further housing development in order to alleviate commute hour traffic congestion along major north-south routes;
b. reduced dependence on the automobile and increased use of public transit;
c. an increased variety of housing opportunities; and
d. opportunities for greenbelts.

Consistency: The proposed project is an industrial use and would be developed prior to development of the Coyote Valley Urban Reserve (CVUR). The CVUR is an area south of the North Coyote Valley Campus Industrial Area that may be considered for development in the future when the City needs additional housing

resources (San Jose, 1994a). Employees at the proposed power plant may have the opportunity to utilize public transit. Currently, two bus lines stop on Santa Teresa Boulevard near the site. In addition, the North Coyote Valley Campus Industrial Area Master Development Plan proposes several public transportation system upgrades, such as bus and light rail, within the vicinity of the MEC site (Calpine/Bechtel 1999c, p. 8.4-15). Parts c and d of this policy are not applicable to the project. Because the project would be developed prior to housing development in Coyote Valley, and because public transit opportunities exist, the project would be consistent with Policy C-GD 14.

C-GD 17: Planning for Coyote Valley's future development should provide for the following in the area of resource conservation:

a. permanent preservation of hillsides in open space;
b. retention of a greenbelt of non-urban uses and densities between San Jose and Morgan Hill; and
c. protection of a scenic corridor adjacent to Highway 101.

Consistency: The applicant proposes to permanently preserve Tulare Hill in open space, so the project is consistent with Policy C-GD 17. Part b is not applicable to the project. Consistency with part c is addressed in the **VISUAL RESOURCES** section of the PSA.

C-GD 18: Anticipated impacts on the South County cities [e.g., Morgan Hill and Gilroy] and other jurisdictions from development in Coyote Valley should be adequately mitigated to less than significant levels.

Consistency: At this time, staff cannot conclude that air quality impacts would be mitigated to a less than significant level, so the project would be inconsistent with this policy. Staff has proposed conditions of certification to reduce air quality impacts to a less than significant level. If the project were modified to comply with these conditions, it would be consistent with this policy. Please see the **AIR QUALITY** section of the PSA.

Land Use Policies: Rural Unincorporated Area Issues and Policies

Rural Land Use Policy 11 (R-LU 11): Allowable land uses in areas designated "Agriculture" shall be limited to:

a. agriculture and ancillary uses;
b. uses necessary to directly support local agriculture; and
c. other uses compatible with agriculture which clearly enhance the long-term viability of local agriculture and agricultural lands.

Consistency: The power plant site is designated Urban Service Area on the Santa Clara County Land Use Plan, so this policy does not apply to the power plant site. The proposed transmission line route is designated Am (Agriculture – medium scale) on the County Land Use Plan. The MEC's transmission line would connect to an existing transmission tower on Tulare Hill. Tulare Hill is currently used for

grazing cattle. The applicant proposes to continue grazing the hill for the life of the project. The transmission line would be compatible with grazing, so it would be consistent with this policy.

R-LU 74: In locating major gas and electric transmission distribution facilities, the primary environmental considerations shall be to minimize aesthetic impacts and to avoid developed residential and/or public recreation areas.

Consistency: The proposed gas pipeline would travel through the Coyote Creek Parkway. Thus, the project would be inconsistent with the County's policy to avoid public recreation areas. For information on the proposed gas pipeline's potential impacts on the Coyote Creek Parkway please see the COMPATIBILITY WITH EXISTING AND PLANNED LAND USES subsection of this analysis.

R-LU 75: Electric substations and gas control metering stations shall be located, designed, and landscaped to fit as inconspicuously and harmoniously as possible into the area in which they are required. Locations along scenic roads and heavily traveled highways should be avoided.

Consistency: The natural gas metering station would be located immediately adjacent to the PG&E gas main, just east of U.S. 101. Thus, the project would be inconsistent with the County's policy to avoid locating gas metering stations along heavily traveled highways. The decision to locate the metering station near the PG&E gas main instead of at the MEC site was made to preserve PG&E's option to construct, own, and operate the gas pipeline to the MEC site (Calpine/Bechtel, 2000f). The gas metering station would be classified as a "public utility and service use" in the Santa Clara County Zoning Ordinance. Santa Clara County allows public utility uses in any zoning district subject to securing a use permit. The Energy Commission has exclusive authority to permit the gas pipeline to the MEC, so a use permit from Santa Clara County will not be required. For information on the proposed gas metering station's potential impacts on travelers along U.S. 101 please see the COMPATIBILITY WITH EXISTING AND PLANNED LAND USES subsection of this analysis.

General Land Use Management: Urban Unincorporated Area Issues and Policies

This section of the General Plan addresses the issues of general land use management and development within unincorporated lands within the cities' Urban Service Area boundaries. Within a city's Urban Service Area, Santa Clara County does not apply any General Plan designation or classification of prescriptive land uses or densities to unincorporated parcels. Instead, allowable land uses and densities are determined by the applicable city's general plan.

In Santa Clara County, power plants are classified as "Major Public Utilities." Major Public Utilities are allowed in any zoning district with a conditional use permit. For any application for a use permit involving unincorporated land within a city's Urban Service Area, the County is required to provide the city with a form titled "General Plan Conformance and Contiguity / Annexation Statement." The form inquires of the city if the proposed use conforms to the city's General Plan and whether the city

intends to annex the site or whether annexation has been denied. The County could not approve a use permit for a project within the Urban Service Area that is inconsistent with the applicable city's General Plan (Shoe, 2000). Thus, if the City of San Jose finds the project inconsistent with its General Plan and denies the proposed amendment, the MEC could not be developed at the proposed site while the land is under Santa Clara County's jurisdiction.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

POWER PLANT

CONSTRUCTION PHASE

During construction of the MEC, 10 acres of an agricultural field south of the site would be temporarily disturbed for a construction laydown area. Approximately 4 acres of the laydown area would be used for parking and temporary facilities. This area would be needed for roughly 24 months during project construction. Of the remaining 6 acres, all or part of this area would be in use for a shorter duration. Using the land for a construction laydown area would temporarily preclude its use for agriculture. Calpine/Bechtel would lease the land to compensate the landowner for the value of any lost crop production (Calpine/Bechtel 2000a, data response #226).

In parking and heavy traffic areas and those areas used for temporary facilities, measures the applicant would take to preserve the existing agricultural soil include: covering the existing soil with a woven geotextile separator layer to protect underlying top soil; adding an additional layer of structural geogrid over the separator fabric in heavy traffic areas; and covering the geotextile layer with 8 to 12 inches of granular fill. To return these areas to their natural state after use, the granular fill and geotextile/geogrid would be removed and the soil would be tilled to thoroughly aerate. In those areas where heavy traffic protection is not required and soil conditions permit, no surface preparation would be taken and the laydown materials would be placed on appropriate wood dunnage. To return these areas to their natural state, the wood dunnage and materials would be removed and the soil would be tilled to thoroughly aerate (Calpine/Bechtel 2000a, data response #225). These mitigation measures are incorporated as condition of certification **LAND-6**.

Because the laydown area would only temporarily preclude agricultural production, and because the land would be restored to its original condition, the impact to agriculture would not be significant. Construction impacts, such as increased dust, noise, and traffic may affect nearby land uses. Please refer to the **AIR QUALITY** section of the PSA for a discussion of mitigation measures for controlling fugitive dust. Construction would be limited to daytime hours to reduce noise impacts on nearby land uses. Please refer to the **NOISE** section of the PSA for proposed mitigation measures. Construction traffic will increase congestion on local roadways; however, significant adverse impacts on the local transportation system are not expected. Please see the **TRAFFIC AND TRANSPORTATION** section of the PSA for a discussion of potential impacts and proposed mitigation measures.

Because agricultural uses predominate in the area surrounding the proposed site, the power plant would not disrupt or divide the physical arrangement of an established community.

All of the land on the MEC site is classified as Prime Farmland. Thus, 20 acres of prime agricultural land would be lost due to the development of the power plant, site access road, and buffer landscaping. Santa Clara County considers the loss of 10 acres of prime agricultural land to be a significant impact (Shoe, 2000). Therefore, development of the project would result in a significant adverse and unmitigable impact on agricultural resources.

The power plant site is located at the northern end of an approximately 1,440-acre area planned for Campus Industrial uses. Development of a power plant would preclude development of the site for Campus Industrial uses and introduce a heavy industrial use into an area not planned for such uses. The recently proposed Coyote Valley Research Park (CVRP) would be located south of Blanchard Road, west of Monterey Highway, and north of Bailey Avenue. The northernmost end of the CVRP would be approximately 1,250 feet south of the MEC site. Three farm properties immediately south of the MEC site would separate the power plant project from the proposed CVRP. A residence is located on one of these properties about 1,150 feet south of the MEC site (nearest sensitive receptor). These properties are also designated for Campus Industrial uses and would likely redevelop at some time in the future. However, they could remain in rural residential use for an indefinite period of time.

As currently proposed, the project would be designed so that noise from the power plant would not exceed 49 decibels at the nearest residence. The lowest ambient noise level at this residence is 38 decibels[10]. Staff considers an increase of five decibels over the lowest ambient noise level to be a significant adverse impact on sensitive noise receptors[11]. Thus, as proposed, the power plant would exceed the ambient noise level at the closest residence by as much as 11 decibels. This increase would be perceived as more than a doubling of the current noise level. Therefore, the project would have a significant adverse noise impact on the nearest sensitive receptor. The **NOISE** section of the PSA proposes a condition of certification to reduce this impact to an insignificant level. Noise impacts would be less than significant on the other sensitive receptors because they are located farther away, and in the case of the Santa Teresa neighborhood, Tulare Hill separates the neighborhood from the project site. Noise impacts from the project also would be insignificant on Campus Industrial workers. These workers would be within closed office buildings, which would reduce noise levels by approximately 10 decibels. Recreational use of a future trail along Fisher Creek would only occur during the day because the trail would be closed at night. Staff would not expect noise impacts on future recreational users of the Fisher Creek trail to be significant. During the day, when recreational users would be present, noise due to the power

[10] Thirty-eight decibels is the average of the quietest nighttime hours.

[11] An increase in noise of five decibels would be perceptible but not annoying.

plant would be noticeable but not annoying to people using the trail since ambient noise levels would be higher due to traffic on Monterey Highway. In addition, staff does not expect that those people using the trail would be exposed to the noise level for extended periods. Since the exposure period would be short, the impact would be less than significant.

Staff does not expect any significant adverse public health impacts from operation of the project. Please refer to the **PUBLIC HEALTH** section of the PSA.

Operation of the power plant would generate an insignificant amount of vehicle traffic and would not adversely affect the levels-of-service on roadways in the vicinity of the project. Please see the **TRAFFIC AND TRANSPORTATION** section of the PSA.

Staff has found that the MEC would have significant adverse and unmitigable visual impacts on nearby residences. The power plant would also have significant adverse and unmitigable visual impacts on future Campus Industrial uses to the south of the project site. Please refer to the **VISUAL RESOURCES** section of the PSA for a more detailed discussion of the project's potential visual impacts.

ELECTRICAL TRANSMISSION LINE

The proposed electrical transmission line between the power plant switchyard and the existing PG&E 230 kV transmission line would traverse undeveloped land. Thus, the proposed transmission line would not disrupt or divide the physical arrangement of an established community. The area is currently used for cattle grazing and is planned for agricultural uses. No new transmission towers would be constructed. Thus, the proposed transmission line would not preclude or unduly restrict existing or future land uses. It also would not convert any Prime Farmland to non-agricultural use. Therefore, the proposed electrical transmission line would be compatible with existing and planned land use.

NATURAL GAS SUPPLY PIPELINE

Construction of the natural gas supply pipeline would take about 3 to 4 months and is expected to occur during the summer of 2002. Construction within the Coyote Creek Parkway is expected to take approximately 5 to 7 weeks (Calpine/Bechtel, 2000e). Construction workers for the pipeline would park in the construction laydown area for the MEC site and would be transported to the pipeline route by bus or van. Most major pieces of construction equipment may remain along the pipeline route during the course of construction. The MEC site would serve as the primary location for storing pipe and other materials. Any additional storage locations would be in existing paved or graveled areas along the pipeline route (Calpine/Bechtel 1999a, p. 6-3). Staff has proposed a condition of certification (**LAND-7**) to ensure that additional storage areas for pipeline materials would be located within existing paved or graveled areas. Because the use of storage areas along the pipeline would be temporary, and with staff's proposed condition the project would not displace any existing use, so the impact would not be significant.

For the majority of the route, the pipeline would be installed using the trenching method. The exceptions are where it would be bored beneath U.S. 101 and directional drilled to go under Coyote Creek, Monterey Highway, and the UPRR tracks (Calpine/Bechtel 1999a, p. 6-3). Construction impacts, such as increased dust, noise, and traffic may affect nearby land uses. Please refer to the **AIR QUALITY**, **NOISE**, and **TRAFFIC AND TRANSPORTATION** sections of the PSA for a discussion of potential impacts and mitigation measures. Staff spoke with a representative of the Santa Clara County Parks & Recreation Department who indicated that their primary concern with the gas pipeline crossing the Coyote Creek Parkway would be potential disturbances to park users during construction (Killough, 2000). Large corporate events and family picnics are held at the Coyote Ranch during the months of April to October. To minimize potential disturbances to park users during construction of the pipeline through the Coyote Creek Parkway, staff has proposed a condition of certification (**LAND-8**) requiring the applicant to not conduct noisy and dusty pipeline construction activities while park events are occurring. In addition, the Santa Clara County Parks & Recreation Department would require Calpine/Bechtel to obtain an easement before crossing the Coyote Creek Parkway.

Except for the gas metering station, the natural gas supply pipeline would be underground for its entire length. Staff at the Santa Clara County Planning Department indicated that the primary concern with locating the gas metering station along U.S. 101 would be its potential visual impact to travelers on the highway (Shoe, 2000). County staff recommended using vegetation, such as oleander, to screen the metering station from travelers on U.S. 101. Please refer to the **VISUAL RESOURCES** section of the PSA for a discussion of the potential visual impact of the gas metering station and the mitigation proposed by staff. Because the site is vacant, as is the immediate vicinity, the gas metering station would not preclude any existing use, nor would it disrupt or divide the physical arrangement of an established community. The metering station site is classified as non-prime agricultural land (Calpine/Bechtel, 2000f). Thus, it would have an insignificant impact on agriculture. The gas pipeline would follow along existing roadways within the Coyote Creek Parkway and would travel within the area proposed for the power plant site access road and buffer landscaping. Therefore, once in place, the proposed natural gas supply pipeline would not preclude or unduly restrict existing or future uses. Thus, with staff's proposed condition of certification, the natural gas supply pipeline would be compatible with existing and planned land uses.

WATER SUPPLY AND WASTEWATER PIPELINES

The majority of the 10.2-mile long recycled water supply pipeline would be constructed in paved city streets within residential and commercial areas. Construction impacts, such as increased dust, noise, and traffic may affect land uses along the pipeline route. Construction would progress at such a rate that no single residence would be affected for more than a few days (Calpine/Bechtel 1999e, p. 3-5). Construction laydown areas would be located at existing paved areas or along rights-of-way (Calpine/Bechtel 1999e, p. 3-4). Please refer to the

AIR QUALITY, **NOISE**, and **TRAFFIC AND TRANSPORTATION** sections of the PSA for a discussion of potential impacts and mitigation measures.

Temporary impacts to agriculture may occur during construction of water pipeline Segment B-3 (recycled water supply pipeline, alternate domestic water supply pipeline, and wastewater discharge pipeline) and the domestic water supply pipeline. Construction would be timed to minimize disruption to agricultural activities (Calpine/Bechtel 2000a, data response #229). A portion of water pipeline Segment B-3 would pass through an orchard. The applicant would avoid direct loss of orchard trees by routing the pipelines between trees or through more open areas (Calpine/Bechtel 1999e, p. 3-3). Staff has proposed a condition of certification (**LAND-9**) requiring the applicant to avoid the direct loss of orchard trees as a result of the construction of the water pipelines. The owners of agricultural land affected by construction of the water pipelines would be compensated for the easement and value of any lost crop production. The level of compensation would be determined during the applicant's negotiations for easement rights with the individual landowners (Calpine/Bechtel 2000c, data response #231).

The pipelines would be installed using the trenching method. The excavated soil would be stockpiled on one side of the trench and used for backfilling after the pipe is installed so that loss of the original soil stratigraphy is minimized (Calpine/Becthel 1999a, p. 6-3). Staff has proposed a condition of certification (**LAND-10**) requiring the applicant to minimize the loss of the original soil stratigraphy as a result of pipeline construction through agricultural land. Standard erosion and dust control techniques, such as watering loose soil, would be used to minimize the loss of soil during construction of the pipelines. Please refer to the **AIR QUALITY** and **SOILS AND WATER RESOURCES** sections of the PSA for a discussion of proposed mitigation measures.

Because agricultural land disturbed during construction of the water pipelines would only temporarily preclude agricultural production, and because the land would be restored to its original condition, the impact to agriculture would not be significant. Water pipeline Segment B-3 and the domestic water supply pipeline would traverse lands under the control of the CVRP. Staff assumes that any potential conflicts between the pipeline routes and proposed buildings and structures on the CVRP site would be resolved during negotiations for easement rights.

Therefore, staff concludes that the water pipelines would be compatible with existing and planned land uses.

CUMULATIVE IMPACTS

The proposed MEC would contribute to the intensification of land use in North Coyote Valley. This trend is anticipated in the City of San Jose General Plan, which has designated approximately 1,440 acres of land in North Coyote Valley for Campus Industrial uses. The recently proposed Coyote Valley Research Park would be a 400-acre campus consisting of 6.6 million square feet of office, research and development, assembly, and light manufacturing uses. The MEC would be a

small component of the overall development of North Coyote Valley and would not contribute substantially to the intensification of land use in the area.

Staff is unaware of any other projects in the vicinity of the MEC that would cause cumulative conflicts with the City of San Jose General Plan, the North Coyote Valley Campus Industrial Area Master Development Plan, or the Riparian Corridor Policy Study.

The proposed MEC would have a significant adverse impact on agriculture in Santa Clara County because it would convert 20 acres of Prime Farmland to non-agricultural use. Development of the CVRP would result in the conversion of approximately 688 acres of Prime or Important Farmland (including a small portion designated as Grazing) to non-agricultural use. Therefore the MEC would contribute to a significant cumulative impact on agricultural resources.

FACILITY CLOSURE

At some point in the future, the project will cease operation and 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 planned lifetime of the project is 30 years (Calpine/Bechtel 1999a, p. 4-1). Prior to the initiation of decommissioning, the applicant would prepare a Facility Closure Plan for Energy Commission review and approval. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning activities with these LORS.

There are at least two other circumstances under which a facility closure can occur: unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the applicant would have to comply with in the event of unexpected temporary closure or unexpected permanent closure of the project.

MITIGATION

Staff has proposed conditions of certification to make the project consistent with some local policies and standards (**LAND-1** through **LAND-5**). To mitigate some impacts on agricultural land staff has proposed conditions of certification **LAND-6**, **LAND-7**, **LAND-9**, and **LAND-10**. To minimize potential disturbances to park users during construction of the natural gas supply pipeline through the Coyote Creek Parkway, staff has proposed a condition of certification (**LAND-8**) that requires the applicant to avoid conducting any construction activities while park events are occurring.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

The proposed MEC would be inconsistent with several applicable land use laws, ordinances, regulations and standards. The power plant site is currently designated Campus Industrial. This designation would not allow a power plant. A power plant is most appropriately defined as a "heavy industrial" use, which North Coyote Valley is not planned to accommodate. Thus, the project is generally inconsistent with the North Coyote Valley Campus Industrial Area Master Development Plan, which represents a statement of how the City of San Jose's General Plan is to be implemented in North Coyote Valley. The project also is inconsistent with several of the guidelines of the Master Development Plan and the Riparian Corridor Policy Study. Staff has proposed conditions of certification that would resolve some of these inconsistencies. To resolve the nonconformity with the San Jose General Plan, the applicant filed a General Plan amendment to change the land use designation of the site to Public/Quasi Public. A power plant would be consistent with the Public/Quasi Public designation. Staff anticipates that the City of San Jose will consider the land use entitlements necessary for development of the project (i.e., General Plan amendment, Rezoning/Prezoning, and Annexation) in summer 2000. The City of San Jose intends to use the Final Staff Assessment as its environmental document for compliance with the California Environmental Quality Act.

The MEC would not disrupt or divide the physical arrangement of an established community. With mitigation, staff has found that operation of the power plant would not cause significant adverse public health or traffic impacts on nearby land uses. With mitigation, the project would not have significant adverse noise impacts on planned Campus Industrial uses. With mitigation, the proposed linear facilities would not cause any significant land use impacts.

The project would have a significant and unmitigable adverse impact on agriculture because it would convert Prime Farmland to non-agricultural use. As proposed by the applicant, operation of the power plant would cause significant adverse noise impacts on the nearest residence. Staff has proposed a condition of certification to reduce this impact to a less than significant level. The power plant would have significant and unmitigable adverse visual impacts on nearby residences and planned Campus Industrial uses. Therefore, staff concludes that the power plant would be incompatible with existing and planned land uses in the vicinity.

RECOMMENDATION

Staff cannot recommend approval of the proposed MEC. If the Commission approves the project, the following conditions of certification should be adopted.

CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall install and maintain that portion of the Fisher Creek recreation trail that would cross the MEC site.

Protocol: The project owner shall submit to the CEC Compliance Project Manager (CPM) for review and approval designs for the recreational trail along Fisher Creek and a plan for trail maintenance. The submittal shall include a schedule for when the project owner intends to complete construction of the trail segment. The submittal to the CPM shall include evidence that the City of San Jose Departments of Planning and Public Works have reviewed the trail design and maintenance plan and shall attach and address any recommendations from the City of San Jose.

Verification: At least one hundred and eighty (180) days prior to the commercial operation of the power plant the project owner shall submit the designs and plan to the CPM for review and written approval.

Within seven (7) days after completion of the trail segment, the project owner shall notify the CPM that the trail segment has been completed and is ready for inspection.

LAND-2 The project owner shall landscape the parking area consistent with the "Orchard Planting" guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan. These standards are:

Provide an equally spaced orchard-like landscape planting in parking areas. Minimum standards are 1 tree for every 4 standard parking spaces and 1 tree for every 5 compact spaces.

Verification: At least ninety (90) days prior to the start of construction of the power plant, the project owner shall submit to the CPM a revised site plan demonstrating that the parking area is consistent with the North Coyote Valley Campus Industrial Area Master Development Plan guidelines.

LAND-3 The project owner shall design the project to meet all applicable setback requirements in the North Coyote Valley Campus Industrial Area Master Development Plan. These setback requirements are as follows:

From site boundaries between Campus Industrial uses, but which do not abut public streets, the setbacks shall be 100 feet for all buildings and structures and 15 feet for all uncovered off-street parking areas.

From all boundaries that abut the existing Fisher Creek right-of-way, the setbacks shall be 100 feet for all buildings and structures and 50 feet for all uncovered off-street parking areas.

A 50-foot landscape easement shall separate properties from the Union Pacific right-of-way.

Verification: At least ninety (90) days prior to the start of construction of the power plant, the project owner shall submit to the CPM a revised site plan demonstrating that the setback for all buildings and structures from the southern site boundary is a minimum of 100 feet.

Prior to the start of construction of any permanent buildings or structures on the power plant site, the project owner shall notify the CPM that these requirements have been satisfied and that the site is ready for inspection.

LAND-4 The project owner shall ensure that any project directional signs, identity signs, and gatehouses comply with the "Entry Identification" guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan.

Verification: At least ninety (90) days prior to the commercial operation of the power plant, the project owner shall submit to the CPM a site plan that demonstrates that the project complies with the "Entry Identification" guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan.

Prior to the start of commercial operation of the power plant, the project owner shall notify the CPM that these requirements have been satisfied and that any directional signs, identity signs, and gatehouses are available for inspection.

LAND-5 The project owner shall design the project so that all truck loading and unloading areas are separated from automobile parking areas.

Verification: At least ninety (90) days prior to the start of construction of the power plant, the project owner shall submit to the CPM a revised site plan demonstrating that all truck loading and unloading areas are separated from automobile parking areas.

Prior to the start of construction of any permanent buildings or structures on the power plant site, the project owner shall notify the CPM that this requirement has been satisfied and that the site is ready for inspection.

LAND-6 The project owner shall ensure the protection of soil while using agricultural land as a construction laydown and parking area. When the agricultural land is no longer needed as a construction laydown and parking area, but no later than the start of commercial operation of the power plant, the project owner shall restore the soil to its natural state for agriculture.

Protocol: In parking and heavy traffic areas and those areas used for temporary facilities, protective measures shall include but not necessarily be limited to: covering the existing soil with a woven geotextile separator layer to protect underlying top soil; adding an additional layer of structural geogrid over the separator fabric in heavy traffic areas; and covering the geotextile layer with 8 to 12 inches of granular fill.

After use, the granular fill and geotextile/geogrid shall be removed and the soil shall be tilled to thoroughly aerate and remove all soil compaction.

In those areas where heavy traffic protection is not required and soil conditions permit, laydown materials shall be placed on appropriate wood dunnage.

After use, the wood dunnage and materials shall be removed and the soil shall be tilled to thoroughly aerate and remove all soil compaction.

Verification: Within seven (7) days after the protective separator layers, wood dunnage, and granular fill have been applied, the project owner shall notify the CPM that the protective measures have been applied and shall submit photographic evidence of the application. Within seven (7) days after the agricultural field has been tilled, the project owner shall notify the CPM that the agricultural field has been tilled and shall submit photographs of the tilled field.

LAND-7 The project owner shall ensure that any additional construction laydown areas needed along all pipeline routes shall be located within existing paved or gravel areas.

Verification: At least sixty (60) days prior to construction of the pipelines, the project owner shall submit to the CPM a detailed map showing the location of any planned laydown areas along the pipeline routes and photographs of the areas.

LAND-8 For that portion of the natural gas supply pipeline within the Coyote Creek Parkway, the project owner shall avoid performing noisy and dusty construction activities while permitted park events are occurring. The project owner shall coordinate with the Santa Clara County Parks and Recreation Department to identify specific dates of planned park events in order to minimize conflicts with these events.

Verification: At least thirty (30) days prior to the start of pipeline construction through the Coyote Creek Parkway, the project owner shall submit to the CPM for review and approval a plan that describes how construction activities will be timed to avoid permitted park events. The submittal to the CPM shall include evidence that the Santa Clara County Parks and Recreation Department has reviewed the plan and shall attach and address any recommendations from the Parks and Recreation Department. The submittal shall also include a schedule of anticipated park events. Once a week during pipeline construction, the project owner shall submit to the CPM an update of planned construction dates for the following week and a schedule of planned park events to occur within the same timeframe.

LAND-9 The project owner shall route the water supply and wastewater discharge pipelines through open agricultural areas to avoid the direct loss of orchard trees.

Verification: At least sixty (60) days prior to construction of the water supply and wastewater discharge pipelines the project owner shall submit to the CPM for review and approval a site plan that shows the precise alignment of the pipelines in relation to existing orchard trees. The site plan shall clearly delineate the width of the pipeline construction corridor.

At least seven (7) days prior to ground disturbing activities related to pipeline construction, the project owner shall notify the CPM that stakes have been installed to delineate the boundaries of the pipeline corridor and the route is ready for inspection.

LAND-10 During pipeline construction, the project owner shall stockpile excavated topsoil separate from subsoil in agricultural areas. The project owner shall

backfill the trenches in a manner that minimizes the alteration of the original soil stratigraphy.

Verification: At least thirty (30) days prior to ground disturbance related to pipeline construction, the project owner shall submit a description of the procedure to minimize alteration of original soil stratigraphy. At least seven (7) days prior to trenching, the project owner shall notify the CPM of the schedule for trenching. Within seven (7) days after the start of trenching, the project owner shall submit photographs to the CPM that demonstrates that the topsoil has been kept separate from the subsoil. At least seven (7) days prior to the backfilling of trenches, the project owner shall notify the CPM of the schedule for backfilling.

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LAND USE Table 1
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	PROJECT CONSISTENT? (YES/NO)
City of San Jose General Plan	
Land Use Diagram - Campus Industrial Designation (Allowed land uses are industrial research and development, administration, marketing, assembly, and manufacturing.)	NO
Growth Management Major Strategy	YES
Greenline Major Strategy	YES
Sustainable City Major Strategy	YES
Residential Land Use Policy #2 (Residential neighborhoods should be protected from the encroachment of incompatible activities or land uses that may have a negative impact on the residential living environment.)	YES
Industrial Land Use Policy #1 (Industrial development should incorporate measures to minimize negative impacts on nearby land uses.)	NO
Urban Design Policy #2 (Private development should include adequate landscape areas, which utilize water efficient plant materials and irrigation systems and include provision for ongoing maintenance.)	YES (with staff's proposed condition of certification)
Urban Design Policy #11 (Maximum structure height of 95 feet in any area designated for Public/Quasi-Public uses; additional height allowed where substantial height is intrinsic to the function of the structures)	To be Determined
Trails and Pathways Policy #1 (The City should control land development along designated Trails and Pathways Corridors in order to provide sufficient trail right-of-way.)	YES
Trails and Pathways Policy #2 (When new development occurs adjacent to a designated Trails and Pathways Corridor, the City should encourage the developer to install and maintain the trail.)	YES (with staff's proposed condition of certification)

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

Trails and Pathways Policy #7 (Trails should be built to meet the trail standards established by the Department of Public Works.)	YES (with staff's proposed condition of certification)
Riparian Corridor Policy #2 (New public and private development adjacent to riparian corridors should be consistent with the provisions of the Riparian Corridor Policy Study.)	NO
Riparian Corridor Policy #3 (New development within the Urban Service Area should be set back from the riparian habitat a distance sufficient to buffer the impacts of adjacent human activities and provide avenues for wildlife dispersal.)	YES
Riparian Corridor Policy #4 (New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone.)	NO
North Coyote Valley Campus Industrial Area Master Development Plan	
General Intent of Master Development Plan (Represents a “clear and unequivocal” statement of how San Jose’s General Plan is to be implemented in North Coyote Valley. The area is intended to accommodate major “high technology” companies on large, single-user sites where they can consolidate their operations.)	NO
Private Improvement Guidelines	
Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan	To be Determined
Provide an equally spaced orchard-like landscape planting in parking areas.	NO (If the project were modified to comply with staff's proposed condition of certification, it would be consistent with this guideline.)
A 50-foot landscape easement will separate properties from the Union Pacific (formerly Southern Pacific) railroad right-of-way.	NO (If the project were modified to comply with staff's proposed condition of certification, it would be consistent with this guideline.)

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

Direction signs to major property entrances should be located not less than 100 feet from the intersection. Identity signs will be located on the entry drive median. Gatehouses must be located at least 50 feet from face of curb.	Insufficient information to determine consistency; would be consistent with staff's proposed condition of certification
General Development PlanStandards	
Most campuses should be planned at a size of at least 20 acres.	YES
The aggregate parcel coverage of all buildings exclusive of covered pedestrian walks and parking structures shall not exceed 30 percent.	YES
From site boundaries between Campus Industrial uses, but which do not abut public streets, the minimum setbacks shall be 100 feet for all buildings and structures and 15 feet for all uncovered off-street parking areas.	NO (If the project were modified to comply with staff's proposed condition of certification, it would be consistent with this standard.)
From all boundaries that abut the existing Fisher Creek right-of-way, the minimum setbacks shall be 100 feet for all buildings and structures and 50 feet for all uncovered off-street parking areas.	YES
All setback areas shall be landscaped.	NO (If the project were modified to comply with staff's proposed condition of certification, it would be consistent with this standard.)
A minimum of 25 percent of the total surface area of each parcel shall be landscaped.	YES
Off-street parking shall be provided at a ratio of one space per 350 square feet of gross floor area.	N/A

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

All truck loading and unloading areas are to be separated from automobile parking areas and from all pedestrian and bicycle circulation elements.	NO (If the project were modified to comply with staff's proposed condition of certification, it would be consistent with this standard.)
Environmental Performance Standards	
No primary or secondary use shall be so conducted as to cause the discharge of any waste material into the atmosphere.	NO
Riparian Corridor Policy Study	
Guideline 1A: Orientation (Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges.)	NO
Guideline 1B: Incompatible Land Uses (Incompatible operations and activities are discouraged within and adjacent to riparian setback areas to protect the health of existing vegetation and wildlife, reduce adverse cumulative impacts to water quality, and protect the quality of recreation uses in the corridor.)	YES
Guideline 1C: Setback Areas (All buildings, other structures, impervious surfaces, outdoor activity areas, and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater).	YES
Guideline 2F: Noise (Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.)	NO
Santa Clara County General Plan	
Policy C-GD 14 (Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole)	YES
Policy C-GD 17 (Planning for Coyote Valley's future development should provide for the permanent preservation of hillsides in open space)	YES

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

C-GD 18 (Anticipated impacts on the South County cities [e.g., Morgan Hill and Gilroy] and other jurisdictions from development in Coyote Valley should be adequately mitigated to less than significant levels.)	NO
R-LU 11 (Allowable land uses in areas designated “Agriculture” shall be limited to: a) agriculture and ancillary uses; b) uses necessary to directly support local agriculture; and c) other uses compatible with agriculture which clearly enhance the long-term viability of local agriculture and agricultural lands.)	YES
R-LU 74: In locating major gas distribution facilities, a primary environmental consideration shall be to avoid public recreation areas.	NO
R-LU 75: In locating gas control metering stations, locations along heavily traveled highways should be avoided.	NO

TRAFFIC AND TRANSPORTATION

Steven J. Brown, P.E.

INTRODUCTION

The Traffic and Transportation section of the Preliminary Staff Assessment addresses the extent to which the project may impact the transportation system within the vicinity of its proposed location. This section summarizes the analyses by Calpine Corporation and Bechtel Enterprises, Inc. (Calpine/Bechtel) in the Application for Certification (AFC) and the Energy Commission staff (staff) of the potential traffic and transportation impacts associated with construction and operation of the Metcalf Energy Center (MEC).

These analyses included the evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, they can increase roadway congestion and also affect traffic flow. The underground natural gas and water supply pipeline alternatives are proposed to cross or be located along a public right-of-way, requiring trenching or other activities disruptive to traffic flows. In addition, the transportation of large pieces of equipment can increase roadway congestion and increase traffic hazards. On-going (post construction) operations and maintenance traffic will be minimal; however, it can include a slight increase in the transportation of hazardous materials to the project site. In all cases, the transportation of hazardous materials will need to comply with federal and state laws.

Staff has used all available information to determine the potential for the MEC to have significant traffic and transportation impacts, and to assess the availability of mitigation measures that could reduce or eliminate 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

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

Sections 171-177 govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.

Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.

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 rights-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, 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, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Health and Safety Code, Sections 25160 et seq., addresses the safe transport of hazardous materials.
- California Vehicle Code, Sections 2500-2505, authorizes 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, addresses 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, Sections 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, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

In accordance with California state law, the County of Santa Clara has adopted a Congestion Management Plan (CMP) for all transportation facilities within the County. The CMP is overseen by the Santa Clara Valley Transportation Authority. The CMP states that:

- Level of Service D (LOS D) is to be achieved whenever practical; and

- Level of Service E (LOS E) represents the maximum vehicles per day that any roadway can serve and still meet the minimum acceptable standard on the CMP roadway system.

LOCAL

SANTA CLARA COUNTY

The Santa Clara County General Plan (1994), includes the following policies which are pertinent to the proposed project:

Policy C-GD 14: Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole, including:

- development of industrial and commercial land uses in South San Jose prior to further housing development in order to alleviate commute hour traffic congestion along major north-south routes;
- reduced dependence on the automobile and increased use of public transit;
- an increased variety of housing opportunities; and
- opportunities for greenbelts.

Policy C-GD 18: Anticipated impacts on the South County cities and other jurisdictions from development in Coyote Valley should be adequately mitigated to less than significant levels.

Policy C-GD 41: Cities should take maximum advantage of the development potential of their vacant land supply and underutilized industrial/commercial lands to achieve more balanced growth and development.

CITY OF SAN JOSE

The transportation and circulation element of the San Jose General Plan (1994) sets forth the following policies that are applicable to MEC project:

- The city's level of service standards for the state highway system and specific routes of regional significance shall be those standards adopted in the Santa Clara Congestion Management Program;
- The City shall require all new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase; and
- The California Streets and Highways code Division 2 Chapter 5.5 Sections 1460-1470 mandates that an encroachment permit be obtained from the City Public Works Department if there is an opening or excavation for any purpose in any highway.

SETTING

REGIONAL DESCRIPTION

The proposed MEC area is bonded by the south and east banks of Fisher Creek on the North, Blanchard Road on the south, Monterey Road/Union Pacific Railroad (UPRR) tracks on the east and west, and Santa Teresa Hills.

SITE AND VICINITY DESCRIPTION

The operating conditions of a roadway system are described using the term “level of service”. Level of service (LOS) is a description of a driver’s experience at an intersection or roadway based on the level of congestion (delay). However, it is not a measure of safety or accident potential. Intersection and roadway conditions can range from LOS A, representing free-flow conditions with little or no delay, to LOS F, representing saturated conditions with substantial delay.

The study roadways fall under multiple jurisdictions, including the City of San Jose, Santa Clara County, and Caltrans. Monterey Highway and portions of Bernal Road and Santa Teresa Boulevard) are identified to be in the County’s Congestion Management Plan (CMP). The CMP LOS standards take precedence for these roadway segments. A LOS D threshold, as noted above, is the preferred condition established in the County of Santa Clara Congestion Management Plan, but in no case should any roadway exceed an LOS E.

Tables 8.10-1 and Table 8.10-3 in the AFC summarize the existing and future LOS criteria and existing and future traffic volumes of the principal roadways in the project area. All local roadways are currently operating at LOS D or better. The Santa Teresa Boulevard at the Bernal Road/Avenida Espana intersection is projected to operate a LOS E, still acceptable within the CMP.

STATE HIGHWAYS AND LOCAL ROADWAYS

The major north-south roads in the area of the project site are Monterey Road, Santa Teresa Boulevard, U. S. 101, and State Route (SR) 85. Blanchard Road is a private road and is proposed to connect to the MEC site just west of the UPRR right-of-way.

Monterey Road passes through San Jose to the north of the MEC site and continues south through Gilroy. It runs parallel to, and between, the UPRR and U. S. 101. Monterey Road is classified as a four-lane divided arterial by the City of San Jose and as an Arterial Primary Urban (APU) by Santa Clara County for the portion that is in their jurisdiction. The road has 12 to 13-foot wide lanes, 6-foot paved shoulders, and left-turn lanes. The posted speed limit along Monterey Road is 50 miles per hour (mph). Average Daily Traffic (ADT) on Monterey Road is 22,575 vehicles, and the roadway operates at LOS C.

Santa Teresa Boulevard extends from San Jose to the north past the MEC site for a distance of approximately 2 miles where it becomes Hale Avenue. It is located to the west of the MEC site, and connects to Bernal Road approximately one and one

half miles north, providing access to U. S. 101. Santa Teresa Boulevard is classified as a minor arterial with two to four lanes within San Jose, and as APU by Santa Clara County over their portion south of the site. Santa Teresa Boulevard has 12 to 14-foot wide lanes, left-turn pockets, a 48-foot median, 9-foot paved shoulders, and striped and signed Class II bike lanes. The posted speed limit ranges from 45 to 50 mph. Average daily traffic ranges from 7,500 vehicles south of Bailey Avenue to 12,530 vehicles at Avenida Espana. The boulevard operates at LOS C and D in the two-lane portion, and LOS A in the four-lane portion.

Blanchard Road is a private road located about 3/4 mile south of Metcalf Road. There is a traffic light at the intersection. The proposed access road to the MEC site would connect to Blanchard Road just west of the UPRR.

U.S. 101, within Santa Clara County, crosses through eastern San Jose to the east, and connects with Interstates 880, 680 North, and 280 West. U.S. 101 is generally a 5 to 8-lane limited access freeway that narrows to 4 lanes north of Bernal Road (about 1 1/2 miles north of the MEC site) and continues about 6 1/2 miles south before it widens to 6 lanes. The posted speed limit on U.S. 101 is 65 mph. Average Daily Traffic is 77,770 north of Bernal Road, and 86,860 at the Bernal Road/Cochrane Road ramps. U.S. 101 operates at LOS C north of Bernal Road and LOS D near the Bernal Road/Cochrane Road ramps.

State Route 85, (West Valley Freeway), intersects U.S. 101 in the vicinity of Bernal Road. From this location, it extends west and then north to serve the western part of Santa Clara Valley. SR 85 is classified as a 4-lane freeway and includes two high-occupancy vehicle lanes. The posted speed limit is 65 mph. Average Daily Traffic is 28,280 at the U.S. 101/Bernal Road ramp and 43,935 west of Bernal Road. U.S. 101 operates at LOS B at the U.S. 101/Bernal Road ramp and LOS C west of Bernal Road.

The San Jose Streets and Transportation Department estimates citywide truck traffic to average 5 percent of total vehicular traffic

ACCIDENT HISTORY

Table 8.10-2 in the Application for Certification (AFC) provides the most recently available three-year (August 1995 through July 1998) accident history for State Highways (Caltrans 1998; San Jose Street and Traffic Department 1999). For roadway segments, accident rates are computed as the number of accidents per million vehicle-miles of travel (MVM). The MVM for selected roadways in the vicinity of the MEC range from a low of 0.4 on Santa Teresa Boulevard at the Bernal Road/Avenida Espana to a high of 1.8 on Santa Teresa Boulevard at Bernal Road/South of Baliey Avenue. When compared to statewide averages for comparable facilities (Caltrans, 1998), Santa Teresa Boulevard experiences a higher than average accident rate in the project vicinity while all other roadways are below the statewide average for similar facilities.

RAILWAYS

The UPRR operates active main line tracks that pass along the east border of the MEC site. The UPRR tracks parallel the west side of Monterey Road and are used by Caltrain for passenger service and by UPRR for freight service. During weekday commuting hours, Caltrain serves the South County, including Gilroy, San Martin and Morgan Hill, on a fixed schedule.

PUBLIC TRANSPORTATION

The Santa Clara Valley Transportation Authority (VTA) provides regional and local public transportation service and connections to other transportation systems including bus service, light rail transit (LRT), Caltrain, and Bay Area Rapid Transit (BART).

VTA operates an extensive network of local bus routes serving the urbanized portions of the county. These routes serve main arterial streets, neighborhoods/residential areas, shopping, schools, employment areas and other businesses. Approximately 80% of Santa Clara County residents are within a quarter mile of a transit route. Bus route 68 serves Santa Teresa Boulevard from downtown San Jose to Gilroy via the Blossom Hill Caltrain station and the Santa Teresa LRT station. Express bus 501 runs from Palo Alto to Bailey Road via the Santa Teresa LRT station.

Light rail service is provided 7 days a week, 24 hours a day. LRT vehicles operate every 10 minutes weekdays; every 15 minutes Saturdays and Sundays and holidays. The 34 LRT stations are served by numerous VTA bus routes, and 6,700 free parking spaces are provided at the 10 LRT stations in South San Jose. The current intra-county rail system consists of 21 miles of LRT, which extends from the Great America business area to the north, and to the Santa Teresa station in the south. The Santa Teresa station is located on SR 85 about 1 mile north of Bernal Road. It is the nearest LRT station to the MEC site.

Caltrain provides frequent train service between San Jose and San Francisco, including stops at Peninsula communities 7 days a week. Rail service is also provided between San Francisco and Gilroy using the UPRR tracks just west of Monterey Road. The Blossom Hill station, located on Monterey Road about 1.5 miles north of Bernal Road, is the Caltrain station closest to the project site. At its January 25, 2000 meeting, the County Board of Supervisors approved the Measure A Caltrain Improvement Plan. The approval paved the way for an increase to 86 weekday trains between San Jose and San Francisco no later than 2006. The increase will be a joint effort with the VTA.

From selected LRT stations (including the Santa Teresa station), VTA provides free shuttle service to and from work sites. VTA and BART provide paratransit services for passengers with special needs and disabilities.

Park-and-ride lots are provided throughout the area at LRT stations and are served by VTA buses. All Park-and-Ride lots can be used for carpool and vanpool passengers and most are served by Express Bus Routes. Many lots have special

passenger amenities such as shelters, transit schedules, and bicycle lockers. The Park-and-Ride lots nearest to the MEC site are located at the Blossom Hill Caltrain station on Monterey Road and adjacent to the Santa Teresa LRT station on SR 85. There are future plans to extend LRT down Santa Teresa Boulevard.

IMPACTS

POWER PLANT

CONSTRUCTION PHASE

COMMUTE TRAFFIC

Construction of MEC will take approximately 18 to 20 months. It is anticipated that construction workers required to build MEC will be drawn from the local labor pool. The construction workforce will provide for a peak of approximately 400 construction workers over a 2-year period. This workforce includes approximately 328 for the power plant & electric transmission line and approximately 71 for the water and gas pipeline. MEC will require and use the services of local firms for major maintenance and overhauls, plant supplies, and other support services.

Table 8.10-4 in the AFC indicates the worst-case expected number of trips generated by the MEC construction project. With a peak workforce of approximately 400, total daily vehicle trips will be 710 (including truck deliveries). Approximately 318 (including truck deliveries) of these trips will occur during the afternoon peak hour. Construction commute traffic during the morning was not addressed in the AFC due to the fact that construction workers will arrive prior to 7:00 a.m. U.S. 101, SR 85, Bernal Road, Santa Teresa Boulevard, Monterey Road, and Bailey Avenue are likely to be the primary roadways to access and egress the MEC site. Monterey Road and the proposed access road, or Santa Teresa Boulevard and the alternative access road, will experience the greatest volume of construction traffic. However, significant effects on the local transportation system are not expected from the construction activities at MEC for the following reasons:

- Noticeable impacts will be localized near the construction site due to the relatively small number of trips to be generated relative to the existing traffic levels. Table 8.10-5 shows projected current daily volume in 2002 and LOS on nearby roadways, and daily volumes and LOS under the worst case. The only segment that will experience a reduction in the LOS (with the proposed access road in place) is Monterey Road between Bernal Road and Bailey Avenue. The change from LOS C to LOS D still meets the CMP standard.

- Since the AFC addresses project impacts on roadway segments only, the Draft EIR for Coyote Valley Research Park (Cisco) was reviewed to determine the projected operation of intersections during the peak hours. Specifically, the “Background” condition was reviewed to determine the projected intersection operating conditions during the peak construction period for the MEC. The

"Background" condition includes approved, but not yet built or occupied, development projects in the vicinity of the MEC site. Under this condition, all nearby intersections are projected to operate at LOS D or better. Project traffic is not expected to significantly impact the morning peak hour intersection operations due to the fact that construction workers will arrive prior to 7:00 a.m. The AFC estimates that 318 trips (including truck deliveries) will occur during the afternoon peak hour. It is expected that U.S. 101, SR 85, Bernal Road, Santa Teresa Boulevard, Monterey Road, and Bailey Avenue are likely to be the primary roadways to access and regress the MEC site. None of the intersections along these routes are projected to operate worse than the CMP's LOS E standard; therefore, the assignment to MEC construction traffic to these intersections is not expected to cause a significant impact.

- The typical workday for construction workers begins at 7:00 a.m. and ends around 4:00 p.m. This limits the number of vehicles during peak hour traffic periods and thus helps reduce the potential traffic impacts.

- All vehicles will park off of public roadways in the staging and parking areas immediately south of the MEC site, although no specific location is given. Therefore, a parking and staging plan will be required to manage the on-site construction-period parking. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

Use of the alternative access road off Santa Teresa Boulevard will cause a portion of Santa Teresa Boulevard to function at LOS E during the afternoon peak hour, which is within the CMP standard. All other roadways would function at LOS D or better.

TRUCK TRAFFIC

The increases in construction traffic will consist mainly of deliveries of plant equipment and construction materials to the site. In total, approximately 4,146 deliveries are expected over the 18-20 month construction phase. This averages approximately 10 deliveries per weekday. Truck trips are estimated to be 25 per weekday during the highest month. The specific traffic impacts associated with the truck trips are included in the discussion of commute traffic above.

MEC is considering construction of a temporary rail spur from the existing UPRR tracks that run along the east side of the site for the shipment of heavy equipment. This would eliminate the need to transport heavy loads over city streets. In case the temporary rail spur in not constructed, a workable alternative was identified in San Jose approximately 10 miles from the MEC site. This alternative is a rail siding at the Evergreen team track located adjacent to Senter Road near Phelan Avenue. Transport route arrangements would be required with Caltrans, the City of San Jose, and Santa Clara County for permitting and escort, as applicable.

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. The potential impacts of the transportation of hazardous substances can be mitigated to insignificance by

compliance with federal and state standards established to regulate the transportation of hazardous substances. Conditions of certification that ensure this compliance are discussed later in this analysis.

The State Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to carry a manifest, available for inspection by the California Highway Patrol at inspection stations along major highways and interstates; and check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous waste spills.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol. For an in-depth description of the amount and type of hazardous materials that will be used during the operation of the facility, see the **Waste Management and Hazardous Materials** Section of the PSA.

Generally, only small quantities of hazardous materials will be used during the construction period. Section 8.12 of the AFC provides a description of these materials.

RAILWAYS

The issue of site distance for vehicles exiting the project site heading across the railroad tracks onto Monterey Road was raised as part of a data request. In the response, it was stated that the current alignment for the access road provides the maximum buffer space to the existing home on the Passantino property. A potential site distance problem occurs due to the elevation difference (approximately 4 feet) between the railroad tracks, the adjacent property and Monterey Road. In order to mitigate for this condition, Calpine/Bechtel is proposing a longer vertical transition along Blanchard Road approaching the railroad tracks to increase visibility and the installation of railroad crossing gates at the track crossing (See Attachments TT-191A and B for Data Request 191).

The railroad crossing for the access road to the MEC site is a private crossing of a roadway not maintained by a public authority; therefore, the railroad crossing is not required to have railroad grade crossing warning equipment (gates and signals). During the peak construction period, the MEC will generate approximately 25 truck deliveries per day, including some hazardous materials. The transportation and handling of hazardous substances associated with the MEC can increase roadway hazard potential at the railroad crossing. The handling and disposal of hazardous substances are addressed in other sections of this report. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. However, to ensure the safe transport of hazardous materials, railroad grade crossing warning equipment (gates and signals)

should also be installed. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

OPERATIONAL PHASE

COMMUTE TRAFFIC

The operational phase of the MEC Power Plant will generate approximately 38 trips per day to the facility. These include 14 trips by employees and 5 trips by management and vendors. As mentioned previously, there will be approximately 20 full-time employees working at the plant. However, as a result of rotating shifts (8 a.m. to 8 p.m. and 8 p.m. to 8 a.m.), only 10 personnel will commute during the afternoon peak on any workday.

TRUCK TRAFFIC

During plant operations, trucks will periodically deliver and pickup replacement parts and various types of chemicals. Table 8.10.6 shows the expected truck deliveries to the MEC site on a weekly and and monthly basis. On average, there will be two truck deliveries to the project site per day. Hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Division 14.3 Section 32105 of the Vehicle Code specifies that every driver of a vehicle transporting inhalation hazards shall avoid driving into or through heavily populated areas, congested highways, or places where crowds are assembled. Transporters must get a Hazardous Material Transportation License from the California Highway Patrol (CHP) prior to moving the material. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this report.

Table 8.10-7 of the AFC describes current and future afternoon peak hour volumes and LOS during the operation phase of the MEC project, including commute traffic from the site. The transportation effects associated with power plant operations will not be significant for the following reasons:

- Trips generated by non-plant personnel are expected to be minimal and would likely occur primarily during non-peak commute periods.

- Deliveries of hazardous materials will be limited and will be in compliance with all laws, ordinances, regulations and standards (LORS) governing hazardous materials.

LINEAR FACILITIES

Construction of the transmission lines is not expected to occur within the public right-of-way and is not expected to cause any traffic impacts.

Construction of the recycled water and industrial wastewater pipelines proposed in the AFC will cross 23 streets between the point-of-connection and the MEC site. These streets are identified under 8.10.2.2.2 of the AFC.

Construction of the domestic water pipeline would cross Emado Avenue, a gravel road. Modification of the Snell Avenue/Santa Teresa Boulevard recycled water supply route so that it conforms with SBWR's latest design (Metcalf Energy Center (99-AFC-3) Supplement A), will not result in any adverse impacts along the proposed route. In comparison with the Snell Avenue/Santa Teresa Boulevard route, the SBWR route is the same length and reduces use of the major local streets (which have heavy traffic flow, thicker roadway pavement sections, and crowded utility crossings).

The natural gas pipeline's proposed route would cross U.S. 101, Monterey Road, UPRR, and Blanchard Road.

The construction of the underground recycled water, domestic water pipeline and industrial wastewater pipelines could increase congestion for all roadways in which trenching is required within the established right-of-way. However, such impacts will be short-term. Most of these crossings will be trenched and through access will be provided at all times. Traffic will be either directed along one-half of the roadway or routed across temporary trench bridging. Access for emergency vehicles will be maintained during construction. Typically plating of roadways will be used to ensure emergency vehicle access and maintain reasonable levels of traffic flow. Use of typical signals, signs, or warnings will notify motorists of construction activity. Any exceptional need for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

The construction of the natural gas pipeline could increase congestion for all roadways in which trenching is required within the established right-of-way. Any exceptional needs for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

All road crossing construction activities will be in accordance with local, state, and federal regulatory requirements and specification. Adequate barricades and lights will be provided around excavations at crossings in accordance with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" and California Vehicle Code Section 21400. The use of the UPRR grade crossing at Blanchard Road will be in accordance with UPRR and California Public Utilities Commission (CPUC) requirements.

If either natural gas or water supply facilities are being constructed within or adjacent to a public roadway, then the traffic control plan should include provisions such that at least one lane of traffic flow is maintained in each direction or traffic flow is alternated by direction using flagmen. In addition, all pipeline construction should take place at night or on weekends to avoid traffic flow disruptions.

The operation of such facilities will not have an impact on area roadways except for short-term maintenance or unplanned difficulties. In either case, the impacts create traffic flow difficulties that are typically limited in duration and not significant.

CUMULATIVE IMPACTS

The AFC does not identify any off-site development projects in the south San Jose area that would generate additional traffic during the MEC construction phase. However, the area and surrounding region will likely continue to experience development during the 18 to 20-month construction period. Consequently, traffic volumes on Monterey Road, Santa Teresa Boulevard, Blanchard Road, U.S. 101, and State Route 85 will likely increase.

Staff has identified nine developments in various stages of approval or implementation throughout the south San Jose area in the vicinity of the MEC. They include: Coyote Valley Research Park (Cisco), the MEC Power Plant, a residential development located north of Metcalf Road and south of Basking Ridge Road, Hellyer Vista View I, Creekside Plaza, Lincoln Property Company Development, Stellex, Hellyer View, and Pepper Lane Development. These development projects are estimated to generate a total of 63,100 daily trips with 9,810 occurring during the morning peak hour and 8,980 occurring during the evening peak hour. In addition, there is expected to be a substantial amount of population growth in the City of San Jose and in Santa Clara County. This additional regional growth is expected to increase traffic two-percent per year on the regional roadway system for the next 20 years. Consequently, traffic volumes on the roadways in the vicinity of the MEC will likely significantly increase.

Construction of MEC will take approximately 18 to 20 months. The peak construction period is expected to occur during 2002. It is unlikely that the larger long-term projects, such as the Coyote Valley Research Park project will be significantly built-out, since the projects are not yet approved. The construction phase analysis presented in this Impact section provides the project impacts for this scenario.

The MEC's level of traffic generation will diminish between the construction and operational phases. Table 8.10-6 and 8.10-7 in the AFC indicates that the MEC is expected to add a total of approximately 38 daily vehicle trips during normal operations. Staff has estimated that the MEC is expected to add a total of four morning and four afternoon peak hour trips during normal operations. In addition, the MEC will add approximately four truck deliveries per week. The additional operational and maintenance trips generated by the MEC are not considered significant because they would account for less than one-tenth of one percent of the total added cumulative traffic of 63,100 daily trips.

Staff has also evaluated the MEC's impact on traffic conditions that would occur under a long-range cumulative condition that includes build-out of these and other projects, normally called a future growth condition in Santa Clara County. This condition also includes assumed improvements to the transportation network including the widening of U.S. 101 to six lanes, widening of Santa Teresa

Boulevard, and other major roadway improvements. The Draft EIR for Coyote Valley Research Park and other traffic studies referenced at the end of this section were reviewed to determine the projected operation of intersections during the morning and afternoon peak hours. Specifically, the "Future Growth Condition" was reviewed to determine the projected intersection operating conditions during the operation period for the MEC. Under this condition, all nearby intersections are projected to operate at LOS D or better, which meets the CMP LOS standard. As noted above, the MEC is expected to add a total of approximately 38 daily vehicle trips and a total of four morning and four afternoon peak hour trips during normal operations. The assignment of MEC construction traffic to these intersections is not expected to cause a significant impact during the "Future Growth Condition."

FACILITY CLOSURE

The anticipated lifetime of the power plant is expected to be in excess of thirty years. At least twelve months prior to the proposed decommissioning, the applicant shall prepare a Decommissioning Plan for submission to the Energy Commission for review and action. 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. The effects of project closure on traffic and transportation will be similar to those discussed for the project itself. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no conclusions can be drawn on the effects of project closure on traffic and transportation.

MITIGATION

The applicant has indicated its intention to comply with all LORS relating to the transport of oversized loads and the transport of hazardous materials. The applicant should also: 1) prepare a construction traffic control plan and implementation program, and 2) install grade crossing warning equipment (gates and signals) at the railroad crossing for the access road. In addition, the applicant will be committed to repairing roadways to original condition after construction is completed. The applicant should also manage the on-site construction-period parking. Staff has incorporated these measures into the proposed conditions of certification and is not requiring additional mitigation for traffic and transportation impacts.

COMPLIANCE WITH LORS

FEDERAL

The applicant has stated its intention to comply with all federal LORS. A condition to ensure compliance is included below. Therefore, the project is considered consistent with identified Federal LORS.

STATE

The applicant has stated its intention to comply with all state LORS. A condition to ensure compliance is included below. Therefore, the project is considered consistent with identified state LORS.

LOCAL

For operational employees, trip reduction measures could be employed. But, since the maximum number of employees assigned to any one shift is 25 full-time employees, trip reduction measures for this project will have an insignificant benefit.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

5. During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will increase congestion; however, significant effects on the local transportation system are not expected.
6. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.
7. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances.
8. Construction activities have the potential to damage local roadways. The applicant should be required to repair damaged roadways to their original condition.
9. Construction workers will park on-site.
10. To ensure the safe transport of hazardous materials, railroad grade crossing warning equipment (gates and signals) should also be installed.
11. The contribution of MEC construction or operational traffic to the cumulative impacts on local roadways and intersections will be less than significant.

LINEAR FACILITIES

Because their construction requires trenching within public road rights-of-way, the recycled and domestic water and industrial wastewater pipelines will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. The applicant will prepare a traffic control plan, which is required by the proposed Conditions for Certification. In addition, all development will take place in compliance with California Department of Transportation and City of San Jose limitations for encroachment into public rights-of-way. All pipeline construction should take place at night or on weekends to avoid traffic flow disruptions.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Santa Clara County limitation on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file until the start of commercial operation and for at least six months from the date of issuance.

TRANS-2 The project owner or their contractor shall comply with California Department of Transportation (Caltrans) and Santa Clara County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any encroachment permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months from the date of issuance.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed during both construction and operation of the facility.

Verification: The project owner shall include, in their Monthly or Annual Compliance Reports, copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Prior to the start of site preparation or earth moving activities, the project owner shall install railroad grade crossing warning equipment (gates and signals) at the railroad crossing for Blanchard Road in accordance with UPRR and local/federal agency design standards. The project owner shall submit design plans for the grade crossing warning equipment (gates and signals) to UPRR and the Public Utilities Commission (PUC) for review and comment, and to the Energy Commission Compliance Project Manager (CPM) and PUC for approval.

In the event that the railroad grade crossing warning equipment is not installed prior to the start of site preparation or earth moving activities, the project owner shall provide a flagman at the railroad crossing for all hours that construction-related traffic is using Blanchard Road, from the start of site preparation or earth moving activities for the MEC, until the railroad grade crossing warning equipment is installed.

Verification: At least four months prior to start of site preparation or earth moving activities, the project owner shall provide the design plans for the grade crossing warning equipment (gates and signals) to UPRR, appropriate agencies and the CPM. At least 15 days prior to start of site preparation or earth moving activities at the MEC, the project owner shall inform UPRR, appropriate agencies and the CPM whether the grade crossing warning equipment (gates and signals) is ready for inspection, and if the gates and signals have not been installed, the project owner shall inform the CPM of the arrangements that have been made for a flagman at the crossing.

TRANS-5 Prior to the start of site preparation or earth moving activities, the project owner shall consult with Santa Clara County and Caltrans and:

Prepare a construction traffic control plan and implementation program addressing the following issues for linear facilities:

- timing of pipeline construction (take place at night or on weekends to avoid traffic flow disruptions);
- signing, lighting, and traffic control device placement;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial properties; and
- emergency access;
- Prepare a construction traffic control plan and implementation program addressing the following issues for power plant construction:
- establishing construction work hours outside of the peak traffic periods;
- timing of heavy vehicle equipment and building materials deliveries; and
- off-street employee parking during construction.

Verification: At least 30 days prior to start of site preparation or earth moving activities, the project owner shall provide to Santa Clara County and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and implementation program.

TRANS-6 Following completion of construction of the power plant and all related facilities, the project owner shall repair roadways to original or as near original condition as possible.

Protocol: Prior to start of site preparation or earth moving activities, the project owner shall photograph Monterey Road between Metcalf Road and Blanchard Road and sections of public roadways that will be affected by water and wastewater pipeline construction. The project owner shall provide the CPM, Santa Clara County and Caltrans with a copy of these photographs. At least 60 days prior to start of site preparation or earth moving activities, the project owner shall also notify Caltrans about the schedule for project construction. The purpose of this notification is to

postpone any planned roadway resurfacing and/or improvement projects until after the MEC construction has taken place and to coordinate construction related activities associated with other projects.

Verification:

Within 30 days of the completion of project construction, the project owner will meet with the CPM, Santa Clara County and Caltrans to determine and receive approval for the actions necessary and a schedule to complete the repair of roadways to original or as near original condition as possible.

TRANS-7 Prior to start of site preparation or earth moving, the project owner shall prepare and submit a parking and staging plan for all phases of project construction to Santa Clara County for review and comment and to the CPM for approval. During construction of the power plant and all related facilities, the project owner shall manage the on-site construction-period parking.

Verification: At least 60 days prior to start of site preparation or earth moving, the project owner shall submit the parking and staging plan to Santa Clara County for review and comment, and to the CPM for approval.

REFERENCES

California Department of Transportation (Caltrans), 1997 Traffic Volumes on California State Highways, June 1998.

California Department of Transportation (Caltrans), TASAS Table B District 2 Selective Accident Rate Calculation, October 1999.

California Department of Transportation (Caltrans), 1998 Accident Data on California State Highways, May 1999.

California Department of Transportation (Caltrans), 1997 California State Highway Log, District 4, May, 1998.

California Department of Transportation (Caltrans), Traffic Manual, Chapter 5, Traffic Controls for Construction and Maintenance Work Zones. January 1996.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises) 1999a, Metcalf Energy Center Application for Certification (99-AFC-3). Submitted to California Energy Commission on April 30, 1999.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises) 1999b, Responses to CEC Data Request 69, 70 (Set 1A), Submitted to California Energy Commission on August 23, 1999.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises) 1999c, Responses to CEC Data Request 70 (revised) (Set 1c), Submitted to California Energy Commission on September 3, 1999.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises) 1999d, Responses to CEC Data Request 19, 20 (Set JW-1A), Submitted to California Energy Commission on September 16, 1999.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises), 1999e, Supplement A Submitted to California Energy Commission on October 1, 1999.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises), 1999f, Responses to Data Requests 14, 15 (Set JW-1B), Submitted to California Energy Commission on November 5, 1999.

Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises), 1999g. Responses to CEC Data Requests 185, 186 (Set JW-2). Submitted to California Energy Commission on November 29, 1999.

City of San Jose, San Jose General Plan, 1994

City of San Jose, Coyote Valley Research Park (CISCO) Draft EIR, 2000.

Hexagon Transportation Consultants, Pepper Lane Transportation Impact Analysis, 1999.

Hexagon Transportation Consultants, Hellyer View Transportation Impact Analysis, 1999.

Hexagon Transportation Consultants, Stellex Microwave Transportation Impact Analysis, 1999.

Santa Clara County, Santa Clara County General Plan, 1994.

NOISE

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INTRODUCTION

The construction and operation of any power plant creates noise, which is also defined as 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 sensitive receptors combine to determine whether a proposed project can be constructed and operated to meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental noise impacts.

The purpose of this analysis is to identify noise impacts from the construction and operation of the Metcalf Energy Center (MEC) project and to recommend conditions to ensure that the resulting noise impacts will comply with the applicable laws, ordinances, regulations and standards (LORS), and will not present a nuisance to the surrounding community.

Before certifying the MEC, the Energy Commission must find that the project:

will likely be constructed and operated in compliance with all applicable noise LORS; and

will present no significant adverse noise impacts, or none that cannot be mitigated to the fullest extent possible.

This analysis is based, in part, on information provided in the Application for Certification (AFC) (Calpine/Bechtel 1999a), supplemental filing (Calpine/Bechtel 2000a), site visits, workshops, staff data requests and applicant responses, and discussions with other agency representatives.

COMMON UNITS OF MEASURE

For a description of the terms used to describe noise and methods to measure and evaluate noise, please see “Noise: Appendix A” and Section 8.5.1 of the AFC. The following is a comparison of the statistical parameters used in the LORS, mainly the Leq, L50 and DNL, such that a meaningful comparison between the three can be made.

The Leq is the average A-Weighted noise level during a specified measurement period (for example, 15-minute or hourly). The L50 is the A-Weighted noise level that is exceeded during 50 percent of the measurement period (i.e., 30 minutes during an hourly measurement). For a constant noise source, such as a power plant operating in normal mode, the L50 and Leq are essentially equivalent.

The DNL (which is also referred to as: LDN, Ldn, or Day-Night Noise Level) is the A-weighted noise level during a 24-hour day calculated after addition of 10 dB to noise levels between 10:00 p.m. to 7:00 a.m. For a constant and continuous noise source, the DNL is 6 dB higher than the source level. For example, a 49 dBA

constant source level over a 24-hour period will have a DNL of 55 (49 dBA + 6 dBA).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 CFR § 1910.95) that establish maximum noise levels to which workers at a facility may be exposed. These 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 during which the worker is exposed. (Please see Noise: Appendix A, Table A4 immediately following this section.) OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements. The administering agency for the above authority is the Federal Occupational Safety and Health Administration (Fed-OSHA).

The Noise Control Act of 1972 (42 USC 6 4901 et seq. 40 CFR Parts 201-211) sets performance standards for noise emissions from "major sources." The U. S. Environmental Protection Agency (USEPA) has identified a day/night level (Ldn) of 55 dBA[1] as providing reasonable protection against community annoyance and activity interference due to noise. USEPA administers the Noise Control Act.

STATE

There are no state regulations governing off-site (community) noise. Rather, state planning law (Gov. Code, § 65300) requires that all counties and cities prepare and adopt a General Plan. Government Code section 65302(f) requires that a noise element be prepared as part of the General Plan. This element is to “address existing and foreseeable noise problems….” Other state laws, ordinances, regulations and standards (LORS) include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Act (Cal-OSHA).

California Vehicle Code, sections 23130 and 23130.5, sets noise limits for highway vehicles. The California Highway Patrol and the Santa Clara County Sheriff’s Office administer the vehicle code.

CAL-OSHA

California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations that set employee noise exposure limits.

[1] Please see **Noise: Appendix A,** immediately following this section, for the definition of dBA and other terms used throughout this report.

Cal-OSHA regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) are the same as the federal OSHA criteria described above. The criteria are based on a worker's noise level exposure over a specific time period. Maximum permissible worker noise exposure levels to protect against damage to the workers' hearing have been established. The administering agency is Cal-OSHA.

CEQA

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 applicable 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:

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.

Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels.

A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

LOCAL

MEC is to be developed on land that is partly in the City of San Jose and partly in Santa Clara County. The portion of the property within Santa Clara County is within the urban service area of San Jose and is proposed for annexation (1999a, AFC § 5.4.4.4.4). Table 1 summarizes the LORS for the various entities.

SETTING

The site is located in the central portion of the Santa Clara Valley, approximately seven miles northeast of the town of Morgan Hills. The site is directly adjacent to the west side of Highway 101, immediately east of Tulare Hill, between Metcalf Road to the north and Blanchard Road to the south. The nominal site elevation is 250 feet above mean sea level (MSL). The area around the project site can be characterized as mostly rural, with some nearby single family residences.

The nearest sensitive receptor, identified as location M1 in the AFC, is a single-family residence located approximately 1150 feet, on the west side of Monterey Road. Since sensitive receptors are within a 1-mile radius of the project site, mitigation measures are likely to be required to minimize noise impacts to these sensitive receptors.

For additional information regarding the site, setting and other project features, please see the Project Description section.

NOISE: Table 1
A summary of LORS for various entities

Regulatory Agency	Ordinance/Standard	Interpreted Standard	Comments
City of San Jose	The General Plan calls for commercial, industrial and other non-residential uses located adjacent to residential and public/quasi-public land uses to mitigate noise generation to meet the 55 DNL limit at adjacent sensitive receptors. However, the City has indicated that there is flexibility in applying this standard when the adjacent land uses are agricultural rather than residential. MEC will meet the City's indoor goal at the nearest residence.	Noise Element of City General Plan: Long-term noise goal of 55 DNL (49 dBA continuous) at adjacent sensitive receptors. Indoor goal of 45 DNL.	Current design parameters are not to exceed 49 dBA (55 DNL) at the nearest sensitive receptor (M1). Because the noise reduction afforded by any conventional home easily exceeds 10 dB, even when the windows are open, an exterior sound level of 55 DNL will automatically result in an acceptable interior sound level of 45 DNL or less. The actual noise standards that the City will require MEC to meet will be developed during the Planned Development Zoning Permit phase.
County of Santa Clara	Noise Ordinance (Sec. B11 192(l)(d)) states that "If the noise measurement occurs on a property adjacent to a different land use category, the noise level limit applicable to the lower land use category, plus five (5) dB, shall apply." Table B1 1-1 92 lists the 10:00 p.m. to 7:00 a.m. noise level for one- and two-family residential at 45 dBA. <u>Noise Element Of General Plan</u>: Within urban service areas, noise levels have been inventoried in the noise elements of the cities' general plans and the County recognizes this city data for decision regarding all lands within urban service areas, incorporated and unincorporated." (page 1-29).	Noise Ordinance: Applying the ordinance to a residential land use would require MEC to meet an L_{50} criteria of 50 dBA (45 dBA + 5 dBA) at the property line of the land receiving the noise. <u>General Plan</u>: According to the County's General Plan the "residential land use" standard does not apply. Furthermore it requires use of the City requirements.	MEC was designed not to exceed 49 dBA at the fence line of the closest residence. Therefore MEC will be designed to mitigate the impact to the closest residence. It should also be noted that MEC is located in the San Jose urban service area and has accepted annexation into the City of San Jose as a condition of its certification; therefore, although the County impacts are mitigated, City criteria will ultimately apply.
North Coyote Valley Campus Industrial Area Master Development Plan	Facilities located within the campus industrial area, the development plan contains a guideline of "55 L_{eq} eight-hour peak". In addition, the guideline recommends the octave band noise levels.	55 dBA L_{eq}	The plant will be designed not to exceed 49 dBA (L_{eq}) at the fence line of the nearest residence. The resulting octave band at the residence will meet the development plans guidelines.
CEC	The plant should not increase noise levels by more than 5 dBA above existing measurements of any other applicable LORS. The existing nighttime background measurements resulted in an L_{90} of 39 dBA on two consecutive nights. To limit the increase in nighttime noise to 5 dBA or a total of 44 (39 + 5) dBA, the plant will need to be designed to not exceed 44 dBA (44 dBA from the plant + 46 dBA background = 48 Dba combined) at the nearest residence	The allowable plant noise contribution is 44 dBA at the nearest sensitive receptor.	The plant will be designed not to exceed 49 dBA (L_{eq}) at the fence line of the nearest residence. However, the staff will require that the plant be designed to not exceed 44 dBA. The resulting octave band at the residence will meet the development plans guidelines.

AMBIENT NOISE SURVEY

The Energy Commission's power plant certification regulations require that noise measurements be made at noise-sensitive locations where there is a potential for an increase of 5 dBA or more over existing background noise levels during operation of a power plant.

The applicant performed noise level measurements for a period of 37 hours, beginning at 8:00 a.m. on March 15, 1999 and ending at 9:00 a.m. on March 17, 1999, at the nearest residential site west of Monterey Road, location M1. Noise level data was recorded in terms of hourly Leq, L10, and L90. Several 10-minute measurements were taken at each of the remaining monitoring locations during the 37-hour monitoring period. These spot measurements were taken in terms of Leq, L10, L50 and L90 at each location. For all locations, data were collected during nighttime hours to gain a representative sample at times when background noise levels would be the lowest.

NOISE SURVEY RESULTS

Results of the 37-hour sound level monitoring are shown on NOISE: Table 2 and results of the spot sound level monitoring are shown on NOISE: Table 3 below. Noise level recorded at location M1 represents existing conditions at the nearest sensitive receptor to the site. The lowest hourly nighttime L90 occurred between 1:00 and 2:00 a.m. on March 15, 1999 at 37 dBA. Typical hourly nighttime L90 levels ranged from 37 dBA to 53 dBA. The average nighttime (10:00 p.m.-7:00 a.m.) Leq, L10 and L90 were 57, 60 and 46 dBA respectively for March 16; and 55, 53 and 46 dBA, respectively for the night of March 17.

Noise levels recorded at locations M2 and M3 represent existing conditions at the closest residence east of Monterey Road and Encinal School, respectively. The dominant noise sources at these locations tended to be vehicular traffic along Monterey Road.

ANALYSIS

SIGNIFICANCE CRITERIA

The most stringent noise limitation required by any of the applicable LORS will be the controlling criterion in the design of the noise control features of the project. In this case, the County of Santa Clara Noise Ordinance (Sec. B11 192(l)(d)) states that "If the noise measurement occurs on a property adjacent to a different land use category, the noise level limit applicable to the lower land use category, plus five (5) dB, shall apply." Table B1 1-1 92 lists the 10:00 p.m. to 7:00 a.m. noise level for one- and two-family residential at 45 dBA. Applying the ordinance to a residential land use would require MEC to meet an L50 criteria of 50 dBA (45 dBA + 5 dBA) at the property line of the land receiving the noise.

The significance of a noise impact is also a function of the change or increase in noise levels over existing ambient noise levels at any noise-sensitive receptor. A

NOISE: Table 2
Hourly Noise Level at M1, the Nearest Residence to the Site

Date	Hour Ending	DNL Time Period	L_{eq}	L_{10}	L_{90}
3/15/99	9:01 p.m.	Day	57	53	45
3/15/99	10:01 p.m.	Day	64	66	44
3/15/99	11:01 a.m.	Night	48	51	41
3/15/99	12:01 a.m.	Night	64	68	37
3/16/99	1:01 a.m.	Night	43	45	38
3/16/99	2:01 a.m.	Night	42	45	37
3/16/99	3:01 a.m.	Night	45	49	38
3/16/99	4:01 a.m.	Night	44	47	38
3/16/99	5:01 a.m.	Night	46	48	43
3/16/99	6:01 a.m.	Night	55	54	49
3/16/99	7:01 a.m.	Night	60	58	53
3/16/99	8:01 a.m.	Day	61	67	50
3/16/99	9:03 a.m.	Day	60	65	47
3/16/99	10:03 a.m.	Day	51	54	46
3/16/99	11:03 a.m.	Day	61	53	45
3/16/99	12:03 p.m.	Day	51	54	46
3/16/99	1:03 p.m.	Day	53	54	48
3/16/99	2:03 p.m.	Day	52	54	48
3/16/99	3:03 p.m.	Day	56	55	49
3/16/99	4:03 p.m.	Day	60	66	51
3/16/99	4:57 p.m.	Day	61	59	53
3/16/99	5:57 p.m.	Day	60	60	54
3/16/99	6:57 p.m.	Day	64	59	53
3/16/99	7:57 p.m.	Day	58	57	50
3/16/99	8:57 p.m.	Day	68	68	47
3/16/99	9:57 p.m.	Day	63	58	46
3/16/99	10:57 p.m.	Night	50	53	44
3/16/99	11:57 p.m.	Night	57	48	40
3/17/99	12:57 a.m.	Night	60	57	39
3/17/99	1:57 a.m.	Night	44	47	39
3/17/99	2:57 a.m.	Night	44	47	37
3/17/99	3:57 a.m.	Night	44	47	40
3/17/99	4:57 a.m.	Night	48	51	43
3/17/99	5:57 a.m.	Night	55	54	48
3/17/99	6:57 a.m.	Night	59	59	53
3/17/99	7:57 a.m.	Day	58	58	54
3/17/99	8:57 a.m.	Day	60	67	51

NOISE: Table 3
Measured Noise Levels at M2 and M3 (dBA)

Measured Noise at M2, Nearest Residence East of Monterey Road							
Date	**Start**	**End**	**L_{eq}**	**L_{10}**	**L_{50}**	**L_{90}**	**Noise Source**
3/15/99	9:50 p.m.	10:00 p.m.	66	67	65	52	Traffic
3/16/99	2:58 a.m.	3:08 a.m.	61	60	38	34	Traffic, owl, frogs
3/16/99	8:20 a.m.	8:30 a.m.	79	84	76	63	Traffic
3/16/99	4:24 p.m.	4:34 p.m.	76	81	72	64	Traffic
Measured Noise at M3, Encinal School							
Date	**Start**	**End**	**L_{eq}**	**L_{10}**	**L_{50}**	**L_{90}**	**Noise Source**
3/15/99	10:08 p.m.	10:18 p.m.	63	66	62	50	Traffic
3/16/99	2:30 p.m.	2:40 p.m.	54	53	42	37	Traffic
3/16/99	8:05 a.m.	8:15 a.m.	68	72	65	57	Traffic
3/16/99	4:10 p.m.	4:20 p.m.	66	70	65	58	Traffic

project related increase of 5 dBA or greater is considered significant by Energy Commission staff.

NOISE IMPACTS ASSESSMENT

Noise will be produced at the powerplant site during the operation of the project, and at the power plant site and along the corridors for linear project features during the construction phase. This assessment includes impacts from both construction and operation activities and their potential effects at the nearest sensitive receptors, and to power plant operations personnel. An essential part of this assessment is a comparison of expected noise levels with acceptable noise levels presented in applicable LORS, and with existing background levels at noise-sensitive receptors.

CONSTRUCTION

Power Plant: Typical construction noise levels generated by equipment at the project site are given in NOISE: Table 4 below. The equipment type, equipment source level range, the maximum expected equipment to be used, and the worst-case cumulative effects (i.e., all equipment on at once and in one stationary location) are provided.

Major construction phases consist of site clearing and preparation, grading, foundation construction, building and equipment construction, site clean up and facility start-up. Noise emissions will vary with each phase of construction.

NOISE: Table 4
Construction equipment and composite site noise levels

Construction Phase	Construction Equipment	Equipment Noise Level (dBA)	Composite Site Noise Level @ 50 ft. (dBA)
Excavation	Pile driver Dump truck Rock drill	104 91 98	89
Concrete pour	Truck Concrete mixer	91 85	78
Steel erection	Derrick crane Jack hammer	88 88	87
Mechanical	Derrick crane Pneumatic tools	88 86	87
Clean-up	Truck Steam blow (unmuffled)	91 130 @ 100'	120

Source: EPA, 1971 and Barnes, 1976.

Steam Blows: Typically, the steam blows create the loudest noise, inherent in the construction of all projects incorporating a steam turbine. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path will have 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 connecting the steam system to the turbine, the steam line is temporarily routed to the atmosphere. Steam is then raised in the 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 piping. 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. The applicant anticipates performing the steam blow activities during the daytime hours for a period not to exceed 10 working days. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

Piles: Pile driving noise depends on the method used and, in the case of conventional impact driving, the force of each blow. For average impacts of 20,000 ft-lb or more, the likely noise level at the nearest residence will be approximately 74 dBA. Such a level would be unacceptable and clearly disturbing. Weaker impacts ranging from 12,000 to 18,000 ft-lb would generally produce a level of about 63 dBA at M1 and would still constitute a legitimate disturbance. In order to avoid this impact the project owner is evaluating alternative methods, such as sonic piling.

LINEAR FACILITIES

- The plant switchyard will be connected to the PG&E transmission system via a 200 feet of new 230-kV transmission line.

- Natural gas is conveyed to the power plant site via a new one-mile of 16-inch diameter supply pipeline. The pipeline will connect to an existing PG&E transmission backbone pipeline that runs along the eastern side of U.S. 101.
- A 20-inch, 7.3-mile pipeline will supply cooling water. The South Bay Water Recycling Program (SBWR) will supply the recycled water.
- Wastewater from the plant will be transported to San Jose's sewer system via a 12-inch pipeline. The recycled water and wastewater pipelines will be located in the same trench.
- Process make up water will be supplied from San Jose's municipal water system via a 1.25-mile pipeline.

Construction equipment for the linear facilities will travel along the route of these linear facilities; as such, the construction activities and associated noise will not impact any one location for an extended period.

COMMUNITY NOISE EXPOSURE (CONSTRUCTION)

Power Plant: Except for steam blow and pile driving activities, the anticipated construction noise emission levels and equipment usage for each phase of construction will result in noise levels at the nearest sensitive receptor that range from 46 to 49 dBA. These noise levels are anticipated to be faintly audible at the nearest residences and will not cause undue disturbances to local residents.

Steam Blows: Unsilenced steam blows (see NOISE: Table 4 above) far exceed any noise level standards at both M1 and M2. The applicant proposes to use a temporary blowout silencer to reduce this noise level. Such a silencer has an overall noise reduction of 40 to 45 dBA and would reduce the estimated unsilenced level at M1 from 99 dBA to about 59 dBA. Since it is common practice to only carry out these steam blows during the day, silenced steam blows should produce no significant disturbance.

Alternatively, the applicant may employ a new, quieter steam blow process, variously referred to as QuietBlow® or Silentsteam . This method uses lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet, equivalent to 45 to 50 dBA at the nearest residence. This noise level complies with the City of San Jose noise guidelines. Staff proposes a notification process (see proposed Condition of Certification NOISE-1 below) to make neighbors aware of impending steam blow activity.

Staff recommends that the one or more of the mitigation measures proposed above be used during the steam blow activity.

Other: Noise generated during the testing and commissioning phase is not expected to be substantially different from that produced during normal full load operation. Starts and abrupt stops are more frequent during this period but overall it is usually short-lived. The steam releases associated with these starts and stops should not be problematic since they will be vented through permanent vent silencers.

WORKER NOISE EXPOSURE (CONSTRUCTION)

Power Plant and Linear Facilities: A reference distance of 50 feet was used in the AFC to evaluate on-site construction noise levels and their potential impacts on workers. The noise levels will vary significantly depending on whether a worker is closer to or conducting a noisy activity, but the Leq levels are projected to average between 75 and 85 dBA during the first four phases of construction. Undoubtedly, some workers will occasionally be exposed to noise levels above 85[2] dBA during construction. The applicant predicts that construction noise levels will not reach levels that require worker protection, but will put in place the use of engineering controls, administrative controls, and hearing protection devices.

To ensure that workers are adequately protected, staff has proposed a condition of certification (see proposed Condition of Certification NOISE-3, below).

COMMUNITY NOISE IMPACTS (OPERATION)

During its operating life, the project will represent essentially a steady, continuous and broadband 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.

One possible source of noise annoyance would be strong tonal noises, individual sounds that, while not louder than the permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the MEC 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.

Another potentially annoying source of noise from a 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-4, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

It is expected that startup and shutdown of the power plant will generally not produce any transient noise loud enough to be perceptible at any of the sensitive receptors. The applicant proposes that compressor air bleed lines will be lagged and/or routed into the exhaust system for noise attenuation by the exhaust silencer.

In order to comply with the City of San Jose Noise Element, the plant will be designed to maintain a noise level of 55 DNL or less during normal full load operation at the nearest residential receptor; or, equivalently, a maximum continuous emission level of 49 dBA. These noise levels are anticipated to be

[2] OSHA does not consider noise levels of 85 dBA or less hazardous to employee health.

faintly audible at the nearest residences and will not cause undue disturbances to local residents.

STAFF PROPOSED MODIFICATION

From the noise survey results (see NOISE: Table 2) the lowest nighttime L90 noise level at the nearest sensitive receptors occurred between 1:00 and 2:00 a.m. on March 15, 1999 at 37 dBA. Typical hourly nighttime L90 levels ranged from 37 dBA to 53 dBA. These levels, however, were influenced by traffic noise from the nearby Monterey Highway, as evidenced by L10 values notably higher than background (L90) levels. In such a case, it is appropriate to average the L90 values throughout the nighttime hours. The applicant has done this, calculating an average L90 value between 10:00 p.m. and 7:00 a.m. of 46 dBA (Calpine/Bechtel 1990a AFC § 8.5.3.4).

Staff disagrees in part with this approach. Between 5:00 and 7:00 a.m., the background (L90) noise level is appreciably higher than other times of the night. For that reason, the noise levels between those hours were excluded from the nighttime averaging. With that exception, the background average nighttime noise levels were 39.5 dBA and 41 dBA on March 15 and 16,1999 respectively.

The CEC 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. Using an average nighttime noise level of 39 dBA, the project should be designed not to exceed a noise level of 44 dBA at the nearest sensitive receptor.

WORKER NOISE IMPACTS (OPERATION)

Typically, individual power plant equipment can be provided that does not exceed a mitigated sound pressure level of 85 dBA at 3 feet from the equipment face and 5 feet above the ground. However, noise levels in some areas within a power plant typically exceed 85 dBA due to the additive effect of all nearby equipment as well as the effect of sound reflection and reverberation. Special noise control measures, such as silencers, acoustical enclosures, or insulation and acoustical lagging, may be considered to reduce in-plant noise levels.

These noise controls, however, are not always practical for reasons such as maintenance access, heat buildup, space limitations, and safety. Therefore, noise levels in some areas may exceed a sound pressure level of 85 dBA. OSHA and Cal-OSHA noise exposure limits would be satisfied using hearing protection within areas exceeding this level. Staff has proposed measures (see proposed Condition of Certification NOISE-5, below) to ensure compliance.

MITIGATION MEASURES

Unmitigated operation of the proposed facility would result in property line noise levels that would not meet local LORS. Accordingly, mitigation of essential noise generating equipment, inlet air silencers and HRSG mufflers will be considered. Mitigation in the form of structural enclosure of key power production equipment will

be implemented. Primary areas targeted are turbine assemblies and synchronous generators.

Anticipated operation noise mitigation measures would also include the following, see NOISE: Table 5 below:

NOISE: Table 5
Preliminary Noise Mitigation Measures for Plant Operation

NOISE SOURCE	NOISE CONTROL
Combustion Turbine Generator Enclosure	Limit noise through purchase specification to 85 dBA at 3 feet. Block noise with large barrier walls just south of turbine enclosures supported from pipe rack structure.
HRSGs	Specify low-noise design, possibly including an inlet duct noise barrier shroud. Improved shell casing. Stack silencers.
Steam Turbine Generator	Limit noise through purchase specification to 85 dBA at 3 feet. Block condenser, air ejector and condensate pump noise with a barrier wall just south of the unit. Acoustical lagging on steam lines and valves.
Boiler Feed Pumps	Enclose in acoustically treated buildings.
Cooling Tower	Specify very low noise design. Special low rpm fan blades. Possible wet and/or dry inlet silencing.
Duct Burner Control Skids	Limit noise through purchase specification to 85 dBA at 3 feet.
Gas Compressor Building	Probable masonry construction with silenced ventilation openings.
Pipe Rack Steam Lines	Apply acoustical lagging as required.

Normal start-up and shutdown: Steam venting during normal hot and cold starts can create significant noise if the vents are improperly silenced. To prevent transient noise from exceeding the steady-state design level at any of the residences near the plant, the main steam vents on top of each HRSG will be specified so as to limit venting noise to a value equal to the plant design level of 49 dBA at M1. This considerable noise reduction that is likely to occur from meeting the silencer noise specifications should substantially reduce the likelihood of any disturbance during plant start-ups.

Except under emergency circumstances, there is typically little or no additional noise created during normal plant shutdowns.

FACILITY CLOSURE

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 project, 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 laws, ordinances, regulations and standards then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CUMULATIVE IMPACTS

The cumulative impacts discussion for the MEC is based on CEQA and the CEQA Guidelines which require that the discussion of cumulative impacts be "guided by the standards of practicality and reasonableness" (Public Resources Code (PRC) §21083(b)); and that "the discussion include a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts" (California Code of Regulations (CCR) §15130(b)(1)(A)). The CEQA Guidelines require that cumulative impacts are discussed when they are significant, and that the discussions of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. However, the Guidelines state that the cumulative impacts discussion need not be provided in as great detail as is provided for the proposed project.

Therefore, the purpose of this analysis is to:

- Identify past, present, and reasonably foreseeable actions in the project area that could combine with noise at the MEC.
- Determine if the impacts of the MEC and the other actions would overlap in time or geographic extent.
- Determine if the impacts of the proposed project would interact with, or intensify, the impacts of the other actions.
- Identify any potentially significant cumulative impacts.

Projects identified for consideration in this discussion of cumulative impacts include those where an application (1) has been submitted to local jurisdictions for required approvals and permits; and/or (2) that has been previously approved and may be implemented in the near future.

For this discussion of cumulative impacts, the general geographic area of influence is defined as an approximate 1-mile radius around the power plant, or within ½-mile of the linear facilities. The following projects fall under the above criteria.

Coyote Valley Research Park (CISCO)

The following information is from the Planned Development Rezoning Application and the Notice of Preparation (July 1999) and Draft Environmental Impact Report (EIR) (February 2000) for the project.

- Located on both sides of Santa Teresa Blvd., north of Bailey Ave. and south of Tulare Hill and Blanchard Rd.; northern end of the CISCO site is about 0.25 miles south of MEC.
- CISCO applied for a Planned Development Rezoning on 6/17/99. Proposed land uses are office, research and development, and light assembly facilities.
- 688 gross acre site; 6.6 million sq. ft. of building space on approx. 385 acres; building height up to 120 feet; the project will also include a 269-acre flood control basin and open space area, an electric power substation and other infrastructure improvements.
- Project will employ approx. 20,000 employees upon full buildout.

> In terms of a construction schedule for this project, a best case scenario would be zoning approval in Spring 2000, with construction beginning Summer 2000).

For the purposes of this Project, a noise impact is considered significant if the project will cause a substantial noise increase (greater than 3 dBA) adjacent to an existing or planned residential uses or other sensitive receptors. The information contained in the EIR indicates that this Project is likely to cause a significant noise increase to the nearby sensitive receptors. Staff will analyze the noise impact from the Project and provide its conclusions in the Final Staff Assessment (FSA).

Coyote Valley Urban Reserve (CVUR)

In the City of San Jose's comment letter on the AFC (August 18, 1999), the City stated that the analysis of the MEC should address potential impacts on future development of the CVUR. The following summary information is from the City of San Jose 2020 General Plan.

- Located south of the North Coyote Valley Campus Industrial Area (NCVCIA); the majority of the CVUR is south of Bailey Ave., about 2 miles south of MEC, but a portion of the reserve extends northward (on the east side of Monterey Highway) about 0.5 miles south of MEC.
- Projected to contain as many as 20,000 to 25,000 housing units
- Development of area is long-term in nature. According to the current General Plan (adopted in 1994), urban development is expected outside the timeframe of the Plan (2020).
- Development of the area is dependent on prerequisite conditions, such as the addition of 5,000 new jobs in the NCVCIA.
- No residential development will be allowed in this area until a Specific Plan is prepared.

Residential Development

- Located north of Metcalf Rd. and south of the southerly terminus of Basking Ridge Road, and east of Hwy. 101; within 1 mile of MEC.

- 131 single-family detached units on an approx. 142 acre site (28 developable acres); applied for Planned Development Rezoning (9/1/99) from R-1:B-3 Residential District (single family, minimum 1-acre lots).
- Estimated population: 356
- Project requires preparation of an EIR, which has not been completed yet Buikema 1999, pers. comm.)

Please note: resolution of cumulative analysis to be included in the FSA.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that if the MEC incorporated staff's proposed modifications, the project will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the MEC will likely present no significant adverse noise impacts to the surrounding community.

Conclusions regarding cumulative impacts will be included here after the analysis is completed.

RECOMMENDATIONS

Staff recommends the conditions of certification proposed below be included in the Commission Decision.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of construction (defined as start of rough grading) of the MEC and again at least 15 days prior to the commencement of the steam blow activity, the project owner shall notify all residents within a 1-mile radius of the project site, by mail or other effective means. 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 MEC. 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 also be posted at the MEC site during construction in a manner visible to passersby. This telephone number shall be maintained until the MEC has been operational for at least one year.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first monthly construction report following the start of rough grading, a statement signed by the project manager attesting that the above notification has been performed, describing the method of that notification, and including a sample letter, poster or other notice, as appropriate. This statement

shall also attest that the telephone number has been established and posted at the power plant site.

In the monthly construction report following the steam blow activity, the project owner shall transmit to the CPM a statement signed by the project manager attesting that, at least 15 days prior to the commencement of the steam blow activity, a notification was send to all residents within a one-mile radius of the project. The report shall include a description of the method of that notification.

NOISE-2 Throughout the construction and operation of the MEC, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner shall:

use the Noise Complaint Resolution Form (see below for an 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;
take all feasible measures to reduce the noise at its source if the noise is project related, and
submit a report documenting the complaint and the actions taken. The report shall include a complaint summary and the results of noise reduction efforts; and if obtainable, a signed statement by the complainant, stating that the noise problem is resolved to 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 City of San Jose 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 construction of MEC, 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 standards.

Verification: At least 30 days prior to the start of rough grading 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 COMPLAINT RESOLUTION FORM

Metcalf Energy Center
(99-AFC-3)

NOISE COMPLAINT LOG NUMBER _____

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).

NOISE-4 Upon the MEC 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 dominant source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints. The noise contributed by the MEC operation at the nearest residence shall not exceed 44 dBA Leq (night) under normal operating conditions including startups and shutdowns. If the results from the survey indicate that power plant noise levels are in excess of 44 dBA Leq (night) at the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

Protocol: The measurement of power plant noise for purposes of demonstrating compliance with this Condition may alternatively be made at an acceptable location closer to the plant (e.g. 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the nearest sensitive receptor. However, notwithstanding the use of this alternative method for determining the noise level, the character of plant noise shall be evaluated at the nearest sensitive receptor to determine the presence of pure tones or other dominant sources of plant noise.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to City of San Jose and the CPM. Included in the report will 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. 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-5 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within thirty (30) days after the facility is operating at an output of 80% of rated capacity or greater, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. 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 state 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 upon request.

NOISE-6 Construction and construction related activity (that which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the hours of: 7 a.m. to 7 p.m. on weekdays and from 8 a.m. to 6 p.m. on weekends and holidays.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement certifying that the above restrictions will be observed throughout the construction of the project.

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NOISE: APPENDIX A

FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

Noise levels can be measured in a number of ways. One common measurement, the equivalent sound level (Leq), is the long-term A-weighted sound level that is equal to the level of a steady-state condition having the same energy as the time-varying noise, for a given situation and time period. (See NOISE: Table A1, below.) A day-night (Ldn) sound level measurement is similar to Leq, but has a 10 dB weighting added to the night portion of the noise because noise during night time hours is considered more annoying than the same noise during the day.

NOISE TABLE A1
DEFINITION OF SOME TECHNICAL TERMS RELATED TO NOISE

Terms	Definitions
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.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} 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.	

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.

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:

NOISE Table A3
Addition of Decibel Values

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 ± 1 dB.	

Source: Thumann, Table 2.3

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

RELATIONSHIPS

$L_{dn} = 10 \log (1/24)[15x10^{(Ld/10)} + 9x10^{(Ln+10)/10}]$

Note: the 10-dB weighting added to the nighttime noise level. Daytime and nighttime are 15 hours (0700~2200 hrs) and 9 hours (2200~0700 hrs) respectively. L_d and L_n are the L_{eq} values over the 15 and 9 hours respectively. L_{dn} does not contain any consideration for tonal sounds, since it is derived from L_{eq} measurements.

CNEL is essentially the same as L_{dn}, except that different time segments are used in computation. The 24-hour period is divided into three segments instead of two. The day period (0700~1900 hours), evening (1900~2200 hours) and night (2200~0700 hours). The evening period is assigned 5-dB weighting and the nighttime is assigned 10-dB weighting. The extra 5 dB weighting during the evening results in higher values for CNEL that L_{dn}, but the difference is not statistically significant.

NOISE ATTENUATION

$[L_p]$ (at x = r) = $[L_p]$(at r = y) – 20log(x/y).

Where: x = distance to point where noise level is to be determined.
y = reference point.

$\Delta_{Loss} = 20\log (x/y)$.

Special case where x = 2y
$\Delta_{Loss} = 20\log (2y/y) = 20\log (2) = 6$

∴ As we double the distance, from a point source in free space, the noise level decreases by 6 dB.

VISUAL RESOURCES

Joe Donaldson, ASLA

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed project and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project would cause significant adverse visual impacts for some views. Some of these significant adverse visual impacts would be mitigated to less than significant levels by implementation of mitigation measures identified in this analysis and some of these impacts require discussion with the applicant and City of San Jose regarding possible mitigation. Several adverse visual impacts would be significant and unmitigable. Adverse visual impacts are determined to be significant and unmitigable for views from the Blanchard Road area, northbound passenger trains, southbound Monterey Road and the railroad, and the future trail corridor at Fisher Creek; potentially significant and mitigable for lighting and some construction impacts; and significant for cumulative impacts. Also, the proposed project would conflict with several local policies regarding visual resources that are part of applicable laws, ordinances, regulations, and standards.

INTRODUCTION

The purpose of this analysis is to determine whether the proposed Metcalf Energy Center project would cause significant adverse visual impacts, including whether the project would be in conformance with applicable laws, ordinances, regulations, and standards pertaining to visual resources.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- describes staff's analysis methodology;
- describes applicable laws, ordinances, regulations and standards;
- assesses the visual setting of the proposed power plant site, including linear facility routes;
- evaluates the visual impacts of the proposed project on the existing setting;
- evaluates compliance of the project with applicable laws, ordinances, regulations, and standards; and
- recommends measures needed to mitigate any potential significant adverse visual impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.

METHODOLOGY

Staff's methodology for assessing visual impacts is described below and includes a description of the approach and process, the criteria, and the basis for the criteria used in evaluating the impacts of the proposed project.

APPROACH AND PROCESS

Visual resources are the natural and cultural features of the environment that can potentially be viewed. The evaluation of existing conditions of visual resources requires the application of a process that objectively identifies the visual features, or resources, of the landscape; assesses the character and quality of those resources relative to overall regional visual character; and identifies the importance to people (i.e., visual sensitivity) of views of visual resources in the landscape. With this preliminary establishment of the baseline (existing) condition, a proposed project or another change to the landscape can be systematically evaluated for its degree of impact. The degree of impact depends on both the magnitude of change to the visual resource (i.e., visual character and quality) and viewers' concerns for and responses to those changes. This general process is similar for all established federal procedures for visual assessment (Smardon et al. 1986)**{**tc "(Smardon et al. 1986)" \f C \l 1**}** and represents a suitable methodology for visual assessment for other non-federal projects and areas.

The approach for this visual assessment is based on the Federal Highway Administration's (FHWA's)**{**tc "the Federal Highway Administration's (FHWA's)" \f A \l 1**}** visual impact assessment system (Federal Highway Administration 1983)**{**tc "(Federal Highway Administration 1983)" \f C \l 1**}** in combination with other established visual assessment systems. The visual impact assessment process for this project involves identification of the following:

- applicable laws, ordinances, regulations, and standards for protection of visual resources;
- visual resources and their visual character and quality in the region and around and at the project site, including linear facility routes;
- general visibility of the project area and site and important viewing locations (e.g., roads, residential areas, and public use areas);
- visual sensitivity based on viewer groups' concerns for visual resources (i.e., viewer sensitivity), the proximity of viewers to the project site, and other factors such as duration and frequency of views;
- significance criteria for visual impacts;
- visual impacts of the proposed project and their levels of significance; and
- mitigation measures that would reduce impacts to less-than-significant levels.

Data used in conducting this visual assessment were gathered from existing local government policy documents, documents prepared by the applicant for this project, and field visits to the project area and site. It should be noted that the analysis relies

heavily on the data, including photographs, maps, and written information, provided by the applicant for this project.

CRITERIA FOR VISUAL ASSESSMENT

The visual character and quality of the region and the project site are evaluated using established FHWA criteria for visual landscape relationships. These criteria are vividness, intactness, and unity. They are defined as follows:

- Vividness is the visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape. (Federal Highway Administration 1983.)

For this analysis, the appearance of the landscape is described using these criteria and the elements of form, line, color, and texture. These elements are the basic components, or attributes, of landscape character and are used to describe visual character and quality for most visual assessments (U.S. Forest Service 1974, U.S. Forest Service 1995, Federal Highway Administration 1983, Smardon et al. 1986).

Visual sensitivity is based on a combination of viewer sensitivity (i.e., the sensitivity of particular types of viewer groups based on their expectations and concerns for visual resources) and the visibility of resources in the landscape based on their proximity and elevational and directional position relative to viewers, the frequency and duration of views, and the number of viewers. Generally, visual sensitivity increases with higher viewer sensitivity, an increase in total numbers of viewers, higher frequency of viewing (e.g., daily or seasonally), and longer duration of views (i.e., how long a scene is viewed). For views by people with high viewer sensitivity, visual sensitivity is generally high for foreground views and moderately high for middleground views.

Viewer sensitivity is generally high for residents with views from in and around their homes; people who are traveling for pleasure; and people engaging in recreational activities (e.g., hiking, biking, picnicking, camping, boating, and fishing). In general, viewer sensitivity is high for people using recreation trails and areas, scenic highways, and scenic overlooks. Also, viewer sensitivity would be generally high for people working in a high quality work environment (e.g., the planned North Coyote Valley Campus Industrial Area). Viewer sensitivity tends to be lower for people driving as part of their work and can be lower for people traveling to and from work (U.S. Forest Service 1974, Federal Highway Administration 1983, U.S. Soil Conservation Service 1978).

The visibility of objects, visual resources, and other visual elements in the landscape is based in part on the position and speed of travel of viewers relative to the elements. Visual elements located more directly in front of traveling viewers (i.e.,

within their primary field of view or view cone) tend to be more noticeable and take on greater importance. The slower the speed of travel, the wider the traveler's primary field of view often becomes. Fields of view for passengers tend to be broader than for drivers of vehicles. Also, the visibility of visual elements depends on the number of viewers and the frequency and duration of views.

Visibility is also based on the proximity of the elements to viewers. Generally, the closer an element is to the viewer, the more dominant it is and the greater is its importance to the viewer. A viewshed is an area of the landscape that is visible from a particular location (e.g., an overlook or residence) or series of points (e.g., a road, trail, or water body). To identify the importance of views of resources and other elements, a viewshed may be broken into distance zones of foreground, middleground, and background. Although distance zones in viewsheds may vary between different geographic regions or types of terrain, a commonly used set of criteria identifies the foreground distance zone as the area from the viewer to 1/4- to ½-mile from the viewer, the middleground zone as extending from the foreground zone to 3-5 miles from the viewer, and the background zone as extending from the middleground zone to infinity (U.S. Forest Service 1974)**{**tc "(U.S. Forest Service 1974)" \f C \l 1**}**. Also, visual resources and other elements that are higher in elevation than the viewer tend generally to take on greater visual importance than elements located lower than the viewer, especially when viewed from nearby (e. g., in the foreground distance zone).

Key observation points (KOPs)**{**tc "Key observation points (KOPs)" \f A \l 1**}** generally represent the most important or sensitive locations from which a proposed project or visual resource would likely be visible. KOPs are used in this analysis to provide examples of representative or typical views from general viewing areas and locations in and around the project area and are not the sole points from which views are analyzed. Data provided by the applicant includes photographs taken of the existing conditions of the project area and site from a variety of locations, including the KOPs identified for this project. The applicant has also provided photosimulations of the proposed project for most of the KOPs.

Criteria for determining the significance of visual impacts are based on the State CEQA Guidelines and specific interpretation of these guidelines by local government agencies. The specific criteria for determining significance of impacts for this project are identified in the "Impacts" section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private and municipal lands and is not subject to federal or state land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, the project is not subject to any federal or state regulations pertaining to visual resources.

LOCAL

The proposed power plant, including all of the linear features (i.e., water lines, natural gas lines, sewer lines, and above-ground power transmission lines), would be located in the City of San Jose and Santa Clara County. Therefore, the project will be subject to local laws, ordinances, regulations, and standards of the City of San Jose and Santa Clara County that pertain to protecting and maintaining visual character and quality and are from the *San Jose 2020 General Plan* (City of San Jose 1994*), San Jose Zoning Ordinance* (City of San Jose 1997), *Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area* (City of San Jose 1985), and *Santa Clara County General Pla*n (Santa Clara County 1994). Applicable local laws, ordinances, regulations, and standards are identified in this chapter in the section entitled "Compliance with Laws, Ordinances, Regulations, and Standards."

SETTING

This section identifies the existing, or baseline, conditions for the visual resources of the surrounding region and the project site and vicinity. The existing visual character and quality of the area and views of the project site and surrounding areas are described using the FHWA visual impact assessment system. Visual quality of views is assessed using the criteria of vividness, intactness, and unity as applicable. Dominance elements of form, line, color, and texture are described where necessary to help further clarify the assessment of landscape character and quality. The character and quality of views is also based on visual resources identified in local plans as scarce or important to protect. For this analysis, these include views of open space, hills, and the rural landscape. Also, viewer sensitivity is described for views of the site and area.

VISUAL CHARACTER OF THE REGION

Describing the visual character of the region provides a context and frame of reference for identifying and assessing the visual quality of the site and its surroundings. The proposed project is located in the southern part of the City of San Jose and adjacent portions of Santa Clara County. The proposed power plant, transmission lines, and gas line would be located in the northern part of Coyote Valley and the water and wastewater lines would be located in the southern Santa Clara Valley in the Edenvale area just north of Coyote Valley.

COYOTE VALLEY

Coyote Valley trends northwest to southeast and is bounded by steep rolling hills and high ridges that frame the generally flat valley. The Silver Creek Hills are to the northeast and the Santa Teresa Hills are to the southwest. The valley is about 2 miles wide and 7 miles long and extends from the City of Morgan Hill in the south to Tulare Hill and the Coyote Narrows in the north. Coyote Creek is the primary perennial stream draining the valley; it runs generally northwest along the northeast side of the valley near the base of the Silver Creek Hills. Fisher Creek, which runs north, drains the southwest portion of the valley and joins Coyote Creek at the Coyote Narrows at the northwest end of the valley near Tulare Hill.

The hills that frame the valley are mostly covered by annual grasslands that remain green throughout the winter and into mid-spring (see Visual Resources Figure 2), and turn golden-yellow in the summer and fall. Grazing of the hills generally maintains the grasses at low heights, creating a smooth appearance to the hills through much of the year. Corridors of trees follow the numerous small drainages descending from the hills and patches of woodlands and chaparral on the hillslopes contrast strongly in color and texture with the grasslands stretched across the rolling topography. The more northerly and easterly slopes of Santa Teresa Hills on the southwest side of the valley tend to support the more dense and larger vegetation and woodlands. During the times of the day and year when the sun is low and shadows are long, the valley can be particularly scenic. The patchwork of variable colors and textures created by the topography, vegetation, shadows, and occasional fog or clouds result in a very scenic natural setting for the valley. Several power transmission lines running across portions of the hills tend to reduce the intactness of views somewhat. However, views of the surrounding hills are generally of moderately high intactness, unity, and vividness.

The valley bottom itself is generally rural in character, consisting largely of agricultural fields and orchards punctuated by scattered rural residences, roads, and small businesses. The largely intact riparian woodland associated with Coyote Creek meanders along the northeast edge of the valley at the base of the Silver Creek Hills. Visually prominent linear elements in the valley include the South Valley Freeway (State Route 101) along its northeastern edge and Monterey Road and the Southern Pacific rail line that parallel each other through its northeastern and central portions. Other notable cultural modifications in the valley include the Metcalf Substation at the north end of the valley; power transmission towers and lines, mostly noticeable at Tulare Hill and near the freeway along the base of the Silver Creek Hills; a golf course; and various buildings scattered or occasionally clustered along Monterey Road, including the rural community of Coyote. Recently built elements in the valley include the IBM facility, consisting of a complex of four- and five-story modern office buildings, and the upgraded portion of Santa Teresa Boulevard between Tulare Hill and Bailey Avenue.

The overall visual character of the valley is of a moderately to highly intact rural agricultural area framed by natural-appearing hills. The City of San Jose (1985) characterizes the North Coyote Valley as providing a spectacular setting with a rural nature, pastoral setting, and agricultural heritage of orchard plantings. In recognition of its value, the City has given the north valley area a special designation of Campus Industrial with the intent of preserving its “present rural aspect” (City of San Jose 1985). The valley area is also considered an important gateway into the San Jose area from the south (City of San Jose 1999a, p 15).

HIGHWAY 101 SCENIC DESIGNATION

The San Jose General Plan (1994) designates Highway 101 through the Coyote Valley as a Landscaped Throughway and Rural Scenic Corridor, designations which recognize the value and sensitivity of the area’s visual quality. For the large numbers of northbound travelers on this major north-south route, this portion of the

highway corridor and the Coyote Valley itself are “the major southern gateway” to San Jose, providing important first impressions of the area (City of San Jose 1999a, p. 15). The Rural Scenic Corridor designation is assigned to roads in rural and open space areas of significant scenic value and carries special policies for protecting the viewsheds of these roads. For corridors with this designation, the City’s General Plan identifies that permitted uses “should be limited to well landscaped campus industrial uses, single family residences, agriculture, parks, trails, and other open space uses in order to preserve the natural scenic resources.” (City of San Jose 1994, p. 191) In addition, the plan indicates that “development along designated Rural Scenic Corridors should preserve significant views of the Valley and mountains, especially in, or adjacent to Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains” (City of San Jose1994, p. 90). Also, the Santa Clara County General Plan (1994) recognizes the aesthetic importance of this area by designating Highway 101 as a scenic highway and identifying the importance of protecting its scenery from “land uses and other activities which would diminish its aesthetic beauty” and “assuring the scenic quality of the corridor.”

EDENVALE

The Edenvale area is located in the southern part of the Santa Clara Valley just northwest of the Coyote Valley and north of Tulare Hill. The area is surrounded by natural appearing hills and the Coyote Creek riparian corridor extends along the northeast edge of the valley near the base of the hills. The flat valley floor contains mostly low-density residential development and neighborhood commercial land uses. Its general character is that of a suburban neighborhood surrounded by scenic hills.

PLANNING CONTEXT

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA

Although the Coyote Valley is currently rural in character, it is intended that the area transition to more intensive land uses in the near future. These changes will undoubtedly alter the appearance of the area. However, recognizing its scenic value and sensitivity and its importance as a gateway to the San Jose area from the south, the City of San Jose has designated a special land use category for the North Coyote Valley that is intended to “allow development that preserves the present rural aspect of the area” (City of San Jose 1985, p. 4). In giving this area the special designation of Campus Industrial, the City has recognized that “the rural nature of the valley, its pastoral setting, and its agricultural heritage of orchard plantings define not only its character, but also the developmental standards needed to preserve that character and benefit from it” (City of San Jose 1985, p. 4).

The North Coyote Valley Campus Industrial Area Master Plan and Guidelines (City of San Jose 1985) provide a detailed description and guidelines for all site planning and design in this area. The master plan calls for the area to be developed as large parcels for single users with minimum building coverage, low intensity use, emphasized landscaping, and uniform high design quality. The stated objectives for

the area are to “protect the land’s inherent character while allowing major companies to consolidate on single, large parcels” (City of San Jose 1985, p. 6).

The master plan was amended in November 1999 to “reinforce the unique, high quality development expected” in the valley (City of San Jose 1999 - November 23, 1999 memo). The amendments only affected certain standards in the Private Development Standards section of the plan, including reducing the minimum size of campuses from 30 acres to 10 acres, increasing the allowable height of buildings from 90 feet to 120 feet, and making other changes to clarify the private development standards for the North Coyote Valley Campus Industrial Area. The Master Development Plan portion of the master plan and guidelines continues to call for parcels to average 50 acres with a minimum of 25 acres, limit building coverage to 30 percent, landscape at least 35 percent of the site, set back buildings from roadways to allow views to surrounding hills, establish a “typically rural pattern of buildings clustered at the center of large sites”, maintain stringent height limits (allowing buildings to have a maximum height of 90 feet) to “lessen disruption of views of the hillsides which form the Valley and establish its character”, and other guidelines to “ensure the preservation of the natural form of the Valley” (City of San Jose 1985, p. 6). The plan states that each parcel must be “designed with the overall form of the valley in mind” (City of San Jose 1985, p. 6). It is anticipated that this area would eventually provide around 50,000 jobs.

The Master Development Plan for the area identifies major features of the plan to include new interchanges with Highway 101; arterial connectors between the highway and the campus industrial area site that cross over Monterey Road and the railroad line; a realigned and restored Fisher Creek corridor with trails, riparian and other native trees, and habitat improvements; and a landscaped parkway that would run adjacent to the creek corridor near the edge or through most of the site. The guidelines for development of the area emphasize the importance of maintaining the area’s rural character by various means including providing natural landscaping along roads and hillsides, orchard-like landscaping in and around parking areas, and tall trees to “punctuate the central building masses.” The stated intent of these design guidelines is to ensure that the architecture and vehicles will be “subordinate to the natural setting” of the Valley (City of San Jose 1985, p 11).

The plan further emphasizes a commitment to developing the area “in concert with” the Valley’s “pastoral beauty” and achieving “visual harmony and continuity” throughout the area. Private improvement guidelines for height limits identify that buildings shall not exceed 120 feet, or 95 feet for Public/Quasi-Public designation, and that for other structures height limits could be established in the context of project review where the height is intrinsic to the structure’s function and significant adverse effects on adjacent properties are avoided (City of San Jose 1999). Also, the guidelines identify that the central building grouping should have the most lush and ornamental planting, creating a “skyline landscape” for each parcel. The master development plan for landscape and open space (City of San Jose 1985, p. 10) shows the majority of the proposed project site as a riparian area.

URBAN RESERVE AREA

The City of San Jose has identified areas of the Coyote Valley south of the industrial campus area and east of Monterey Road as an urban reserve that would be developed largely for residential and supporting commercial and business purposes. Development of this urban reserve area would be triggered by the start of development of the campus industrial area that would generate at least 5,000 new jobs. Development of the high-density urban reserve area would substantially increase the population of the North Coyote Valley and affect its rural character. Because of this, the design guidelines for the campus industrial area play a particularly important role in preserving the rural character of the valley.

DEVELOPMENT PROPOSAL

The City of San Jose is currently reviewing a draft environmental impact report (EIR) for a planned development rezoning for 688 acres of the North Coyote Valley Campus Industrial Area. Cisco Systems intends to begin development of a headquarters complex as part of the proposed Coyote Valley Research Park that would provide up to 20,000 jobs over a 10-year time frame. The development of this area would be required to adhere to the master plan and design guidelines for the campus industrial area and would include development of the major improvements (e.g., freeway interchanges, Fisher Creek restoration, parkway, and infrastructure) required in the plan. Development of this area would trigger the ability to begin development within the urban reserve area and could also lead to the eventual extension of the city's light rail system along Santa Teresa Boulevard.

VIEWER SENSITIVITY

Viewer groups that live, work, or travel in the area are varied. They include residents, workers, travelers, and recreationists. Area residents and people traveling through or recreating in and around the area generally have the highest concern for visual quality and are the most sensitive viewer groups. Recreationists in the area include the high volume of travelers using Highway 101 and Monterey Road; people traveling to and from local parks and recreation areas (e.g., Santa Teresa Park, Motorcycle Park, and Field Sports Park); and bicyclists, hikers, and others using the Coyote Creek County Parkchain. Highway 101 is heavily used by people traveling for pleasure with destinations such as the Monterey Bay area, the San Francisco Bay area, and the Central Coast area. Because of the high volume of recreationists and others traveling for pleasure, viewer sensitivity is generally high in the region. A number of rural residences with high viewer sensitivity are also scattered throughout the Coyote Valley area. Viewer sensitivity in the region is highest for views by residents from within and around their homes, travelers of major roads in the area that carry high volumes of traffic (e.g., Highway 101, Monterey Road, and potentially Santa Teresa Boulevard), and recreationists using trails, parks, and other recreation facilities. Viewer sensitivity is highest for areas within the foreground distance zone (i.e., within ½ mile) of views from these areas.

Viewer sensitivity in the area would likely increase in the near future due to planned development that would increase both the number of residences in the Valley and the number of workers that would have a high concern for visual quality. Viewer

sensitivity for future workers would be high based on the cohesive, highly-unified, high-quality design of the working environment proposed for the North Coyote Valley Campus Industrial Area.

VISUAL CHARACTER OF THE SITE AND SURROUNDINGS

The existing character and quality of visual resources of the project site and vicinity, including areas of linear project features, are described below. Important views from surrounding areas from which the project features may be visible are described. These descriptions provide a basis for identifying changes to the existing visual character and quality of views of the project site and assessing the level of significance of any visual impacts that would be produced by the proposed project. In addition, where appropriate, potential views are described based on development that is planned to occur in the reasonably foreseeable future.

The approximately 20-acre project facility site is located at the northern end of the Coyote Valley at the base and southeast of Tulare Hill. The main part of the site where the power plant would be located is about 16.5 acres. An additional 3-acre strip, about 150 feet wide and 900 feet long, extends south along the southwest side of the rail line. This linear strip would be the main entry and access to the site from Blanchard Road. The facility site is just west of and within 100 feet of the Southern Pacific rail line, 200 feet of Monterey Road, and 2,000 feet of Highway 101.

Fisher Creek runs along the west and north sides of the site at the base of Tulare Hill. Riparian vegetation, including valley oak, willow, and walnut, line the creek channel. An intact woodland containing mature, large (approximately 40- to 45-foot-tall), walnut trees and valley oaks splits the site, extending entirely across the central portion of the site from the creek to the rail line. The trees in this woodland and along Fisher Creek are visible throughout a large area of the northern Coyote Valley. Because of the scarcity of tall trees on the Valley floor, particularly southwest of the rail line, these trees are important visual elements that provide visual interest and variety in the landscape.

The project site is generally flat. The portion of the site south of the trees is an open agricultural field. The area north of the trees consists of grazed grasslands, scattered trees and shrubs, various dilapidated structures and mobile homes, small sheds, animal pens, junked vehicles, and scattered piles of building materials and debris. This northern portion of the site is generally screened from public views by trees and the railroad berm along its eastern edge. A construction laydown area of approximately 12 acres would be sited in the open agricultural field just south of the project site and immediately north of several rural residences.

Located in the vicinity of the project site are a variety of land uses and visual elements that, because of their proximity to the site, provide a context for visual character and quality. Several rural residences are situated south of and within a quarter of a mile of the project site. The Coyote Creek riparian corridor and bike trail run just north and east of Monterey Road within a few hundred feet of the site

(see Visual Resources Figure 3). The riparian corridor contributes substantially to the natural character and vividness of the area.

Just beyond the riparian corridor, a little over a quarter mile east of the project site, is Coyote Ranch, a privately-operated recreation facility that includes an historic ranch house on county park land. This facility and several residences and buildings along Monterey Road southeast of the site contribute substantially to the historic rural character and scenic quality of the area.

The Metcalf Substation, containing an array of metal power poles, is located just beyond the riparian corridor about a quarter of a mile northeast of the site. Because of the high density of industrial elements that contrast substantially in form, line, color, and texture with their surroundings, this facility generally reduces the overall intactness, unity, and vividness of views of which it is a major part. Also, just to the north of the project site on the shoulder of Tulare Hill are several tall metal lattice power transmission towers. A common element found in rural open space lands in the region, these transmission towers reduce the intactness of views of Tulare Hill somewhat, but do not substantially detract from the openness and rural visual character of the surrounding area.

Other surrounding land uses that contribute to the rural visual character and quality of the project area include the small rural roads and agricultural and open space lands in the vicinity. Highway 101 to the east is a major linear element that detracts slightly from the Valley's rural character, but provides high quality views of the area.

VIEWS OF THE PROJECT SITE

The project site is visible from a variety of locations in the area. The viewers, visual sensitivity, and visual quality associated with views of the project site from these locations are identified in Table Vis-1 below and described in detail in Appendix__.

Table Vis-1. Summary of Viewers, Visual Sensitivity, and Visual Quality for Views of the Project Site

KOP No.	Location	Viewers	Visual Sensitivity	Visual Quality
1	Blanchard Road Area	Residents in and around homes, future NCVCIA workers	High	Moderately high
2	Northbound Monterey Road, Railroad, Coyote, and Residences	Travelers on road and trains; residents from in and around homes; customers, employees, and users of commercial and business establishments; future NCVCIA workers	Moderately high to high	Moderate to moderately high
3	Future Overcrossing for Campus Industrial Area	Future NCVCIA workers and visitors	Low currently, high in the future	Moderately high

4	Santa Teresa Boulevard	Travelers on the road	Moderate currently, moderately high in the future	Moderately high
5	Highway 101	Travelers on a scenic highway	High	Moderately low to moderately high
6	Parkway Lakes	Recreationists	Moderately high	Moderate
7	Coyote Ranch and Coyote Creek Trails	Recreationists and residents in and around homes	High	Moderately high
8	Southbound Monterey Road and Railroad	Travelers on road and trains; future NCVCIA workers	Moderately high	Moderately high
9	Basking Ridge Area	Residents in and around homes	Moderately high	Moderate
10	Fisher Creek Corridor	Future recreationists	Low currently, high in the future	Low to high
11	Coyote Valley Urban Reserve	Residents in and around homes	Moderately high	Moderately high to high

IMPACTS AND MITIGATION MEASURES

This section describes the visual elements of the proposed project; identifies the applicant's proposed mitigation measures to reduce the visual impacts of the project; identifies the specific criteria used to evaluate the significance of any identified visual impacts resulting from implementation of the proposed project; describes changes to views of visual resources that would result from implementation of the proposed project; describes the level of significance of any identified impacts; and identifies mitigation measures that would reduce some significant impacts to less-than-significant levels.

PROJECT APPEARANCE

The proposed project consists of a variety of structures and forms that in combination or separately may cause it to be noticeable or visually prominent relative to its surroundings. The main elements of the power plant that would be noticeable and visually prominent include two 145-foot-high heat recovery steam generator (HRSG) stacks; two 95-foot-high HRSG screening structures; an array of steel top works above the screening structures extending up to 122 feet in height and consisting of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents; a 10-cell cooling tower array with screening measuring 64 feet high, 56 feet wide, and 473 feet long; and two 72-foot-high H-frame pole structures with electric lines extending 200 feet to connect to an existing off-site transmission tower. The project includes other structures and

buildings with heights up to 42 feet, entry and access roads, a parking area, a drainage retention area, fencing, landscaping, and a temporary 12-acre construction laydown and staging area. The project also includes underground pipelines for natural gas, recycled water, domestic water, and industrial wastewater and one above-ground gas-metering station.

Other elements of the project that could create visual impacts include night lighting and water vapor plumes from exhaust stacks and cooling towers that would be visible under certain atmospheric conditions. These elements are described below in the assessment of views from various areas and in more detail in separate sections on lighting and water vapor plumes in the section "Project Specific Impacts."

The applicant has identified a variety of key design features for the proposed project that are intended to help it blend with its current and future surroundings. Much of this aesthetic treatment was developed in response to feedback from community members, nearby property owners, local elected officials and their staffs, CEC staff, and other responsible agencies' staff. The applicant has identified that the primary concerns expressed regarding aesthetics of the proposed power plant included the addition of visible exhaust stacks to the area landscape and design compatibility with development that is planned to occur in the near future as part of the Campus Industrial Area. The key aesthetic design features of the proposed project that the applicant has identified to address these concerns are summarized below.

KEY AESTHETIC DESIGN FEATURES

The applicant has developed design treatment for the power plant that is "intended to make the plant consistent with the design qualities of the office structures that are planned to be developed on the adjacent industrial campus lands and make the plant attractive in its own right" (AFC, Supplement C, p. 8.11-22). The applicant has stated that "the key element of the proposed design is the provision of screening to enclose the HRSG units" (AFC, Supplement C, p. 8.11-22).

The HRSG units would be enclosed by aesthetic screening on the east, south, and west sides to a height of 95 feet to help effectively screen views of the main portions of the HRSG units. The southern corners of the screening structures would be curved to give the structure a lighter, less bulky appearance. Screening on the north side would also extend to a height of 95 feet. The screening is intended to simulate the appearance of modern office buildings in order to relate the power plant's design to the buildings proposed for the Campus Industrial Area. The screening would consist of alternating horizontal bands of light gray-taupe metal spandrel panels and tinted medium gray-taupe translucent fiberglass panels or stainless steel mesh to simulate windows. The finishes for the screening materials are intended to reduce reflectivity.

The HRSG stacks and top works would extend above the screening. The stacks, which would include metal catwalk structures, would be textured with a grid pattern and painted medium gray-taupe. The top works would be painted light gray-taupe.

The cooling tower would have a parapet around the top that would partially screen views of the exhaust cones. This and other buildings and structures would use colors, finishes, and materials to match those of the screening described above.

To further help screen the facilities and help blend the power plant with its current and future (i.e., the campus industrial area development) surroundings, the applicant has proposed landscaping around much of the plant's exterior.

A row of black walnut trees would be planted along the west edge of Monterey Road to extend the effect produced by the heritage Keesling walnut trees both south and north of the area. Native oaks, elderberries, and daylilies would be planted in naturalistic patterns between the row of walnut trees and railroad right of way.

An evergreen hedge of large shrubs (i.e., California wax myrtle) would line the west side of the eastern fenced boundary of the project site. This hedge is intended to help screen views of the facility from passing passenger trains.

On the south side of the power plant site and near the southerly buildings, a double row of coast redwoods would be planted along with small trees in orchard-like patterns. The small trees in orchard-like patterns would also extend along the entry road to the facility to just north of Blanchard Road.

The west and north sides of the site would be planted with native riparian plants in naturalistic patterns along the creek corridor. Native riparian plants would consist of trees such as oaks, buckeye, cottonwood, and sycamore and shrubs such as toyon, coffeeberry, blackberry, and elderberry.

Additional elements intended to address aesthetic concerns and help the power plant become compatible with the campus industrial development are identified below in the applicant's proposed mitigation measures.

APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant has identified mitigation measures as part of the proposed project to reduce the visual impacts of the project. These measures are identified below and are considered part of the proposed project for this analysis.

POWER PLANT MITIGATION MEASURES

The applicant has identified the following mitigation measures to be included in the project design to reduce the visual impacts of the proposed power plant.

Site planning and landscape design:

- Placement of the administration building and other smaller structures on the southern edge of the plant site with the intent of creating a transition in scale between the future industrial campus buildings to the south and the plant's taller features.

- Location of the cooling tower on the west side of the site where it would be partially screened by the HRSG screening structures and site landscaping as it matures.
- Placement of the switching station on the north side of the site where the electric bus and take-off structures would be less visible to the public.
- Placement of the screened HRSG units in an area where they would block views from the planned industrial campus to the south of existing transmission towers located at the eastern toe of Tulare Hill.
- Placement of landscaping along the south side of the site to screen the lower portions of the project's facilities and create a visual link with the landscape treatments that will be required on the adjacent industrial campus lands.
- Installation of landscaping along the western edge of Monterey Road that is intended to screen the project's lower portions in views from the road and the northern end of Coyote and improve the appearance of the road corridor.
- Placement of landscaping along the access road and eastern edge of the site that is intended to partially screen views of the project from passenger trains and reinforce the effect of landscape screening along Monterey Road.
- Architectural design:
- Use of wall structures for the HRSG enclosures that will have alternating horizontal bands of surface materials, creating forms and patterns similar in appearance to proposed buildings for the industrial campus area to the south.
- Use of square designs for the HRSG stacks to reduce their industrial character and improve their compatibility with other existing and future structures in the area.
- Application of a network grid on the exterior of the HRSG stacks to create shadowing and texture.
- Minimization of the height of the cooling tower and use of a parapet to partially screen views of the cones.
- Use of flat, neutral colors on structures to create visual interest, blend the power plant with its surroundings, and help relate it to existing and future structures in the surrounding area.

Additional measures:

- Plume abatement of cooling towers.
- Use of non-reflective materials for fences and treatment or painting of fences to blend with the surrounding environment.
- Construction of signs using non-glare materials and paint treatments using colors that are unobtrusive.
- Minimizing lighting by limiting it to areas required for safety, and shielding lighting from public view to the extent possible. Timers and sensors will be used to minimize the time that lights are on.

- Direction and shielding of lighting to reduce light scatter and glare. Highly directional, low-pressure sodium vapor fixtures will be used.
- The applicant has identified the following additional mitigation measures that are recommended to reduce or eliminate power plant impacts identified in this analysis:
- Further color studies to be conducted in consultation with the City of San Jose and the CEC to identify a color scheme for the plant structures that will maximize their visual integration into their landscape backdrop and optimize their relationship to surrounding structures.
- Installation of trees along Coyote Ranch Road in consultation with the manager of Coyote Ranch to reduce the visibility of the project's structures from KOP 7.
- Collaboration with Caltrans to ensure good maintenance and continued growth of the trees planted along the west side of U.S. 101 in the vicinity of KOP 5.
- In the event that a trail is developed in the corridor along Fisher Creek, consultation with San Jose Park Department staff and staff of other relevant agencies to design and install plantings along the east edge of the trail that will screen views toward the plant site.
- In consultation with project site neighbors, the City of San Jose, and the CEC, design and installation of temporary fencing around the laydown area adjacent to the plant to reduce the visibility of construction-period activities.

TRANSMISSION LINE MITIGATION MEASURES

The applicant has identified the following mitigation measures to be included as part of the project design to reduce the visual impacts of the proposed transmission line facilities:

- The transmission structures will be finished with flat, neutral gray tones to help relate them to the colors of the structures in the existing transmission corridor and blend with their surroundings.
- Non-specular conductors and non-reflective and non-refractive insulators will be used to reduce conductor and insulator visibility.

PIPELINE MITIGATION MEASURES

The applicant has identified the following mitigation measure to be included as part of the project design to reduce the visual impacts of the proposed pipelines:

- After construction, ground surfaces will be restored to their original condition, and any vegetation that had been removed during the construction process will be replaced.

SIGNIFICANCE CRITERIA

Criteria for determining the significance of visual impacts are based on the direction from CEQA and the CEQA Guidelines. The CEQA Guidelines define 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.)**{**tc "(Cal. Code Regs., tit.14, § 15382.)" \f C \l 1**}** Appendix G of the CEQA Guidelines, under Aesthetics, lists the following four questions for lead agencies to address:

12. Would the project have a substantial adverse effect on a scenic vista?
13. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
14. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
15. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

In addition, Appendix G of the CEQA Guidelines, under the Land Use and Planning section, poses the question as to whether the project would conflict with any applicable land use plan, policy, or regulation (including, but not limited to a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. Applicable land use plans, policies, and regulations for this project are identified in detail above in the section "Applicable Laws, Ordinances, Regulations, and Standards". Conflicts with such laws, ordinances, regulations, and standards as they relate to visual concerns could constitute significant visual impacts; these conflicts are described below in the section "Compliance with Laws, Ordinances, Regulations, and Standards." Also, CEQA requires the lead agency to address impacts that are individually limited but cumulatively significant.

The City of San Jose has identified that a visual impact would be considered significant if the project would:

- have a substantial, demonstrable negative aesthetic effect; or
- restrict or impair the view within a designated scenic corridor; or
- remove or substantially alter an important scenic or aesthetic resource; or
- substantially block existing views of scenic vistas or resources; or
- produce substantial new light or glare such that it poses a hazard or nuisance (City of San Jose 1999 – letter dated Aug 18).
- Based on the CEQA Guidelines, consideration of the City of San Jose's significance criteria, and the application of professional standards and practices, significant impacts for this project would result from the following:
- conflict with any applicable policies, ordinances, or other regulations for visual resources identified in the general plans, zoning ordinances, or other adopted plans of the local governments with jurisdiction over the project;

- substantial reduction in the visual character or quality of views identified to be of moderate visual quality to high visual quality and moderately high to high visual sensitivity; or
- creation of a new source of substantial light or glare in a location where it didn't exist before and which would adversely affect day or nighttime views with moderately high or high visual sensitivity.

Conflicts with applicable policies, ordinances, or other regulations for visual resources are identified below in the section "Compliance with Laws, Ordinances, Regulations, and Standards."

PROJECT SPECIFIC IMPACTS

CONSTRUCTION IMPACTS

Construction of the project is expected to require up to 20 months. Construction activities, including use of a 12-acre construction laydown and staging area, would be temporary. Immediately following completion of their use, any construction staging areas would be removed and cleaned up. Any construction activities, including use of construction staging areas, that persist longer than one year would be of concern, especially if the visual sensitivity of views of these areas and activities is at least moderately high.

Visual impacts associated with construction of the power plant and use of the construction laydown and staging area would persist for more than one year and are of concern. Any visual impacts of the power plant during its construction are assumed to be similar to the impacts following its construction. Therefore, evaluation of the visual impacts of the power plant during its construction is not discussed further. Visual impacts of the construction laydown and staging area are evaluated below.

IMPACTS OF CONSTRUCTION LAYDOWN AND STAGING AREA

The 12-acre construction laydown and staging area would be located immediately south of the proposed power plant site, west of the railroad tracks and Monterey Road, east of Fisher Creek, and immediately north of residences on Blanchard Road. The laydown area would be visible in foreground views from the Blanchard Road residences and passing passenger trains and partially visible in foreground views for Monterey Road for both northbound and southbound travelers. Also, it would possibly be visible in foreground views from residences on the east side of Monterey Road. It would also be visible in the middleground from Santa Teresa Boulevard. With the possible exception (depending on timing of construction) of the future overcrossing for the campus industrial area, it appears that the laydown area would not be visible from other important viewing areas. Because the future overcrossing is not expected to be built until after the power plant is built and the construction laydown area has been removed, views from this future overcrossing would not be of concern and visual impacts would be less than significant.

Construction activities and use of the laydown area during the construction period would continue for at least 1 ½ years, which is substantially longer than the one-year period of concern identified above for temporary impacts. The laydown area would cover a large portion of the open agricultural field area south of the power plant site and north of the residences on Blanchard Road. The laydown area would be highly visible in foreground views from in and around the residences on Blanchard Road and from passing trains. The laydown area would be used for storage of construction materials, vehicles, and heavy equipment and for parking for workers. It would also contain temporary service buildings. It is assumed that the laydown area would also have lighting for security and safety. All of these elements would introduce new forms, textures, lines, colors, and potentially new light sources to views of the area.

Impacts to Views of the Laydown Area from the Blanchard Road Area

Views of the laydown area from the Blanchard Road area have moderately high visual quality and high visual sensitivity. Visual Resources Figure 4 shows an existing view from this area from KOP 1. The laydown area would cover a large portion of the open field area just past the corner of the wood fence and be highly visible in foreground views from in and around the residences. Use of the area for storage of materials, vehicles, and equipment would introduce new forms, textures, lines, and colors and potentially lighting that would substantially reduce the intactness, unity, vividness, and therefore visual quality of existing views of the open agricultural field and the area from moderately high to moderately low. For these reasons, visual impacts of the laydown area for views from Blanchard Road would be significant.

Impacts to Views of the Laydown Area from Monterey Road, Residences, and the Railroad

Views of the laydown area from Monterey Road and passing passenger trains on the railroad have moderately high visual sensitivity. For residences along the east side of Monterey Road, visual sensitivity is high. Visual Resources Figure 5 shows an existing view from KOP 2 by northbound travelers from Monterey Road. For northbound travelers on Monterey Road, the visual quality is moderate. Southbound travelers on Monterey Road would have more open and somewhat closer views of the laydown area and these views would be moderately high in visual quality. However, views of the laydown area for both northbound and southbound travelers on Monterey Road would be partially screened by the railroad berm with some taller elements within the laydown area likely to be more easily visible.

For southbound travelers on Monterey Road, the existing views are of riparian trees, agricultural buildings, rural homes, and the Santa Teresa Hills in the middleground and background. Views from passing trains would also include open agricultural fields. For southerly views along this portion of Monterey Road and trains traveling just south of the power plant site and the grove of trees on the site, the visual quality is moderately high. The laydown area would cover much of the open field south of the power plant site and be visible in foreground views. Use of the area for storage of materials, vehicles, and equipment would introduce new forms, textures, lines, colors and potentially lighting that would substantially reduce the intactness, unity, and vividness of existing views of this area. For southbound travelers on Monterey

Road, views of the lower portions of elements in the laydown area would be partially screened by the railroad berm. Therefore, visual quality of existing views of the laydown area by southbound travelers on Monterey Road would not be substantially reduced and the visual impact would be less than significant. However, views of the laydown area from southbound passenger trains would not be screened by the railroad berm and would be fully visible. Therefore, visual quality of existing views of the laydown area from southbound passenger trains would be substantially reduced from moderately high to moderately low and the visual impact would be significant.

Visual quality of existing views of the construction laydown area by northbound travelers on Monterey Road and residences would not be substantially reduced because the lower elements of the laydown area would be partially screened by the railroad berm. For these reasons, visual impacts of the laydown area for views from Monterey Road for northbound travelers and residences along the east side of Monterey Road would be less than significant. For northbound passengers on trains, visual quality would be substantially reduced from moderately high to moderately low for the same reasons described above for southbound views from passing trains. For these reasons, visual impacts of the laydown area for views from northbound passenger trains would be significant.

Impacts to Views of the Laydown Area from Santa Teresa Boulevard

Views of the laydown area from Santa Teresa Boulevard have moderately high visual quality and moderate visual sensitivity. Visual Resources Figure 8 shows an existing view from this area from KOP 4. Although the laydown area would be visible in the middleground, it would be fairly low in profile and would not contrast strongly in form with other elements of the view. From this location and distance, it would appear similar in scale, form, and character to the nearby structures along Blanchard Road and would reduce the overall visual quality only slightly. For these reasons, visual impacts of the laydown area for views from Santa Teresa Boulevard would be less than significant.

Mitigation Measures

Recognizing the potential for significant impacts associated with views of the construction laydown area, the applicant has proposed mitigation measures as part of the proposed project. These include:

- collaborating with residents of one home on the north side of Blanchard Road to design and install a fence around the northern and eastern sides of the property for screening construction period activities (AFC, Supplement C, p. 8.11-29);
- planting trees along the west side of Monterey Road and between the road and railroad tracks at the beginning of construction to provide a modest level of screening and visual enhancement in the area immediately along the road (AFC, Supplement C, p. 8.11-31); and
- developing a plan for the laydown and staging area that will rely on placement of structures and fencing to screen the less attractive elements of the temporary facility from views of the road (AFC, Supplement C, p. 8.11-31).

Although these mitigation measures would help reduce significant visual impacts somewhat, further discussion with the applicant will be required to determine additional measures and specific details of those measures that would be necessary to reduce these impacts to less than significant levels. In addition to the applicant's mitigation measures, the following mitigation measures would help lessen the visual impacts of the laydown area and potentially reduce the significant visual impacts to less than significant levels.

- Minimize the overall size of the construction laydown area and locate it as far as possible from the residences to the south and the railroad tracks.
- Design and install high quality, aesthetic fencing or other screening around the exterior of the laydown area for the full length of the south and east sides and any of the eastern portion of the north side that may be visible to travelers on Monterey Road or passenger trains.
- Provide natural appearing, undulating berms along the west side of Monterey Road in addition to the proposed planting.
- Condition of Certification VIS-5 should be implemented to reduce the significant impacts to less than significant levels.

IMPACTS TO VIEWS OF OTHER AREAS DURING CONSTRUCTION

Construction of all elements of the project other than the power plant would require less than 1 year. Therefore, construction activities, including use of construction staging areas other than the construction laydown area described above, would be of short duration. Because visual impacts of short duration construction activities would be less than significant, the visual impacts of construction for these other areas would be less than significant.

PIPELINES

Several routes for below-ground electric, water, and gas lines would be visible from some locations. With the exception of one gas metering station, these routes would not contain any above-ground elements after construction and the construction period for these pipelines would be less than one year. The applicant has identified mitigating any visual impacts of the pipelines by restoring the ground surfaces of the pipeline routes to their original condition after construction and staff has identified the requirement for this in condition of certification VIS-4. Because the construction period for the pipelines would be temporary and short-term (i.e., for less than one year), ground surfaces would be restored immediately following construction as identified in condition of certification VIS-4, and the pipelines contain no visible above-ground elements other than the gas metering station, the visual impacts of these pipelines would be less than significant for conditions both during and after their construction. Also, it is assumed that the construction period for the gas metering station would be less than one year and any visual impacts of the gas metering station during its construction are assumed to be similar to the impacts following its construction, which are discussed below. Therefore evaluation of the visual impacts of the gas metering station during its construction is not discussed further.

OPERATION IMPACTS

IMPACTS TO VIEWS FROM BLANCHARD ROAD AREA

Impacts on Existing Setting

Views of the proposed power plant from the Blanchard Road area have moderately high visual quality and high visual sensitivity. Visual Resources Figure 20 shows the proposed project 5 years after its completion as it would appear from the Blanchard Road area from KOP 1. The facility would appear as several tall and massive structures in the foreground near the base and in front of Tulare Hill. The two tallest structures, consisting of the screened HRSG units and stacks, are designed to have similar characteristics to office buildings with simulated wrap-around window bands in their lower portions. The steel top works, which would be clearly visible above the HRSG screening structures, would indicate an industrial character for the facility. These tall structures would be clearly silhouetted against the sky above the ridgeline of Tulare Hill, drawing attention to the facility and away from its bucolic setting. The cooling tower structure would be a massive rectilinear structure without the appearance of windows and, with the nearby large tanks, would appear industrial in character. However, viewed from this location, these structures would not penetrate the sky above the ridgeline and consequently would be somewhat absorbed into the background hill. Their massive forms, however, would block a large portion of the grass-covered lower slope of Tulare Hill and reduce the intactness of the view.

To viewers from the south, the 95-foot high twin structures would appear massive and bulky relative to the natural forms of their surroundings and the existing much thinner and lighter transmission towers visible along the ridge. These massive structures would dominate their setting and contrast strongly in form, line, and texture with the existing, much lighter transmission towers they would replace in the view. The structures containing the HRSG stacks, cooling towers, and water tank would contrast with each other in form and style and they would contrast substantially with their rural and natural surroundings in form, line, and texture.

The distinctive line of tall, natural-appearing, mature trees would be replaced by the large structures and a line of shorter, evenly spaced trees at their base. Because few large trees are seen on the valley floor (City of San Jose 1985), this existing intact grove is an important visual element that provides visual interest and variety and contributes to the rural character and visual quality of the area and views from the Blanchard Road area. The project's smaller trees that simulate orchards would support the rural character of the area and provide some visual variety and interest. However, the new and much smaller trees would appear far more neat and manicured, thus substantially changing the more natural, rural character of the views of this area. Because of the tall height and bulk of the twin structures, it appears that it would take at least 20 years for the redwood trees to reach a height where they would substantially screen the lower portion of these structures. A portion of the open agricultural field would also be displaced by the facility, reducing the overall sense of openness.

The power plant would introduce new forms, textures, lines, and colors that would substantially reduce the intactness, unity, vividness, and therefore visual quality of existing views from the Blanchard Road area. Existing views of the open agricultural field, trees, grass-covered hill, and transmission towers would be substantially changed in character from rural to industrial. The visual character and quality of foreground views with high visual sensitivity would be substantially reduced from moderately high to moderately low. For these reasons, visual impacts of the proposed power plant would be significant for views from the Blanchard Road area.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would be high. Visual impacts of foreground views of the proposed power plant from this area would be similar to those described above for existing views. Although the visual character of the area to the south is expected to change, views to the north could be expected to continue to be dominated by rural and natural forms and elements. This is reinforced by the Master Development Plan for the area (City of San Jose 1985) that shows the site of the proposed power plant as largely a riparian area. Because the visual character and quality of foreground views with high visual sensitivity would be substantially reduced from moderately high to moderately low, visual impacts of the proposed power plant with future conditions would be significant for views from the Blanchard Road area.

Mitigation Measures

The proposed project would substantially alter the visual character and substantially reduce the quality of views of the site and its surroundings largely because of its mass, scale, height, and character. Because these factors are intrinsic to the function of the proposed project and the design features and mitigation measures proposed by the applicant cannot substantially reduce the visual impacts that would result from these factors, the residual impacts would be significant. No additional mitigation measures are feasible, so the residual visual impacts for views from the Blanchard Road area would be significant and unmitigable.

IMPACTS TO VIEWS FROM NORTHBOUND MONTEREY ROAD, RAILROAD, COYOTE, AND RESIDENCES

Views of the proposed power plant site from northbound Monterey Road, Coyote, and residences along the east side of the road have moderate visual quality. Views from the railroad are of moderately high visual quality. Visual sensitivity is moderately high for views from the road, railroad, and Coyote and high for views from residences along the east side of the road. Visual Resources Figure 21 shows the proposed project 10 years after its completion as it would appear for northbound travelers on Monterey Road from KOP 2. This view is from just south of Blanchard Road and would be similar for views from residences near this area.

The facility would appear as tall and massive structures in the foreground near the base and in front of Tulare Hill. The two tallest structures, consisting of the screened HRSG units and stacks, are designed to have similar characteristics to office buildings with simulated wrap-around window bands in their lower portions. The steel top works, which would be clearly visible above the HRSG screening

structures, would indicate an industrial character for the facility. These tall structures would be clearly silhouetted against the sky above the ridgeline of Tulare Hill, drawing attention to the facility and away from its bucolic setting.

For these views, the cooling tower would be behind the twin HRSG structures and would be largely screened by them. The large tanks and much of the visible portion of the cooling tower would be mostly screened by trees within about 5 to 10 years of plant startup. Viewed from this location, the cooling tower and tanks would not penetrate the sky above the ridgeline, would be visually absorbed into the background hill, and would be generally screened from view by trees within several years of plant startup.

To viewers from Monterey Road, the railroad, Coyote, and residences to the southeast, the 95-foot high twin structures would appear massive and bulky relative to the natural forms of their surroundings and the existing much thinner and lighter transmission towers visible along the ridge and behind the plant. These massive structures would dominate their setting and contrast strongly in form, line, and texture with the existing, much lighter transmission towers in the view. The HRSG structures, including the stacks and top works would contrast substantially with the rural and natural forms, lines, and textures of their surroundings.

The existing mature grove of trees would be replaced by the large structures and shorter, more neatly ordered trees at their base. Although views of the existing trees are distinctive, elements such as the concrete median, light standards, signs, and telephone poles in the roadway corridor in the immediate foreground somewhat reduce the intactness of views from this area and slightly reduce the distinctiveness of views of these trees. The redwoods and smaller trees simulating orchards would somewhat offset the loss of views of these mature trees; however, this effect would not be apparent for at least 10 years and would not be fully realized for about 20 years. Visual Resources Figure 22 is a photosimulation of an earlier version of the project showing the vegetation as it could appear in 20 years as viewed from Monterey Road.

Although the photograph is taken from a location that shows a large expanse of pavement in the near foreground dominating the view, this amount of pavement would probably not be as apparent in views from vehicles. However, elements within the roadway corridor would tend to diminish the overall contrast of the structures with their surroundings. The power plant would introduce new forms, textures, lines, and colors that would somewhat diminish the intactness, vividness, and unity of views from Monterey Road, Coyote, and nearby residences. Consequently, the visual quality would be reduced somewhat from moderate to moderately low.

Existing views of the mature trees and grass-covered hillside would be changed in character from rural to industrial. The visual character and quality of foreground views from northbound Monterey Road, Coyote, and residences with moderately high or high visual sensitivity would be incrementally reduced from moderate to moderately low. For these reasons, visual impacts of the proposed power plant for views from northbound Monterey Road, Coyote, and nearby residences would be

less than significant. However, the visual character and quality of foreground views from northbound passenger trains would be reduced substantially from moderately high to moderately low. Therefore, visual impacts of the proposed power plant for views from northbound passenger trains would be significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would be high. Visual impacts of foreground views of the proposed power plant from this area would be similar to those described above for existing views. Because the visual character and quality of foreground views with high visual sensitivity would be reduced somewhat from moderate to moderately low, visual impacts of the proposed power plant for views from northbound Monterey Road, Coyote, and nearby residences with future conditions would be less than significant. However, visual impacts of the proposed power plant for views from northbound trains would be significant.

Mitigation Measures

Because visual impacts for views from northbound Monterey Road, Coyote, and nearby residences would be less than significant, no additional mitigation is required for these impacts beyond what the applicant has identified as part of the proposed project. However, for views from northbound passenger trains, the proposed project would substantially reduce the visual character and quality of views of the site and its surroundings largely because of its mass, scale, height, and character. Because these factors are intrinsic to the function of the proposed project and the design features and mitigation measures proposed by the applicant cannot substantially reduce the visual impacts that would result from these factors, the residual impacts would be significant. No additional mitigation measures are feasible, so the residual visual impacts for views from northbound passenger trains would be significant and unmitigable.

IMPACTS TO VIEWS FROM FUTURE OVERCROSSING FOR CAMPUS INDUSTRIAL AREA

Presently, the overcrossing entry for the parkway into the Campus Industrial Area does not exist and there are no views from this elevated position at this location. Consequently, visual sensitivity is low and visual impacts of the proposed power plant would not cause visual impacts at this location until the overcrossing is built. However, the overcrossing is a central feature of the planned Campus Industrial development that is intended to be constructed in the foreseeable future. This elevated entry to the development is intended to be the primary and most important gateway to the development, providing visitors, workers, and others with important impressions. Because of this, it is important to analyze the visual impacts of the proposed power plant from this location.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, views northwest toward the proposed power plant from the future overcrossing would have high visual sensitivity and moderately high visual quality. Visual Resources Figure 23 shows the proposed project 10 years after its completion as it would appear in

views northwest from the overcrossing from KOP 3. From this position, the facility would appear as several tall and massive structures in the distant foreground near the eastern shoulder and in front of Tulare Hill. The two tall HRSG structures would be massive and dominant forms that would appear industrial in character. The cooling tower would appear as a massive rectilinear structure. The domed top of the large water tank would be slightly visible farther to the west. The twin HRSG structures would stand above the brow of the hill behind them, drawing attention to the facility and away from its rural setting at the head of the valley. The bulk of the power plant would replace the line of mature trees along the base of the hill.

The massive HRSG structures would dominate their setting and contrast strongly in form, line, and texture with the other elements in their rural and natural surroundings, including the much lighter transmission towers behind them and the complex of rural homes and farming structures to the west. These rural structures are highly visible elements in the view; however, they reinforce the rural character of the area because of their low height, small scale, and distinctive palm trees that are a recognizable feature in rural areas in much of California.

The distinctive line of mature trees and the open field that contribute to the visual interest, variety, openness, and rural character in the view would be replaced by the large structures and mass of planted trees. Over a period of 10 to 20 years, the trees that are to be planted as part of the project would help to somewhat relieve the strong visual contrast of the structures with their surroundings. However, the mass, height, and overall bulk of the project would continue to cause it to appear greatly out of scale with its surroundings.

In the future, once the overcrossing is built, it may be assumed that the campus industrial area would also be developed to some degree. Based on the master plan and guidelines developed for the campus industrial area, it is probable that the power plant would continue to be highly visible from this location. The guidelines call for structures to be developed at the centers of large parcels with generous landscaped setbacks allowing development that is intended to preserve “the present rural aspect of the area.” Based on these guidelines, it is likely that the proposed project would be more in character with the campus industrial area than with its present rural surroundings. However, its height and scale would be larger and its building forms more massive and noticeable than the guidelines currently allow. The proposed project’s position at the head of the valley and the convergence of the railroad tracks and sloping ridge of Tulare Hill and its massive structures penetrating the ridgeline would draw attention to it and make it highly noticeable in panoramic views of the area from the overcrossing.

Guidelines for development of the campus industrial area are currently being updated and are anticipated to be considered for approval by the City Council later this year. These draft guidelines (City of San Jose 2000) clarify improvements to the overcrossing that could help partially screen views of the proposed power plant and direct viewers attention away from the head of the valley and project site from this future gateway entry. Visual Resources Figures 24 and 25 show landscape screening, fencing, light poles, and sculptures intended to be developed at the entry overcrossing that would greatly reduce viewers’ attention toward the project.

Although these draft guidelines have not been adopted, they indicate a strong intention by the City to require improvements as part of development of the campus industrial area that would meet the intent of focusing views from the overcrossing toward the west.

The proposed power plant would introduce new forms, textures, and lines that would substantially reduce the intactness, unity, vividness, and therefore visual quality of future views of this area from the overcrossing. Views of the site and its surroundings would be substantially changed in character from rural to industrial. The visual character and quality of foreground views with high visual sensitivity would be substantially reduced from moderately high to moderately low. However, viewers' attention would be directed away from the power plant and views of the plant would be partially screened by improvements intended as part of the development of the future overcrossing. For these reasons, visual impacts of views of the proposed power plant from the future overcrossing for the Campus Industrial Area would be less than significant.

Mitigation Measures

Although the proposed project would substantially reduce the visual character and quality of views of the site and its surroundings for future views from the overcrossing, future conditions that would permit these views would also effectively mitigate these visual impacts to a less than significant level. Therefore, no mitigation measures beyond those design features identified by the City to be developed as part of the overcrossing's design and what the applicant has identified as part of the proposed project would be required.

IMPACTS TO VIEWS FROM SANTA TERESA BOULEVARD

Views toward the project site from Santa Teresa Boulevard have moderately high visual quality, moderate visual sensitivity, and moderately high future visual sensitivity. Visual Resources Figure 26 shows an earlier version of the proposed project as it would appear to northbound travelers on Santa Teresa Boulevard from KOP 4.

The facility would be visible in the middleground of the view north across the open valley. The HRSG structures and stacks would be noticeable at the eastern toe of Tulare Hill. The vertical forms and banded textures of the twin structures would contrast with the surrounding elements of the open agricultural fields and grass-covered hillsides. The facility's color would blend reasonably well with its surroundings in this middleground view. Although the facility would contrast in character with its rural setting, the surrounding hills and open fields dominate the overall view and the structures would be subordinate to these larger landscape elements.

The proposed project would introduce new forms, textures, lines, and colors that would slightly reduce the intactness, unity, vividness, and therefore visual quality of existing views from Santa Teresa Boulevard. However, the rural character of existing views of the open agricultural fields and grass-covered hills would not be substantially changed by the project because these larger landscape elements tend

to dominate the overall view. For these reasons, the proposed project would not substantially reduce the existing moderately high visual quality of the view from Santa Teresa Boulevard. In addition, the visual sensitivity of existing views toward the proposed project is moderate. Therefore, the visual impacts of the proposed project would be less than significant for the view from Santa Teresa Boulevard.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would be moderately high. Visual impacts of middleground views of the proposed power plant from this area would be similar to those described above for existing views. Because the visual character and quality of middleground views with moderately high visual sensitivity would not be substantially reduced, visual impacts of the proposed power plant would be less than significant for future views from Santa Teresa Boulevard.

Mitigation Measures

Because visual impacts for views from Santa Teresa Boulevard are less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM HIGHWAY 101

Views of the proposed power plant from Highway 101 have moderately high visual quality for northbound views and moderately low to moderate visual quality for southbound views. Visual sensitivity is high for both current and future conditions. Visual Resources Figure 27 shows the proposed project as it would appear for northbound travelers on Highway 101 from KOP 5. The upper portions of the HRSG structures and stacks and a small portion of the cooling tower would be visible in foreground views. Existing berms and vegetation along the highway and in the median area would screen views of the lower portion of the structures at the power plant. Elements that include the highway corridor, trees, and grass-covered Tulare Hill tend to dominate the view from this area. The structures would be positioned well below the ridgeline of the hill and would be subordinate to it and other elements in the view. Because the structures would appear as an industrial facility, they would change the rural character of the view somewhat. They would also add forms and textures that somewhat reduce intactness, vividness, and unity of the rural landscape view from moderately high to moderate. However, because the structures would be partially screened and largely subordinate to the overall view, they would not substantially reduce the overall visual quality of this view with high visual sensitivity. Similarly, for southbound views from the highway, the proposed project would not substantially reduce the existing moderately low to moderate visual quality. For these reasons, visual impacts of the portion of the proposed power plant project located west of Highway 101 would be less than significant.

A gas metering station was recently added as part of the proposed project (Calpine/Bechtel 2000 – AFC Suppl. C). The facility would be located along the east side of and near Highway 101 where it would be potentially visible to high numbers of viewers in foreground views with high viewer sensitivity. In order to

assess the potential visual impacts of this facility, Energy Commission staff has requested additional information from the applicant about the facility's precise location and appearance.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would also be high. Visual impacts of foreground views of the proposed power plant from the highway would be similar to those described above for existing views. Because the visual character and quality of foreground views with high visual sensitivity would not be reduced substantially, visual impacts of the proposed power plant with future conditions would be less than significant for views from Highway 101.

Mitigation Measures

Because visual impacts for views from Highway 101 of the main portion of the proposed power plant west of Highway 101 would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project. However, visual impacts of the gas metering station east of the highway have not been evaluated by staff at this time.

IMPACTS TO VIEWS FROM PARKWAY LAKES

Views of the proposed power plant from the Parkway Lakes recreation area have moderate visual quality. Visual sensitivity is moderately high for both current and future conditions. Visual Resources Figure 28 shows an earlier version of the proposed project as it would appear to viewers from Parkway Lakes from KOP 6. Approximately the upper half of the tall HRSG structures and stacks would be visible in middleground views. The structures would have the appearance of an industrial facility. The tall industrial-like structures would protrude noticeably above the trees in the foreground. By screening the lower portion of the structures, the riparian trees would help absorb their forms and lines. Although noticeable, the structures would be generally subordinate to the larger elements of riparian trees in the overall view. Their form, line, texture, and to a lesser degree color, would reduce the view's intactness and unity somewhat, but would not affect its vividness. Existing power transmission towers in the view are similar in height to the twin structures and also protrude above the riparian trees and horizon line. Although lighter in texture than the power plant structures, the transmission towers would help somewhat to reduce the impact of the power plant in this middleground view. Largely because of its industrial-like character and tall forms protruding above the trees, the proposed project would reduce the visual quality somewhat from moderate to moderately low. Because the structures would be partially screened and largely subordinate to the overall view, they would not substantially reduce the overall visual quality of this view with high visual sensitivity. For these reasons, visual impacts of the proposed project for views from Parkway Lakes would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area may be slightly affected, but would continue to remain moderately high. Visual impacts of middleground views of the proposed power plant from the highway would be similar to those described above for existing views. Because the visual character and quality of middleground views with moderately high visual sensitivity would not be reduced substantially, visual impacts of the proposed power plant with future conditions would be less than significant for views from Parkway Lakes.

Mitigation Measures

Because visual impacts for views from the Parkway Lakes recreation area would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM COYOTE RANCH AND COYOTE CREEK TRAILS

Views of the proposed power plant from Coyote Ranch have moderately high visual quality and high visual sensitivity for both current and future conditions. For this analysis, it is assumed that any views from recreation trails along Coyote Creek would have similar conditions to those for views from Coyote Ranch and any visual impacts would be similar as well. Visual Resources Figure 29 shows the proposed project as it would appear from the ranch grounds from KOP 7. Approximately the upper half of the tall HRSG structures, including the stacks and top works, would be visible in foreground views. However, existing riparian trees in the creek corridor would screen views of the lower portion of the power plant structures and the structures would not penetrate the horizon line of Tulare Hill and therefore would not be easily seen against the sky. The combination of screening of the lower portions of the power plant by the riparian trees and the fact that the power plant would not extend above the horizon line would tend to cause the power plant to be somewhat visually absorbed into the overall view. Also, several transmission towers visible in views of the plant from Coyote Ranch would contribute somewhat to reducing the extent of the plant's contrast with its surroundings.

The power plant would introduce new forms, lines, and textures that would contrast somewhat with the surrounding natural and rural elements in the landscape, reducing the intactness, vividness, and unity of views of the project site from Coyote Ranch incrementally from moderately high to moderate. Also, the presence of the power plant would somewhat reduce the visual character of the existing rural views from the ranch area. Because the proposed power plant would not substantially reduce the existing visual quality and character of the views from the ranch and nearby trails, the visual impacts of the proposed project for this view would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would continue to be high. Visual impacts of foreground views of the proposed power plant from Coyote Ranch would be similar

to those described above for existing views. Because the visual character and quality of foreground views with high visual sensitivity would not be reduced substantially, visual impacts of the proposed power plant with future conditions would be less than significant for views from Coyote Ranch and nearby trails.

Mitigation Measures

The proposed project would not substantially change the visual character or reduce the visual quality of views of the site and its surroundings from Coyote Ranch. However, it would introduce new elements that would somewhat change the visual character and reduce the quality of the existing views from Coyote Ranch. In recognizing the potential for visual impacts and the high visual sensitivity of the views, the applicant has identified potential mitigation to reduce the visual impacts of the proposed project. This mitigation would involve working with the ranch's operator to identify measures that would reduce the project's effects on views, including placing trees along the road between the power plant and viewers to screen views of the project. For this measure to be effective, the trees would have to reach a height of at least 40 feet before they screened the majority of the power plant from view. Growing trees to this height would require a substantial length of time. Although the trees would not have a substantial effect on screening views of the power plant for many years, it would be appropriate for the applicant to proceed with the suggested planting to help reduce visual impacts of the project in the future. Therefore, Condition of Certification VIS-7 should be implemented to help reduce the long-term visual impacts of the proposed project.

IMPACTS TO VIEWS FROM SOUTHBOUND MONTEREY ROAD AND THE RAILROAD

The visual quality of views of the proposed power plant site from southbound Monterey Road and the railroad varies from moderately low to moderately high depending on the viewer's location along the road. Visual sensitivity is moderately high and future visual sensitivity would be high. Visual Resources Figure 30 shows the proposed project as it would appear for southbound travelers on Monterey Road from KOP 8 near the toe of Tulare Hill. The view of the site improves greatly for views of the south portion of the site from Monterey Road just south of the central grove of trees on the site. Views of the northern portion of the site are of moderately low visual quality.

The facility would appear as tall, massive structures in the foreground of views from the road. From the road, the upper portions of the HRSG stacks and the top works would be highly visible and give the structures the appearance of industrial facilities. The tall, industrial-like structures would appear more massive than and protrude noticeably above the surrounding elements in this foreground view. As the viewer progresses south, the structures would become increasingly dominant in the foreground. Other structures at the facility would also become visible in foreground views.

For views from farther north along the road, intactness, unity, and vividness would be reduced somewhat by the introduction of substantially more massive structures than currently exist in the view. Also, the introduction of massive elements with an industrial-like character would substantially change the character of the rural

roadside views to more industrial. For views farther south along the road, the massive industrial-like structures would be further to the periphery of the view cone, but very close in proximity to viewers and their height and bulk would be imposing. Other plant facilities, such as the cooling tower, tanks, switchyard, and various buildings, may be visible from the road and railroad, but would be farther back, lower in height, and therefore less noticeable and less visually imposing. The massive HRSG structures would dominate their setting and contrast strongly in form, line, and texture with the other more rural and natural elements nearby.

The grove of mature trees on the site would be replaced by the large structures and shorter trees that would be planted along the road. The walnuts, oaks, and other initially smaller trees and shrubs that would be planted to mitigate the visual impacts of the power plant would somewhat offset the loss of views of these mature trees and eventually would help screen foreground views of the project. However, this screening effect would not be fully realized for many years, especially considering the slow growth rate of oaks.

The power plant would introduce new forms, textures, lines, and colors that would substantially reduce the intactness, unity, vividness, and visual quality and substantially change the visual character of southbound views from the railroad and views from a portion of southbound Monterey Road both with moderately high visual sensitivity. Visual quality would be reduced from moderately high to moderately low and the visual character would be substantially changed from rural to industrial. Although trees that would be planted along the road would eventually reduce some of these visual impacts somewhat, visual impacts of the proposed power plant would be significant for views from a portion of southbound Monterey Road and the railroad.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would be high. Visual impacts of foreground views of the proposed power plant from this area would be similar to those described above for existing views. Because the visual character and quality of foreground views with high visual sensitivity would be reduced from moderately high to moderately low, visual impacts of the proposed power plant with future conditions would be also be significant for views from southbound Monterey Road and the railroad.

Mitigation Measures

The proposed project would substantially reduce the visual character and quality of views of the site and its surroundings from southbound Monterey Road and the railroad largely because it would introduce new elements that would substantially change the visual character and reduce the visual quality of the views. Recognizing the potential for visual impacts, the applicant has identified potential mitigation to reduce them by planting trees that would screen views of the project from the road and planting shrubs along the eastern boundary of the project to screen some views of the project from the railroad. It is anticipated that the trees would eventually reach a height and density that would be effective for screening views of the

project's facilities from the road. However, during the time required for the vegetation to develop into an effective screen, the visual impacts would be significant. Also, the row of shrubs to be planted along the eastern boundary of the project would provide some screening of the lower portions of the project from the railroad. However; the elevated height of the trains on the railroad berm would elevate the height of the viewers and reduce the effectiveness of the plantings for screening views of most of the power plant's features.

Because the factors contributing to the significant visual impacts are intrinsic to the function of the proposed project, and the design features and mitigation measures proposed by the applicant cannot substantially reduce the visual impacts that would result from these factors, the residual impacts would be significant. No additional mitigation measures are feasible, so the residual visual impacts for views from southbound Monterey Road and southbound passenger trains would be significant and unmitigable.

IMPACTS TO VIEWS FROM BASKING RIDGE AREA

Views of the proposed power plant from the Basking Ridge area have moderate visual quality and moderately high visual sensitivity for both current and future conditions. Visual Resources Figure 14 shows an existing view in the direction of the project from this residential area from KOP 9. The upper portions of the HRSG structures would probably be visible in middleground views. However, given the distance and variety of other elements (e.g., the freeway, riparian corridor, and expansive hills) that would dominate the views from this location, the power plant would be subordinate to the larger elements in the overall view and it would not be very noticeable. The project would not substantially reduce the intactness, vividness, unity, or visual quality of the view from this area and it would not substantially change its visual character. For these reasons, visual impacts of the proposed project would be less than significant for views from the Basking Ridge area.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would continue to remain moderately high. Visual impacts of middleground views of the proposed power plant from this area would be similar to those described above for existing views. Because the visual character and quality of middleground views with moderately high visual sensitivity would not be reduced substantially, visual impacts of the proposed power plant with future conditions would be less than significant for views from the Basking Ridge area.

Mitigation Measures

Because visual impacts for views from the Basking Ridge area would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM FISHER CREEK CORRIDOR

Views of the proposed power plant from the future trail corridor along Fisher Creek have highly variable visual quality that ranges from low to high depending on the viewers' position and orientation. Visual sensitivity for current conditions is low. Visual Resources Figure 15 shows an existing view looking north in the direction of the project from KOP 10 which is along the creek corridor near the southwest corner of the project site. Views of the power plant from this area would be dominated by the massive forms and tall structures of the power plant in the immediate foreground, substantially reducing intactness, vividness, unity, and therefore the visual quality of the existing views. However, because existing visual sensitivity is low, visual impacts on the existing setting would be less than significant.

Future Conditions with Campus Industrial Area

With future conditions with the planned Campus Industrial Area developing as expected, visual sensitivity would be high. Travelers moving along the trail corridor would have intermittent but potentially regular and long-duration views of the power plant. These views would be at close range and would include the HRSG structures, cooling tower, tanks, buildings, switch yard, fences, and other facilities. Extensive planting of the riparian corridor proposed as part of the project would probably reduce the visual impacts of some of these foreground views of the power plant. However, extremely dense plantings in some areas could also reduce open views of the landscape that contribute to the high visual quality of views in the area. Visual Resources Figure 31 shows a visual simulation of the view in the direction of the project from the same location as Visual Resources Figure 15 with a dense hedge of vegetation screening views of the power plant. The dense vegetation is intended as mitigation to reduce the project's visual impacts on future viewers that would use the Fisher Creek trail corridor for recreation. The top of one HRSG stack is barely visible above the hedge near the left of the view. The hedge would screen views of the power plant but would also obstruct views of the surrounding landscape shown in the existing view in Visual Resources Figure 15.

The proposed project would substantially reduce the visual character and quality of some views of the project site and its surroundings from portions of the Fisher Creek trail corridor largely because it would introduce new elements that would substantially change the visual character and reduce the quality of those views. Given the proximity of the power plant to the creek corridor, it would dominate views out from the trail at numerous locations. Where visible, the power plant would be very noticeable and it would substantially reduce the intactness, vividness, unity, and therefore visual quality of the views with high visual sensitivity and high and moderately high quality to moderately low quality. In addition, the power plant would substantially change the rural and natural character of the views of this area to more industrial in character. For these reasons, visual impacts of the proposed project would be significant for future views from the Fisher Creek trail corridor.

Mitigation Measures

Recognizing the potential for significant visual impacts to viewers from the Fisher Creek trail corridor, the applicant has identified potential mitigation to reduce those

impacts by planting dense shrubs to screen views of the project from some locations. Although the shrubs could effectively screen some views of the project, they could also obstruct some open views of the surrounding natural and rural landscape that are of high and moderately high visual quality (e.g., views of the surrounding hills, open agricultural fields, Fisher Creek, and riparian trees). Because of this, visual impacts would remain significant.

Because the factors contributing to the significant visual impacts are intrinsic to the function of the proposed project and the mitigation measure proposed by the applicant would itself substantially reduce visual quality, the residual impacts would be significant. Therefore, the applicant should not implement its proposed mitigation for dense landscape screening along the Fisher Creek corridor. No additional mitigation measures are feasible, so the residual visual impacts for views from the Fisher Creek trail corridor would be significant and unmitigable.

IMPACTS TO VIEWS FROM COYOTE VALLEY URBAN RESERVE

Views of the proposed power plant from the Coyote Valley Urban Reserve have moderately high to high visual quality and moderately high visual sensitivity for both existing and future conditions. Visual Resources Figure 19 shows an existing view from KOP 11 looking in the direction of the project from this future residential and mixed use area south of the proposed project. Views from this area for some existing rural residences located in the reserve area would be similar.

For existing views from this area from in and around existing rural residences, visual sensitivity is moderately high. From the southerly portion of the urban reserve, the facility would be visible in middleground views north across the open valley. The HRSG structures and stacks would be noticeable at the eastern toe of Tulare Hill. However, from this viewing distance, the vertical forms of the twin structures would not contrast strongly with the surrounding hills, trees, and rural structures. The facility's color would blend reasonably well with its surroundings in these middleground views.

Although the facility would be noticeable, the surrounding hills and open fields would dominate the overall view and the structures would be subordinate to these larger landscape elements. The proposed project would introduce new forms and lines in this rural landscape; however, it would not substantially reduce the intactness, unity, vividness, and therefore visual quality of the views and the existing rural character would not be substantially changed. If the planned Campus Industrial Area develops between the urban reserve area and the power plant as expected, the power plant would be even less noticeable in views from existing rural residences for future conditions. For these reasons, the visual impacts of the proposed project would be less than significant for views from the existing rural residences located within the Coyote Valley Urban Reserve.

Future Conditions with Campus Industrial Area

Because the urban reserve area would potentially be developed for residential uses in the foreseeable future, it is necessary to analyze the visual impacts associated with these future conditions. If the planned Campus Industrial Area develops as

expected, future visual sensitivity for views from this area would be moderately high. From the southerly portion of the urban reserve, the facility would be visible in middleground views north across the open valley. The HRSG structures and stacks would be noticeable at the eastern toe of Tulare Hill. However, from this viewing distance, the vertical forms of the twin structures would not contrast strongly with the surrounding hills, trees, and rural structures. The facility's color would blend reasonably well with its surroundings in these middleground views. Although the facility would be noticeable, the surrounding hills and open fields would dominate the overall view and the structures would be subordinate to these larger landscape elements.

Although the proposed project would introduce new forms and lines in this rural landscape, it would not substantially reduce the intactness, unity, vividness, and therefore visual quality of the views and the existing rural character would not be substantially changed. If the planned Campus Industrial Area develops between the urban reserve area and the power plant as expected, the power plant would be even less noticeable for future conditions.

In addition, portions of the urban reserve are also located just south of Coyote Ranch Road and east of Monterey Road where the power plant could be visible in the far foreground and near middleground of potential future views. Visual impacts associated with potential views from future residences in this portion of the urban reserve would be similar to those described above for residences on the east side of Monterey Road.

For the reasons described above, the visual impacts of the proposed project would be less than significant for future views from the Coyote Valley Urban Reserve.

Mitigation Measures

Because visual impacts for views from the Coyote Valley Urban Reserve would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

LIGHTING

Existing lighting levels are generally very low in the vicinity of the proposed power plant. Nearby sources of existing light include currently occupied temporary rural residences (i.e., mobile homes) on the northern portion of the project site, rural residences and farm buildings about 800 feet southeast of the site, and nighttime traffic on Monterey Road just east of the site. Currently, a tall grove of trees on the project site screens views of most of the light from on-site structures from most locations in the area. The surrounding area is mostly agricultural fields and open space with few or no lights. The Fisher Creek riparian corridor is adjacent to the site on the west and north. The City of San Jose has policies to protect riparian areas from excessive light and glare; these are addressed in the section "Compliance with Laws, Ordinances, Regulations, and Standards" below. The project site is visible from and within the foreground view corridor of a portion of Highway 101 which is designated as a Rural Scenic Route by the City of San Jose and a scenic highway by Santa Clara County. Visual sensitivity is high for

foreground views from the highway. The project site is also visible from other locations in the foreground and middleground of views with high or moderately high visual sensitivity.

Many of the structures and facilities at the proposed project would require lighting for operations, safety, and security. Several of the structures would be massive and tall with heights exceeding 50 feet. Exterior lighting for safety, security, and operations for the proposed power plant has the potential to considerably increase light levels, creating glare and backscatter to the nighttime sky. When viewed from several locations with high visual sensitivity, new sources of light produced by the power plant could be visible in an area that currently has very low light levels.

The applicant has not submitted specific information on the lighting plan or lighting levels for the project. However, the applicant has proposed measures to reduce these visual impacts (see "Applicant's Proposed Mitigation Measures") and Energy Commission staff has expanded on these measures in a proposed condition of certification (see below). The applicant's proposed mitigation measures for minimizing visible light from the proposed power plant include restricting lighting to areas required for safety and security; direction of lighting onto the site; shielding lighting; use of non-glare fixtures; use of switches, timers, and sensors to minimize the amount of time that lights are on; enclosure of major project structures; and screening using dense landscape planting. Also, the applicant has stated that the plant will remain in darkness during much of the night and no blinking safety lights would be required by the FAA for safety.

The project has the potential to produce significant adverse visual impacts by introducing new sources of substantial light or glare in a location that currently has very low light levels. Recognizing this potential, the applicant has identified mitigation measures as part of the proposed project that are intended to substantially reduce the off-site visibility of lighting. With implementation of the applicant's mitigation measures and Condition of Certification VIS-3, these potential significant adverse visual impacts would be less than significant.

VISIBLE PLUMES

The proposed project would produce visible water vapor plumes from the cooling tower and HRSG exhaust stacks under certain meteorological conditions. The cooling tower would contain 10 cells and would be 64 feet high and the two HRSG exhaust stacks would be 145 feet high. No existing sources of water vapor plumes are located in the North Coyote Valley area. In recognizing the high visual sensitivity of the area, the applicant has incorporated as part of the plant design for the HRSG stacks "an economizer bypass system that will be used to eliminate a visible water-vapor plume during the rare occurrence of meteorological conditions that may cause visible plumes to occur" (Calpine/Bechtel 1999, p. 11). The applicant has stated that "under almost all circumstances, no visible plumes will be seen emanating from the plant's HRSG stacks" (Calpine/Bechtel 2000, p. 8.11-38). However, the applicant has also stated that on rare occasions during the year when temperatures are very low and humidity is high, water vapor plumes from the HRSG

stacks and cooling tower could form and be visible; these conditions would tend to occur at night and in the early morning hours.

At this time, Energy Commission air quality staff is in the process of analyzing the data for water vapor plumes presented by the applicant and has not verified the accuracy of the applicant's data and analysis of the water vapor plumes for the proposed project. Upon completion of staff's evaluation, the potential visual impacts of water vapor plumes will be analyzed.

CUMULATIVE IMPACTS

The proposed power plant would be located in an area that is currently rural in character. The area is largely open space, consisting mostly of agricultural fields, grazed grasslands, rolling hills, and riparian areas, and includes a few rural homes and structures nearby. At least one major project is proposed to be constructed in the near future in the immediate vicinity of the proposed project site in the North Coyote Valley area. Several other projects would potentially be developed in the reasonably foreseeable future. Some of these projects would be located far enough from the proposed project that the cumulative visual impacts of these projects in combination with those of the proposed project would be minimal.

The Coyote Valley Research Park is proposed to be developed on 688 acres just south and within 0.25 mile of the proposed power plant site. The area would extend from the project site south to Bailey Avenue and from the railroad tracks west to the base of the Santa Teresa Hills. A little over half of this area would be developed with campus industrial facilities, including research and development operations largely for high technology businesses. The remainder would be developed for storm water retention and detention and open space, mostly in the area west of Santa Teresa Boulevard. The campus industrial facilities would contain about 6.6 million square feet of floor space. Cisco Systems intends to develop its headquarters complex within the research park, creating approximately 20,000 jobs.

Lands south and east of the proposed research park are designated by the City as the Coyote Valley Urban Reserve. The City has identified that development of these lands for mixed residential and commercial uses could begin once development that would generate 5,000 jobs has begun for the campus industrial area. The research park would generate enough jobs to trigger the beginning of development of the urban reserve lands. The urban reserve lands are expected to contain up to 25,000 dwelling units and business and commercial uses.

In addition, several projects are proposed in the general vicinity of the proposed project that could have cumulative visual impacts. However, these projects are located far enough from the proposed project that the cumulative visual impacts of the project in combination with those of the proposed project would be minimal. These projects include the Stellex office and manufacturing project, located 4.25 miles north; the Hellyer View manufacturing and research and development facility, located 4.25 miles north; the Hellyer Vista View 1 manufacturing, research and development, and warehousing facility, located 4 miles north; the Creekside Plaza manufacturing, research and development, and warehousing facility, located 4 miles

north; the Lincoln Property Company research and development facility, located 3.25 miles north; the Pepper Lane Properties research and development facility, located 2 miles north; and a 142-acre single-family residential development, located 1 mile north. Each of these proposed developments is located beyond the northern limit of the North Coyote Valley in areas that are generally more developed and less rural in character than the proposed project. Because they are not located within the project's affected visual character zone (i.e., the North Coyote Valley), their visual association with the proposed power plant would not be strong. For this reason, the cumulative effects of the proposed power plant in combination with these proposed projects would be less than significant.

The proposed Coyote Valley Research Park project would include streets, parking lots, and buildings clustered at the centers of large parcels. Based on the guidelines for development of the campus industrial area, the research park project would be developed with building heights, masses, densities, landscaping, and other features that are intended to preserve the rural aesthetic characteristics of the area. However, the proposed Coyote Valley Research Park would substantially change the visual character of the North Coyote Valley from rural agricultural to urban and developed (City of San Jose 2000 – DEIR for Coyote Valley Research Park). In addition, development of the urban reserve area for high density residential, commercial, and other urban development uses would contribute to substantially changing the visual character of the North Coyote Valley from rural to more urban.

As described elsewhere in this section, the proposed power plant project would not entirely conform to the guidelines for development of the campus industrial area. The proposed power plant project would increase the number of structures in the area that would be visible in views from several locations with high visual sensitivity. The power plant structures would be taller and more massive than the design guidelines specify for development of the campus industrial area. Because of this, the power plant would be more noticeable than other structures developed as part of the research park.

For highly sensitive views of both the Coyote Valley Research Park and the Coyote Valley Urban Reserve projects, the effects would be to substantially change the visual character of the area from agricultural and rural to high quality campus industrial and residential. This could substantially reduce the intactness of views of the area, but may not substantially reduce the unity and vividness and therefore visual quality of existing views of the area.

Because the proposed power plant, Coyote Valley Research Park, and Coyote Valley Urban Reserve projects would each substantially change visual character and potentially substantially reduce visual quality for some views, the three projects would potentially produce significant visual impacts and the cumulative visual impacts of the three projects would also be significant. The proposed power plant project would contribute substantially to these significant cumulative visual impacts in the North Coyote Valley.

FACILITY 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 and the transmission lines to reduce visual impacts.

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 and the transmission lines to reduce visual impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section assesses the proposed project's compliance with applicable laws, ordinances, regulations, and standards that affect visual resources. Additional laws, ordinances, regulations, and standards that affect the appearance of new facilities are identified in the Land Use section.

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is not subject to federal or state land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, the project is not subject to any federal or state regulations pertaining to visual resources.

LOCAL

All portions of the proposed project would be variously located in the City of San Jose and Santa Clara County. Therefore, the project will be subject to the applicable laws, ordinances, regulations, and standards relevant to visual resources for those portions of the project within their jurisdictional boundaries. The power

plant would be located on a site that is partially in the City and partially in the County and within the Sphere of Influence of the City. The northern portion of the site is in the County and the southern portion is in the City. Linear facilities also would be located in the City and the County. The northern portion of the proposed 200-foot-long electric transmission line from the plant to an existing transmission tower and portions of proposed water, sewer, and gas lines would be in the County. Also, a gas metering station would be located east of and near Highway 101 in the County. All other elements of the proposed project would be in the City of San Jose. Applicable laws, ordinances, regulations, and standards are identified below and are from the *San Jose 2020 General Plan* (City of San Jose 1994*), San Jose Zoning Ordinance* (City of San Jose 1997), *Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area* (City of San Jose 1985), *and Santa Clara County General Pla*n (Santa Clara County 1994).

CITY OF SAN JOSE

SAN JOSE 2020 GENERAL PLAN

The project's compliance with the policies contained in the San Jose 2020 General Plan (City of San Jose 1994) that apply to protecting and maintaining visual resources is described below. Relevant policies are from the Community Development/Urban Design Element; Aesthetic, Cultural, and Recreational Resources/Scenic Routes Element; and the Land Use/Transportation Diagram, Scenic Routes and Trails Diagram, Scenic Routes.

Community Development/Urban Design

11. Non-Residential building height should not exceed 45 feet except:

In the North Coyote Valley and South Edenvale Areas designated for Campus Industrial Use, the maximum building height is 120 feet (p. 57).

For public or quasi-public uses on properties in any area of the community with a Public/Quasi-Public designation, the maximum building height is 95 feet (p. 57).

For structures, other than buildings, where substantial height is intrinsic to the function of the structures and where such structures are located to avoid significant adverse effects on adjacent properties, height limits may be established in the context of project review (p. 58).

The applicant has submitted an application to the City for annexation of the northern portion of the project site and rezoning the entire site as Public/Quasi-Public. Because the City would require that the site be zoned as Public/Quasi-Public, the City's general plan requirements for this zone are applicable. In addition, the project site is located within the area designated for development of the North Coyote Valley Campus Industrial Area (City of San Jose 1985). The City has clarified that the standards and guidelines identified within the master development plan for this area are "applicable for any and all development in North Coyote Valley regardless of the General Plan designation" (City of San Jose 2000, p. 6). The City has further stated that the master development plan is "intended to guide the

development of a world-class research/technology park in keeping with the City's longstanding economic development goals" and this plan "goes beyond development standards to articulate the character of this planned, high-quality, campus industrial area" (City of San Jose 2000, p. 6). Therefore, it is appropriate to consider that the standards of both the Public/Quasi-Public designation and the North Coyote Valley Campus Industrial Area are applicable for this proposed project.

The two most prominent elements of the project (i.e., the two HRSG stacks) would be 145 feet high, substantially exceeding the existing height limits identified for both the Public/Quasi-Public and the Campus Industrial Area designations (i.e., 95 feet and 120 feet respectively). Other elements of the proposed power plant that would exceed the established height limit for the Public/Quasi-Public designation include the steel top works which consist of an array of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents. These steel top works extend above the 95-foot-high HRSG screening structures to a height of 122 feet. The applicant has stated that the screened HRSG units and other elements of the power plant have been limited to a maximum of 95 feet in order to adhere to the height limit for the Public/Quasi-Public designation.

Although the HRSG stacks and top works would be intrinsic to the function of the power plant, the analysis of visual impacts of the proposed project indicates that the power plant has the potential for significant adverse effects on adjacent properties. Because of this, it appears that the height limits identified above would apply to the proposed project. For these reasons, it appears that the proposed project would conflict with the City's policies for established height limits.

17. Development adjacent to creekside areas should incorporate compatible design and landscaping including plant species, which are native to the area or are compatible with native species (p. 60).

Based on the preliminary landscape plan for the proposed project, dated February 24, 2000, the proposed project would comply with this policy.

24. New development projects should include the preservation of ordinance-sized and other significant trees. Any adverse effect on the health and longevity of such trees should be avoided through appropriate design measures and construction practices. When tree preservation is not feasible, the project should include appropriate tree replacement (p. 60).

Based on the configuration of the elements of the proposed power plant as it has been designed, it would not be feasible to retain the ordinance-sized and other significant trees that comprise the central grove of walnut and valley oak trees on the site. The applicant has stated that it will not be feasible to retain all of the trees now growing on the project site and has proposed a planting plan that shows extensive tree planting to compensate for the loss of trees. For these reasons, the proposed project would not conflict with this policy for preserving ordinance-sized and other significant trees.

Aesthetic, Cultural, and Recreational Resources/Scenic Routes

4. Any development occurring adjacent to Landscaped Throughways should incorporate interesting and attractive design qualities and promote a high standard of architectural excellence (p. 90).

The proposed project is approximately 2,400 feet from Highway 101, which is designated as a Landscaped Throughway. Because of its distance, the project would not be considered adjacent to the highway. For this reason, this policy does not apply to the proposed project.

6. Development along designated Rural Scenic corridors should preserve significant views of the Valley and mountains, especially in, or adjacent to, Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains (p. 90).

The proposed project is approximately 2,400 feet from Highway 101, which is designated as a Rural Scenic route. Although the proposed project is not adjacent to the highway, it is within the foreground distance zone of the highway and easily visible from it. For this reason, the project would be within the scenic corridor of the highway. Based on the visual analysis in this section, the proposed project would not substantially reduce the overall visual quality of views from the highway. For this reason, the proposed project would comply with this policy.

Trails and Pathways

1. The City should control land development along designated Trails and Pathway Corridors in order to provide sufficient trail right-of-way and ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the corridor (p. 91).

The discussion above in the section “Project Specific Impacts“ identifies that the proposed project would produce significant and unmitigable impacts for views from Fisher Creek. Based on this conclusion, the proposed project would detract from the scenic and aesthetic qualities of the corridor and therefore it would not comply with this policy.

Riparian Corridors and Upland Wetlands Policies

4. New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise and toxic substances into the riparian zone (p. 95).

The discussion above in the section on Lighting in “Project Specific Impacts “ identifies that the proposed project has the potential to produce significant adverse visual impacts by introducing new sources of substantial light or glare in a location that currently has very low light levels and that, with implementation of the applicant’s proposed mitigation measures and Condition of Certification VIS-3, these potential significant adverse visual impacts would be less than significant. Based on this conclusion, the proposed project would comply with this policy.

Land Use/Transportation Diagram, Scenic Routes and Trails Diagram, Scenic Routes

Permitted land uses in Rural Scenic Corridors should be limited to well landscaped campus industrial uses, single-family residences, agriculture, parks, trails, and other open space uses in order to preserve the natural scenic resources.

The proposed project is within the foreground distance zone of Highway 101 and easily visible from it. For this reason, the project would be within the scenic corridor of the highway. Although the proposed project does not substantially reduce the visual quality of views from Highway 101, it also does not adhere to the guidelines for aesthetics and visual character for development within the Campus Industrial Area as described below. The proposed project has the appearance of an industrial facility which does not adhere to the types or visual character of land uses permitted or desirable within Rural Scenic Corridors. Because the proposed project does not fit the description of a campus industrial use or the other permitted land uses, it would not comply with this policy.

MASTER DEVELOPMENT PLAN AND GUIDELINES FOR THE NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA

The proposed project lies within the area designated by the City of San Jose as the North Coyote Valley Campus Industrial Area. The plan and guidelines state that "The Guidelines set forth the desired overall perceptual quality of the Development Plan and its elements. They provide written and graphic indications as to size, form, scale and basic organization of the individual private parcels and public open space in a hierarchy of purpose and unity" (City of San Jose 1985, p. 20). The City of San Jose amended the master plan and guidelines in November 1999 to change some private improvement guidelines for campus size, building height, setbacks, parking, and other items. The City intends to make additional comprehensive changes to the master plan and guidelines and seek City Council approval for this comprehensive update in the spring of 2000 (City of San Jose 1999).

Numerous guidelines contained within the current master plan provide direction for developing and maintaining a high level of aesthetic quality and preserving the "present rural aspect of the area." The proposed comprehensive update is intended to further reinforce and clarify standards for unique and high quality campus development in North Coyote Valley that gives the valley a "unique identity" and "preserves much of the natural features of the area" (City of San Jose 2000). The following guidelines contained within the current plan (City of San Jose 1985) are representative of guidelines applicable to visual resources.

Public Improvement Guidelines

Improvements and Jurisdiction

Trees will be preserved whenever possible both on and in areas adjacent to the Campus Industrial Area (p. 26).

The applicant has stated that it will not be feasible to retain all of the trees now growing on the project site and has proposed a planting plan that shows extensive tree planting to compensate for the loss of trees. Based on the configuration of the elements of the proposed power plant as it has been designed, it would not be possible to retain the significant trees that comprise the central grove of walnut and valley oak trees on the site. For these reasons, the proposed project would not conflict with this policy for preserving trees whenever possible on and in areas adjacent to the Campus Industrial Area.

From the Urban Service Boundary to Tulare Hill:

Plant 50-foot landscape area with groupings and groves of tall broadleaf evergreen trees, walnuts, native shrubs and groundcovers (p. 30).

The project would border public improvement areas along Fisher Creek on the west and north. Based on the preliminary landscape plan, dated February 24, 2000, the proposed project would comply with this policy.

Allow view “windows” to hills beyond (p. 30).

The plan and guidelines do not clearly define what is meant by “view ‘windows’”. Because the proposed project would not fully block views of surrounding hills from most areas around the site, it appears that the project would comply with this policy.

Landscape and Open Space

The Landscape and Open Space diagram (p. 35) identifies the majority of the northern portion of the project site as riparian/parkway and indicates that uses should include retention/recreation.

The proposed project would establish uses other than riparian/parkway and retention/recreation on the majority of the northern portion of the project site. Because of this, the visual character and quality generally associated with these land uses would not be established on the majority of the northern portion of the site as shown on the diagram. For this reason, the proposed project would not comply with the intent of the Landscape and Open Space diagram for this area to have the visual character and quality of riparian/parkway open space. Therefore, the proposed project would not comply with this guideline in the plan.

Private Improvement Guidelines

Retain, as much as possible, the views from roadways and developed areas to the hills that form the Valley. The preservation of such views is a major contribution to maintaining the rural character of the area (p. 58).

Because the proposed project would not substantially block views of surrounding hills from roadways and developed areas, it would comply with this policy.

Rural Building Massing Concept: Buildings will be set back from roadways far enough to permit views to the surrounding hills and to establish a rural pattern of buildings clustered at the centers of large sites (p. 59).

The structures of the proposed project appear to be setback from roadways far enough to permit views of the surrounding hills and they are primarily located in the central portion of the site. However, the heights and masses of the structures appear to exceed those described and diagramed in the guidelines identified for the Campus Industrial Area. For these reasons, the proposed project does not appear to establish the rural pattern of buildings described and illustrated in the plan for the area. Therefore, the proposed project would not comply with this guideline in the plan.

Building Edge: Vary the setback of buildings to increase visual interest. Break up building mass to allow views between buildings to surrounding landforms (p. 61).

The structures of the proposed project are set back varying distances from roadways and site boundaries. The structures appear massive and bulky in most views; however, the building masses are broken up enough to permit views of the surrounding landforms. Therefore, the proposed project would comply with this guideline in the plan.

Building Silhouette: Vary the building cluster silhouette and centralize the highest buildings to reinforce the concept of rural building massing (p. 62).

The structures of the proposed project appear to be clustered with the highest structures positioned in the central portion of the site. However, the heights and masses of the structures appear to exceed those described and diagramed in the guidelines for the Campus Industrial Area. For these reasons, the proposed project does not appear to reinforce the concept of rural building massing described and illustrated in the plan for the area. Therefore, the proposed project would not comply with this guideline in the plan.

Building Height: Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan (City of San Jose 1985, p. 62).

The two most prominent elements of the project (the two HRSG stacks) substantially exceed the existing height limits identified for both the Public/Quasi-Public and the Campus Industrial Area designations. These two elements would be 145 feet high. Other elements of the proposed power plant that would exceed the established height limit for the Public/Quasi-Public designation include the steel top works which consist of an array of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents. These steel top works extend above the 95-foot-high HRSG screening structures to a height of 122 feet. The applicant has stated that the screened HRSG units and other elements of the power plant have been limited to a maximum of 95 feet in order to adhere to the height limit for the Public/Quasi-Public designation.

Although the HRSG stacks and top works would be intrinsic to the function of the power plant, the analysis of visual impacts of the proposed project indicates that the power plant has the potential for significant adverse effects on adjacent properties. Because of this, it appears that the height limits identified above would apply to the proposed project. For these reasons, it appears that the proposed project would conflict with the City's policies for established height limits.

Rooftop Equipment: Rooftop mechanical equipment should be consolidated within parapet walls which exceed the height of the equipment. Equipment enclosures should be integrated into the architectural design treatment of the building. Rooftop equipment should be hidden from view from hillsides and elevated entry roads into the valley (p. 63).

The steel top works on the HRSG structures consist of an array of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents. These top works have the appearance of and would be considered to be rooftop equipment. The top works extend above the 95-foot-high HRSG screening structures to a height of 122 feet and would be visible from a variety of locations, including hillsides and entry roads into the valley. The top works are not consolidated within parapet walls and are not screened from view. For these reasons, the project would not comply with this policy.

Flood Control Channel Edge: Development areas will be separated from the riparian landscape of the flood control channel by a 50 foot landscape easement. Native plant materials must be used to extend the landscape within this zone. Security fences will be screened by landscape within this easement (p. 67).

Because the proposed project includes additional plantings of native riparian trees within the 100-foot setback area between Fisher Creek and the security fence around the west and north edges of the facility, it would comply with this policy.

Adjacent Properties Edge: Adjacent properties will be separated by 15 feet of landscaping. Planting within these setbacks will be used to screen security fences (p. 68).

The proposed project includes landscaping that is greater than 15 feet in width along most of the south side of the project. However, the landscaping strip shown on the preliminary landscape plan dated February 24, 2000 does not appear to fully extend along the edge of the property at the drainage detention basin. The security fence is located south of the landscape strip and is not screened from the adjacent property by the planting. Also, the road located south of the fence is not screened from the adjacent property to the south. For these reasons, the proposed project does not comply with this policy.

Monterey Highway: A 50 foot landscape easement will separate properties from the Southern Pacific right-of-way. Hedges will be used to separate buildings and railroad traffic. Security fences will occur on property lines. Building facades facing Monterey Highway should receive consistent architectural treatment. Service and storage areas must be totally screened from view at the time of construction (p. 69).

The proposed project does not include a 50-foot landscape easement separating it from the Southern Pacific right-of-way. The preliminary landscape plan dated February 24, 2000 shows a hedge along the east edge of the property and a security fence located on the property line. However, two small buildings are shown adjacent to the property line and security fence without a hedge separating them from the right-of-way. For these reasons, the proposed project does not comply with this policy.

Major Entry Landscape: Major entrances to properties will be visually marked using tall trees. Typical street planting within the front landscape setback should be visually integrated with the landmark entrance landscape (p. 70).

The preliminary landscape plan dated February 24, 2000 does not show tall trees visually marking the entry to the proposed project. Instead, the plan shows orchard trees extending south along the entry road from the power plant and ending about 100 feet north of Blanchard Road. For these reasons, the proposed project does not comply with this policy.

Parking Lot Illumination: Maintain a uniform distribution of light throughout parking areas. Low-sodium fixtures must be used and maximum parking lot illumination shall not exceed .5 fc. Light sources should not be visible from streets. Luminaire height should be uniform over the parking area and should not exceed 15-20 feet. Fixtures should be visually compatible with the landscape treatment of the parking area. Pedestrian pathways should be illuminated separately to a maximum of .8 fc. Exterior flood lighting of buildings is prohibited (p. 72).

The applicant has not submitted specific information on the lighting plan or lighting levels for the project. However, the applicant has proposed measures to reduce these visual impacts (see "Applicant's Proposed Mitigation Measures") and Energy Commission staff has expanded on these measures in a proposed condition of certification (see below). With implementation of the applicant’s mitigation measures and Condition of Certification VIS-3, the proposed project would comply with this policy.

Building Landscape: The concept of rural building massing will be reinforced with tall and columnar trees to create a skyline landscape which will visually contrast with the surrounding orchard parking landscape. The central building grouping should be the most lush and ornamental planting area of each parcel (p. 73).

Based on the preliminary landscape plan for the proposed project, dated February 24, 2000, the primary tall trees would be coast redwoods that would be located in a double row near the south edge of the site. Although coast redwoods may be suitable for this area, they are not one of the trees specifically identified in the plant lists of appropriate plants for use within the campus industrial area. The row of trees would not be positioned near the central building grouping. This row of trees is intended to form a tall screen that would eventually help to block views of the lower portions of the tallest structures of the project from the south. Figure Vis-22 shows the appearance of an earlier version of the proposed project with the

intended landscape treatment after 20 years. Figure Vis-20 shows the appearance of the proposed project viewed from the south after 5 years. Figure Vis-32 from the plan and guidelines illustrates the concept described for creating a skyline landscape with lush and ornamental planting near the central building grouping. Based on the description and diagrams in the plan, the proposed landscape plan for the project would not achieve the intent of this guideline to reinforce the rural building massing. For these reasons, the proposed project would not comply with this guideline.

General Development Plan Standards

11. All truck loading docks, storage and service areas shall be screened from public view, and shall be located a minimum of 75 feet from any property line. In no case shall such docks, storage or service area be visible from any public street or from Fisher Creek (p. 86).

The site plan for the proposed project does not show truck loading docks, storage, or service areas located within public view, within view of any public street or Fisher Creek, or within 75 feet of any property line. For these reasons, the proposed project would comply with this guideline.

RIPARIAN CORRIDOR POLICY STUDY

The following policies and guidelines are from the City's Riparian Corridor Policy Study (1994) and are intended to preserve and enhance the visual character and quality of the corridors of the City's major waterways. The project's compliance with these policies and guidelines is described below.

Chapter 1: Riparian Corridor Policies and Related Programs

Relationship to Horizon 2000 General Plan

Trails and Pathways

1. The City should control land development along designated Trails and Pathway Corridors in order to provide sufficient trail right-of-way and ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the corridor (p. 7).

Compliance with this policy is described above under Trails and Pathways in the San Jose 2020 General Plan.

Chapter 3: Riparian Corridor Development Guidelines

Site Design

Guideline 1A: Orientation

Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges (p. 30).

For the proposed project, site activities such as entrances, loading and delivery areas, and activities requiring night lighting appear to be oriented away from the riparian corridor and toward non-riparian property edges. For this reason, the proposed project would comply with this policy.

2. Building and Fixture Design

Guideline 2A: Building Appearance

In riparian forest settings located in more rural or suburban areas of the city, building facades should blend visually with the surrounding natural landscape. The colors of buildings should generally be of darker earth tones (e.g., brown, tan, gray, or greens); the use of bright colors and glossy finishes are discouraged (p. 41).

For the proposed project, the buildings would be massive and would appear out of scale with their surroundings. The building facades near the riparian corridor, notably the cooling tower, would present a tall, long, and massive wall to future viewers that would use the intended trails along the creek corridor. The applicant has stated that some views would be at least partially screened and colors and materials for structures near or visible from the riparian corridor would be consistent with the intent of this policy. However, for intermittent but long duration views by future recreationists who would use the riparian corridor and others who would have views of the riparian corridor and the power plant from other nearby locations, the tall and massive building facades would not appear to blend visually with the surrounding natural landscape. For this reason, the proposed project would not comply with this policy.

Guideline 2B: Glare

Building materials should not produce glare that would adversely impact the riparian corridor. Windows should not be mirrored but otherwise their use is not limited (p. 41).

For the proposed project, none of the buildings facing the riparian corridor would have window glass or have finishes that would produce glare. For this reason, the proposed project would comply with this policy.

Guideline 2C: Visual

The adverse visual impact of existing or unavoidable incompatible uses such as parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses should be minimized by landscaping, hedging, berming, low walls, and site design. Rooftop equipment should be screened from view from any riparian corridor trail or recreational, educational, or interpretive facilities within the riparian corridor (p. 41).

For the proposed project, parking areas, loading zones, and trash enclosures would not be located where they would be easily seen from the riparian corridor or they would be screened from view by dense vegetation. Some structures and accessory uses, including the retention basin, switching station, and cooling towers may be visible from some locations within the riparian corridor. Also, the top works on the HRSG structures, which would be considered to be rooftop equipment, may be visible from some locations within the riparian corridor. Although the applicant has stated that views of these elements from the riparian corridor would be effectively screened, it is not clear that all views of these elements from within the riparian corridor would be screened or that it would be desirable to provide this level of screening throughout the corridor. For these reasons, the project has the potential to not comply with this policy.

Guideline 2D: Signs

Signs associated with land uses that are adjacent to the riparian corridor and that are not related to complementary recreational or public safety services should be oriented away from the riparian corridor to avoid impacting recreational users of the corridor, or attracting otherwise unnecessary access and activity (p. 42).

For the proposed project, no signs, other than those necessary for safety and security, would be placed in proximity to the riparian corridor where they would be easily visible. For this reason, the proposed project would comply with this policy.

Guideline 2E: Lighting

All trail corridors, except for the Guadalupe River Downtown, are closed after sunset, and as such do not have lighting (except for security lighting at bridge under-crossings). For all other developments, lighting within the corridor and setback areas should be avoided. Lighting on development sites should be designed and sited to avoid light and glare impacts to wildlife within the riparian corridor, consistent with public safety considerations. Any lighting located adjacent to riparian areas should be as low as feasible in height (bollard lighting is preferred) and must be directed downward with light sources not visible from riparian areas (p. 42).

For the proposed project, no lighting would be located in the riparian corridor. Lighting proposed as part of the project, primarily for safety and security, may be visible from within the corridor. Because of this, the project has the potential to conflict with this policy. However, the applicant has stated that lighting impacts would be minimized through screening, shielding, and the use of timers, sensors,

non-glare fixtures, directional lighting, and similar techniques for minimizing impacts of lighting. With implementation of the applicant's mitigation and Condition of Certification VIS-3, the proposed project would comply with this policy.

Parking lot lighting near a riparian edge (e.g., with minimum setbacks from the corridor) should be avoided if nighttime use of that portion of the parking lot is unlikely (p. 42).

No parking lot lighting would be located near the riparian corridor. For this reason, the proposed project would comply with this policy.

Landscaping

Guideline 3A: Development Landscaping

Landscaping of areas adjacent to the riparian corridor should generally utilize plant species native to central California and appropriate to the riparian habitat type of the corridor. In some areas, remnant riparian species (e.g., remnant sycamore, and valley oak trees) exist outside the mapped riparian corridor. These species should be retained in the development plan. Non-native species may not be planted within the riparian corridor, and invasive exotics should not be used in landscaping within 100 feet of a riparian corridor. Refer to Appendix B for lists of plant species suitable and unsuitable for revegetation within riparian corridors and in riparian setback areas. Refer also to any applicable master landscape plans for landscape requirements (p. 42).

The proposed project identifies planting consistent with this policy. For this reason, the proposed project would comply with this policy.

Guideline 3B: Irrigation

Irrigation systems within 100 feet of riparian areas should be designed to avoid negative impacts to riparian environment conditions (p. 42).

The proposed project identifies that the use of irrigation would be consistent with this policy. For this reason, the proposed project would comply with this policy.

SAN JOSE ZONING ORDINANCE

The applicability of the San Jose zoning ordinance to the project is in the Land Use section of this Preliminary Staff Assessment.

SANTA CLARA COUNTY

SANTA CLARA COUNTY GENERAL PLAN

Portions of the proposed project, including linear elements and the northern portion of the power plant site, would be located on lands under the jurisdiction of Santa Clara County. The project's compliance with policies of the Santa Clara County General Plan (1994) that pertain to visual resources is described below. Policies are for rural unincorporated areas (R) in the categories of land use (LU) and resource

conservation (RC) and countywide issues and policies (C) in the categories of parks and recreation (PR) and growth and development (GD).

R-LU 73

The County's major gas and electric distribution system should be … compatible with the environmental resources and scenic qualities of the County.

R-LU 74

In locating major gas and electric transmission distribution facilities, the primary environmental considerations shall be to minimize aesthetic impacts and to avoid developed residential and/or public recreation areas. Major electric transmission lines should be located and designed in accordance with the following principles:

- Route selection should avoid ridgelines and follow the natural flow and rhythm of landforms as much as possible.
- Routes should not cross scenic roads at points where lines will be visible for long distances.
- Minimum height structures should be used to reduce visual impacts where the additional structures which result are not objectionable.
- Vegetation should be used for screening where it will not interfere with a facility's operation.
- Design, appearance, and paint selection should reduce visual impact.

The proposed gas lines are underground and with implementation of Condition of Certification VIS-4, their visual impacts would be less than significant. The proposed transmission line would run approximately 200 feet north from the proposed project across the riparian corridor of Fisher Creek and connect to an existing transmission tower. Only the lines would be placed and no new structures would be constructed. Although the lines would be noticeable from Monterey Road and the riparian corridor, their visual impacts would be minimal. For these reasons, the proposed gas lines and transmission line would comply with the above policies.

R-LU 75

Electric substations and gas control metering stations shall be located, designed, and landscaped to fit as inconspicuously and harmoniously as possible into the area in which they are required. Locations along scenic roads and heavily traveled highways should be avoided.

A gas metering station was recently added as part of the proposed project. The facility would be located along the east side of and near Highway 101 which is both a designated scenic road and heavily traveled. In order to assess whether this facility would comply with this policy, Energy Commission staff has requested

additional information from the applicant about the facility's precise location and appearance.

R-RC 97

Scenic qualities of the rural areas of Santa Clara County shall be maintained and enhanced through existing land use and development policies. Development compatible with scenic resource conservation should be encouraged.

C-PR 37

The natural scenery along many of Santa Clara County's highways should be protected from land uses and other activities which would diminish its aesthetic beauty.

C-PR 38

Land use should be controlled along scenic roads so as to relate to the location and functions of these roads and should be subject to design review and conditions to assure the scenic quality of the corridor.

C-PR 39

The visual integrity of the scenic gateways to the South County (…. Coyote greenbelt area north of Morgan Hill) should be protected.

C-GD 17

Planning for Coyote Valley's future development should provide for: c. protection of a scenic corridor along Highway 101.

Highway 101 is designated as a county scenic highway. This portion of the highway is also recognized as an important gateway into the county from the south. The rural character and scenic importance of the Coyote Valley are recognized by both the county and city. The proposed project is within the foreground distance zone of the highway and easily visible from it. For this reason, the project would be within the scenic corridor of the highway. Based on the visual analysis in this section, the proposed project would not substantially reduce the overall visual quality of views from the highway. For this reason, the proposed project would comply with the county policies identified above.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project as proposed has the potential to cause significant adverse visual impacts due to the adverse effects of a substantial change to visual character and

substantially reduced visual quality for views with moderate to high visual quality and moderately high to high visual sensitivity.

Effective implementation of the applicant's proposed mitigation measures, as modified and expanded by staff's recommendations, is expected to reduce visual impacts to less than significant levels for some views. However, impacts would remain significant and unmitigable for views from the Blanchard Road area, northbound passenger trains, southbound Monterey Road and the railroad, and the future trail corridor at Fisher Creek. In addition, the proposed power plant project would contribute substantially to producing significant cumulative visual impacts in the North Coyote Valley.

Also, the proposed project has the potential to not be in compliance with 15 applicable local laws, ordinances, regulations, and standards regarding visual resources. These include City of San Jose policies and guidelines pertaining to building height, development along designated trail corridors, permitted land uses in rural scenic corridors, riparian/parkway character, rural building massing, building silhouette, building landscape, rooftop equipment, adjacent property setbacks and screening, building facades blending with their surroundings, and visual screening of incompatible elements.

RECOMMENDATIONS

Staff finds that the Metcalf project would cause significant unmitigable visual impacts and does not comply with a variety of applicable local laws, ordinances, regulations, and standards regarding visual resources. Staff should coordinate with local government staff and the applicant to identify any potential options for bringing the proposed project into compliance with applicable local laws, ordinances, regulations, and standards regarding visual resources. If the Energy Commission decides to approve the project, a statement of overriding considerations should be prepared for visual impacts, and the Energy Commission should adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, and tanks visible to the public in a non-reflective finish and color to blend with the surroundings. The project owner shall treat the exhaust stacks with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

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 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 to the CPM a revised plan.

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: Not later than sixty (60) 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: Protocol: At least thirty (30) days 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: At least 30 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 the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas, including the riparian corridor, and illumination of the vicinity and the nighttime sky is minimized. Exterior floodlighting of structures must not occur. For all parking areas, low-sodium fixtures must be used, fixtures must be visually compatible with the surrounding landscape treatment, luminaire heights must be uniform and not exceed 20 feet, the lighting must be distributed uniformly throughout the parking areas and not exceed 0.5 foot-candles, light sources must not be visible from streets, and any pedestrian pathways must be illumined to a maximum of 0.8 foot-candles. 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;
- There shall be no exterior floodlighting of structures.
- For all parking areas, only low-sodium fixtures will be used and these fixtures will be visually compatible with the surrounding landscape treatment, luminaire heights will be uniform and not exceed 20 feet, the lighting will be distributed uniformly throughout the parking areas and not exceed 0.5 foot-candles, and light sources will not be visible from streets;
- Any pedestrian pathways will be illumined to a maximum of 0.8 foot-candles.
- 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 ninety (90) 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 restore any and all areas that are disturbed during the construction or operation of any portions of the proposed underground utilities.

Protocol: The project owner shall submit a plan for restoring the surface conditions of any rights-of-way disturbed during construction of underground utilities. The plan shall include grading to the original grade and contour and revegetation and restoration of surface conditions of the rights-of-way.

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.

The project owner shall notify the CPM within one week after the grading and revegetation has been installed and is ready for inspection.

Verification: At least sixty (60) days prior to beginning implementation of the surface restoration, the project owner shall submit the plan to the CPM for review and approval and to the City of San Jose or Santa Clara County for review and comment for the portions of the linear facilities under the respective jurisdictions.

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 the surface restoration that it is ready for inspection.

VIS-5 Immediately before beginning use of the 12-acre construction laydown area for the power plant, the project owner shall implement the installation of temporary aesthetic screening along the south and east sides and any of the eastern portion of the north side of the construction laydown area that may be visible to travelers on Monterey Road or passenger trains. The project owner shall also implement the installation of long-term aesthetic screening along the west side of Monterey Road. The temporary aesthetic screening shall remain in place for the duration of the use of the laydown area. Temporary screening shall be high enough to obscure views of most of the lighting, as well as equipment, vehicles, and materials in the area, from the highway, railroad line, and nearby residences to the south. Immediately upon completion of construction of the project, the temporary aesthetic screening shall be removed and the construction laydown area shall be revegetated and restored to its original condition prior to construction or to an improved condition. The goal of the revegetation shall be to maintain the open space character of the site and area. The long-term aesthetic screening shall remain in place and be maintained by the project owner for the life of the power plant project.

Protocol: The project owner shall submit to the CPM for review and approval a specific plan describing its temporary and long-term aesthetic

screening plans, providing evidence that the City of San Jose has been consulted regarding the plans, and attaching any recommendations from the City of San Jose. The plan shall include, but not be limited to:

- detailed plans, at a reasonable scale, which identify the type, character, colors, and other detailed information for the proposed temporary and long-term aesthetic screening;
- a detailed grading plan at a reasonable scale for the long-term aesthetic screening that shows natural-appearing undulating berms within the landscape buffer area along the west side of Monterey Road.
- elevations of the views of the temporary aesthetic screening showing how the objectives of the screening will be accomplished.
- any maintenance procedures; and
- a procedure and plan for removing the temporary aesthetic screening and revegetating the area, including a detailed revegetation plan, at a reasonable scale, which includes a list of proposed plant species and sizes; a discussion of the suitability of the plants for the site conditions and mitigation objectives; and procedures for irrigation, maintenance, and replacement planting.
- 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.
- The temporary and long-term aesthetic screening and revegetation plans and any other plan features shall not be installed before the plans are approved. The project owner shall notify the CPM and the City of San Jose when the plans have been implemented and are ready for inspection.

Verification: At least ninety (90) days prior to the start of use of the construction laydown area for the power plant, the project owner shall submit the proposed temporary and long-term aesthetic screening plans to the CPM for review and approval. The project owner shall also submit the proposed aesthetic screening plans to the City of San Jose for review and comment. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall notify the CPM and the City of San Jose within seven days after implementing the proposed plans that the temporary and long-term aesthetic screening installations are ready for inspection. The owner shall follow a similar schedule and procedures for submittal and inspection of the revegetation plan starting with submittal of the plan at least ninety (90) days before intended removal of the temporary aesthetic screening.

VIS-6 The project owner shall comply with the requirements of Policy 12 of the General Development Plan Standards of the Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area (City of San Jose 1985) regarding screening of truck loading docks and storage and service areas and Guideline 2C of the Riparian Corridor Policy Study (City of San Jose 1994) regarding screening of parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses.

Protocol: The project owner shall submit to the CPM for review and approval and to the City of San Jose for review and comment a plan for screening of truck loading docks, storage and service areas, parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses that conforms to the requirements of Policy 12 of the General Development Plan Standards of the Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area and Guideline 2C of the Riparian Corridor Policy Study. The screening shall be implemented prior to the beginning of operation of the power plant.

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.

The project owner shall notify the CPM within one week after the screening has been installed and is ready for inspection.

Verification: At least sixty (30) days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval and to the City of San Jose for review and comment. 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 screening that the screening is ready for inspection.

VIS-7 Immediately following the beginning of construction of the power plant, the project owner shall implement the installation of aesthetic landscape screening along a portion of Coyote Ranch Road between the power plant and Coyote Ranch in locations that would eventually help screen views from the ranch toward the power plant. Vegetation selected for landscape screening shall consist primarily of plants that are native to the local region and trees that would grow quickly and reach a height of at least 40 feet.

Protocol: The project owner shall submit to the CPM for review and approval a specific plan describing its aesthetic landscape screening plan, including irrigation, along a portion of Coyote Ranch Road Road between the power plant and Coyote Ranch, providing evidence that the City of San Jose has been consulted regarding the plan, and attaching any recommendations from the City of San Jose. The plan shall include, but not be limited to:

- a detailed landscape and irrigation plan, at a reasonable scale, which includes a list of proposed tree and, if needed, shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
- Elevations of the views of the aesthetic landscape screening projected for 10 and 20 years from the time of startup of operation of the facility that show how the planting will appear.
- maintenance procedures, including any needed irrigation; and
- a procedure for replacing unsuccessful plantings.
- If the CPM notifies the project owner that revisions to the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.
- The landscaping screening and any other plan features shall not be installed before the plan is approved. The project owner shall notify the CPM and the City of San Jose when the plan has been implemented and is ready for inspection.

Verification: At least ninety (90) days prior to the start of construction of the power plant, the project owner shall submit the proposed aesthetic landscape screening plan to the CPM for review and approval. The project owner shall also submit the proposed aesthetic landscape screening plan to the City of San Jose for review and comment. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall notify the CPM and the City of San Jose within seven days after implementing the proposed plan that the aesthetic landscape screening installation is ready for inspection.

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September 3, 1999, set 1C
September 16, 1999, set JW-1A
September 17, 1999, set 1D
September 20, 1999, set 1?
October 1, 1999, set 1E
October 15, 1999, set 2B
October 15, 1999, set 1F

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FIGURES

VIEWS OF THE PROJECT SITE

The project site is visible from a variety of locations in the area. The character and quality and visual sensitivity associated with views of the project site from these locations are identified in the table below and described in detail in Appendix__.

VIEWS FROM BLANCHARD ROAD AREA

Blanchard Road is located approximately 900 feet southeast of the project facility site. A cluster of four residences is located along the road directly southeast of the facility site. One of these homes has unobstructed views of the project site about 800 feet away. The project site appears to be visible from areas around the other homes and from the road itself. Two additional residences are located along the road farther to the west; however views of the project site from these homes appear to be blocked by Tulare Hill. Future views of the project site would be by workers at the North Coyote Valley Campus Industrial Area.

VISUAL SENSITIVITY

Because views of the project site are from in and around residences with high viewer sensitivity and the site would be within the foreground distance zone, visual sensitivity would be high. Because views in the near future would be by workers in the NCVCIA with a high concern for views and the project site would be within the foreground distance zone, visual sensitivity for future views would also be high.

VISUAL QUALITY

Views from the Blanchard Road area are of open agricultural fields, a distinctive line of mature trees, and the shoulder of the grass-covered Tulare Hill. Visual Resources Figure 4 shows the view from KOP 1. Several tall power transmission towers are visible along the brow of the hill and several protrude above the trees near the base of the hill. The towers along the brow of the hill are widely separated, somewhat light and translucent in form, and although profiled against the sky, tend not to dominate their surroundings. The towers near the base of the hill are closer, stand out more against the sky, and are more noticeable; however, they are partially screened by the trees and tend not to dominate the view. These elements slightly diminish the intactness, unity, and vividness of the view because their form and line contrast with the otherwise natural forms in the view. Because power transmission lines are somewhat common elements in the regional landscape and these towers are not dominant in the overall view, they do not substantially affect the quality of the overall view. Therefore, based on the dominance of natural forms and the strong display of rural character, the visual quality of this view is considered moderately high.

VIEWS FROM NORTHBOUND MONTEREY ROAD, RAILROAD, COYOTE, AND RESIDENCES

The project site is visible from Monterey Road, the railroad, the community of Coyote, and several residences along Monterey Road south of the site. Monterey Road is a well-traveled thoroughfare running northwest and southeast through the Coyote Valley. The project site is located within 150 feet of the road and is highly visible in foreground views for people traveling either north or south along the road. Northbound travelers would have fairly long duration views of the site and the site would be visible within their primary viewcone. A traffic light at the road's intersection with Blanchard Road increases the viewing time for some traffic that would be stopped at the light. With development of the North Coyote Valley Campus Industrial Area and urban reserve, numbers of viewers traveling along Monterey Road would increase substantially in the near future. Visual Resources Figure 5 shows the view from KOP 2.

Customers, employees, and users of the commercial and business establishments and Grange Hall in the small rural community of Coyote would also have foreground views of the site. Also, the site is visible from several residences located along the east side of Monterey Road and to travelers from trains using the railroad line along the site's east side. The two more northerly residences would have views of the site within the foreground distance zone and a third residence, located just over ½-mile from the site, would have views of the site in the middleground. Railroad passengers would have foreground views of and look directly onto the project site from their elevated positions on the trains for fairly short durations.

VISUAL SENSITIVITY

It is assumed that viewer sensitivity is generally moderate for people traveling on Monterey Road. However, the project site is in the foreground distance zone of views by high numbers of people traveling northbound on Monterey Road and these views of the site are within the travelers' primary view cone and of fairly long duration. Travelers on trains would include people traveling for pleasure with high concern for visual quality; this viewer group has fairly short-duration but immediate foreground views of the project site. The project site is also visible in foreground views by residents with high viewer sensitivity from in and around their residences. For these reasons, visual sensitivity would be moderately high for views by northbound travelers on Monterey Road, viewers in Coyote, and train travelers and high from in and around residences along the east side of the road.

Future views from trains would continue to be of moderately high visual sensitivity and future views from residences would continue to be high. Because views from the road in the near future would be by high numbers of NCVCIA workers with a high concern for visual quality, visual sensitivity for future views from the road would be high.

VISUAL QUALITY

Views toward the project site for northbound travelers along Monterey Road are primarily of the roadway, railroad corridor, and Tulare Hill. South of the small community of Coyote, a row of large walnut trees along the southwest side of the road generally screens views of the project site for northbound travelers. North of Coyote, views toward the project site are not screened. These views from the road, Coyote, and residences are of the roadway, railroad, scattered trees, power poles, light standards, signs, open agricultural fields, the tall grove of trees on the project site, grass-covered Tulare Hill, and power transmission towers along the brow and near the eastern base of the hill (see Visual Resources Figure 5). For northwesterly views toward the project site, the elements within the road and railroad corridor in the viewers' immediate foreground somewhat reduce the overall intactness, unity, and vividness of views. The power transmission towers also affect the intactness of views of the more natural forms, lines, textures, and colors of the open agricultural land, grass-covered hillside, and tall trees near the base of the hill. However, these softer, more natural forms tend to dominate these overall views toward the project site. Overall visual quality for northwesterly views from the road, Coyote, and residences is moderate given the dominance of natural forms and elements that reinforce or are commonly seen in the regional rural environment in combination with the other elements in the roadway corridor. Because views of the project site from trains do not include the elements of the roadway corridor, the intactness, vividness, and unity of these views is moderately high; therefore visual quality is moderately high.

VIEWS FROM FUTURE OVERCROSSING FOR CAMPUS INDUSTRIAL AREA

The master plan for the North Coyote Valley Campus Industrial Area identifies the need for a major access road to be developed as a parkway connecting Highway 101 to the future development. This primary northern access road is identified as a major gateway to the development that would cross over Coyote Creek, Monterey Road, and the railroad. Merging with a restored Fisher Creek, the parkway is intended to become a major design feature of and the major organizing circulation route for the development. The City of San Jose (1985) has stated that the elevated overcrossing of Monterey Road and the railroad "will introduce the Valley development to visitors" and the "views of the natural Santa Teresa Hills [would] draw the traveler into the Valley". Visual Resources Figure 6 shows an artist's concept of the view straight ahead along the parkway from the overcrossing at Monterey Road. Visual Resources Figure 2 is an existing view straight along the intended parkway southwest from the future overcrossing. Visual Resources Figure 7 shows the view from KOP 3 looking northwest from the intended overcrossing toward the project site. The overcrossing would be located approximately ½-mile from the project site and it would afford broad views of the valley, hills, and proposed Campus Industrial Area, including the project site.

VISUAL SENSITIVITY

Presently, the overcrossing and this view do not exist and visual sensitivity is low. However, the gateway overcrossing is a central feature of the planned Campus Industrial development that is intended to be constructed in the foreseeable future. For future views from the overcrossing, the project site would be at the outer edge of the foreground distance zone for high numbers of viewers entering the primary gateway to the Campus Industrial Area. Viewers progressing along the parkway from the freeway interchange would view the project site from the elevated parkway for a moderate period of time. These viewers, which would consist primarily of NCVCIA workers and visitors, would have a high concern for visual quality. For these reasons, visual sensitivity would be high for future views of the project site from the gateway overcrossing.

VISUAL QUALITY

The elevated position of the gateway overcrossing would afford viewers broad vistas of the rural valley, scenic Santa Teresa Hills, and future Campus Industrial development. Views would be primarily focused straight ahead along the proposed parkway and toward the scenic hills. However, views to the northwest toward the project site would be an important part of the sweeping vista from the gateway overcrossing. Views toward the project site are of extensive agricultural fields, a cluster of rural homes and farm buildings, riparian and other trees near the base of the hill, and the grass-covered Tulare Hill. Tall palm and other trees around the low buildings help blend them with their surroundings and reinforce a strong rural image typical, yet increasingly scarce, in the valley and the region. The power transmission towers along the brow of Tulare Hill are noticeable but not strong elements of the overall scene. Although the railroad tracks in the immediate foreground are strong linear elements, they reinforce and add to the rural character of the scene. Depending on how the railings, gateway sculptural elements, and landscaping for the future overcrossing are designed, the tracks may not be strong elements of the immediate foreground, but would be likely to remain visible farther to the northwest.

Overall, the view toward the project site is picturesque and rural in character. The long reflective roof of the farm building and the distant power transmission towers tend to reduce the intactness and vividness of the view slightly; however, the view is generally of moderately high vividness and intactness and moderate unity. For these reasons, the visual quality of the view toward the project site is moderately high.

VIEWS FROM SANTA TERESA BOULEVARD

Santa Teresa Boulevard is a four-lane arterial road that runs northwest and southeast through the western side of Coyote Valley. The road's median strip and edges are well-landscaped, anticipating the development of the Campus Industrial Area. Presently, the boulevard carries moderate traffic, but it will be an important and heavily-used thoroughfare once the area is developed for

Campus Industrial uses. It is expected to receive particularly heavy use once the urban reserve area to the south is developed. Also, the City of San Jose plans to extend its light rail line along the boulevard when development of the area increases the need for public transit in this area.

Views toward the project site are primarily by northbound traffic. Visual Resources Figure 8 shows the view from KOP 4. The project site is only visible from the road in the middleground from about a mile south and farther because the southern toe of Tulare Hill blocks views of the site from portions of the road farther to the north. Views in the direction of the project site are of the landscaped edge of the boulevard, agricultural fields stretching across the valley, scattered trees, rural-looking homes and buildings near the base of the Silver Creek Hills, and the rolling grass-covered hills themselves. Power transmission lines are visible running up the hillside. The tops of metal towers at the Metcalf Substation are also visible, but are partially screened by trees and are not a strong element in the view.

VISUAL SENSITIVITY

The project site is presently in the middleground distance zone of views by moderate numbers of people traveling northbound on Santa Teresa Boulevard. These views of the site are within the travelers' primary view cone and of fairly long duration. Future views of the site would be by higher numbers of viewers with a high concern for visual quality of the area. Because the project site is in the middleground distance zone for views from the boulevard and the current number of viewers is moderate, visual sensitivity is presently moderate. However, because of the expected high number of future viewers with high concern for visual quality, future visual sensitivity would be moderately high for these middleground views of the project site.

VISUAL QUALITY

Views toward the project site for northbound travelers on Santa Teresa Boulevard are predominately of open agricultural fields and grass-covered hillsides (see Visual Resources Figure 8). These views are characteristic of the rural environment of the area. The mix of buildings and trees in the middleground across the field tend to support this rural character. Although the power lines running up the hillside and the towers at the substation are noticeable, they do not detract appreciably from the intactness of the view. The landscaped edge of the roadway in the foreground is attractive and provides a strong sense of design unity. However, the recently upgraded four-lane arterial boulevard appears orderly and modern and contrasts somewhat with the rural character of the views beyond the roadway corridor. Overall, for views toward the project site from the boulevard, intactness, unity, and vividness are moderately high and visual quality is moderately high.

VIEWS FROM HIGHWAY 101

Highway 101 is a highly-traveled freeway running northwest and southeast along the lower slopes of the Silver Creek Hills on the northeast side of the Coyote Valley. The highway through the valley is designated as a Landscaped

Throughway and Rural Scenic Corridor by the City of San Jose (1994) and is considered the major southern gateway to the city. For the large numbers of northbound travelers on this major route, views of the valley and surrounding hills provide important first impressions of the area. Also, Santa Clara County (1994) has designated Highway 101 as a scenic highway in recognition of the aesthetic importance of this area.

The project site is visible intermittently from the highway for both northbound and southbound travelers. For southbound travelers, the site is visible from the highway in the middleground to the south and southwest in the vicinity of Parkway Lakes and the Metcalf Substation. For northbound travelers, the project site is visible intermittently in the middleground from various points along the highway and in the foreground from the highway in the vicinity of Coyote Ranch. Visual Resources Figure 9 shows the view from KOP 5. The project site is generally in the viewcone of both northbound and southbound travelers; however, the site is nearer to the highway for northbound viewers. Views toward the site from the highway are of scattered trees and shrubs within and near the landscaped highway corridor, trees within the riparian corridor along Coyote Creek between the site and highway, and grass-covered Tulare Hill. Power transmission towers on Tulare Hill and at the Metcalf Substation are visible in most views toward the site. The towers at the substation are highly visible in most views from the north for south-bound travelers.

VISUAL SENSITIVITY

The project site is in the middleground and foreground distance zones of views by high numbers of people with a high concern for visual quality traveling both north and south on Highway 101, a locally-designated scenic highway and Rural Scenic Corridor through the Coyote Valley. Views of the site are within travelers' view cones and are intermittent. For northbound travelers, the site is visible in the foreground distance zone for a fairly brief length of time. Because the site is visible in the foreground to high numbers of viewers with a high concern for visual quality and the highway in this area is designated as scenic, visual sensitivity is high.

VISUAL QUALITY

Views toward the project site for southbound travelers along Highway 101 are primarily of the rural and picturesque valley, surrounding hills, Tulare Hill, riparian trees along Coyote Creek, the landscaped highway corridor, and the substation. For views from the north, the project site is mostly in the middleground and the dense clusters of transmission towers at the substation near the freeway tend to dominate the view and substantially reduce the intactness, unity, and vividness. Visual quality for southbound views from the highway is moderately low to moderate.

For views from the south and east, the dominant visual elements are the landscaped highway corridor, trees in the riparian corridor, the cluster of palm trees protruding above Coyote Ranch, and the grass-covered Tulare Hill (see

Visual Resources Figure 9). Towers at the substation are further to the north and do not dominate the view toward the site. The towers at the base of and along the brow of Tulare Hill tend to reduce the intactness of the view slightly. For northbound travelers, overall views of the rural valley are highly scenic and vividness, intactness, and unity of these views is generally high. For foreground views of the project site from the highway, vividness is moderate and intactness and unity are moderately high. Visual quality for northbound views from the highway is moderately high.

VIEWS FROM PARKWAY LAKES

Parkway Lakes is a recreation area located between one-half and one mile north of the project site between Monterey Road and Highway 101. The facility is on Santa Clara County Parks and Recreation land and is part of the Coyote Creek Parkchain. The creek corridor and county bike trail run adjacent to the facility along its western edge. The facility's main purpose is for fishing. Large numbers of recreationists use the facility with the highest use occurring on summer weekends. Recreationists using the trail along the creek also have views toward the project site. Views south toward the project site are of open water, mostly barren banks, and some low vegetation at the facility; Tulare Hill; riparian trees along the creek corridor; and the power transmission towers extending along the brow of Tulare Hill and at the Metcalf Substation. Visual Resources Figure10 shows the view from KOP 6.

VISUAL SENSITIVITY

The project site is primarily in the middleground of views to the south from the Parkway Lakes recreation area and the county trail. Visitation at the facility and use of the trail is heavy and viewers tend to have opportunities for long-duration views. Visitors are recreationists that generally have a high concern for visual quality. Because the site is visible in the middleground to high numbers of viewers with a high concern for visual quality, visual sensitivity is moderately high.

VISUAL QUALITY

Views toward the project site from the recreation area are primarily of open water, mostly barren banks, and some low vegetation at the facility; grass-covered Tulare Hill; riparian trees along the creek corridor; and the power transmission towers extending along the brow of Tulare Hill and at the Metcalf Substation. The Coyote Valley and surrounding hills, other than Tulare Hill, are not readily visible from the facility. Although the clustered towers at the substation are noticeable in views toward the site, they are generally to the east, are partially screened near their bases, and do not dominate the view toward the site. However, the presence of towers along the generally level horizon tend to somewhat reduce the intactness, unity, and vividness of the views south. Although views of the open water and nearby riparian trees add to the visual variety and interest, views of the mostly barren shorelines and banks tend to reduce the unity and vividness of these views. For views of the project site from the Parkway Lakes recreation area, vividness, intactness, and unity are moderate and visual quality is moderate.

VIEWS FROM COYOTE RANCH AND COYOTE CREEK TRAILS

Coyote Ranch is a privately-operated recreation facility on public land that is part of the Coyote Creek Parkchain and owned by the Santa Clara County Parks and Recreation Department. The facility includes an historic 1880 ranch house that is used as a residence and its surrounding grounds, including a large picnic grove, open play fields for sports and games, and a gravel parking area. Typical events staged at the facility include catered picnics, conventions, hayrides, parties, barn dances, and other special events. The facility receives heavy recreational use especially from May through October. The project site is within ½-mile to the west of and readily visible in the foreground of views from Coyote Ranch. Although views of the project site from the residence itself are largely screened by trees, the site is visible from the surrounding grounds and may be visible from the upper windows of the residence. Views toward the site from the recreation facility are of riparian trees within the nearby Coyote Creek corridor, grass-covered Tulare Hill, and open space areas at the facility. Visual Resources Figure 11 shows the view from KOP 7. Power transmission towers on Tulare Hill and to the north of the recreation facility are visible in views toward the project site.

The Coyote Creek bicycle and equestrian trails also run through the riparian corridor in this area. The bicycle trail is heavily used by recreationists and, to a lesser degree, by bicycle commuters. The equestrian trail receives far less use. Because the trails run mostly through and are on the east side of the riparian area, views of the project site are generally blocked by the dense riparian vegetation. There may, however, be some areas where the project site is visible from portions of the trails, but more detailed investigations would need to be done to determine this.

VISUAL SENSITIVITY

The project site is in the foreground distance zone of views by high numbers of recreationists that visit Coyote Ranch and have a high concern for visual quality. Also, the project site is visible in the foreground of views from the facility grounds by residents that live at and operate the recreation facility. For these reasons, visual sensitivity for views of the project site from Coyote Ranch is high. It is assumed that the project site is not visible from the county trail.

VISUAL QUALITY

Views toward the project site from the recreation facility are dominated by the riparian trees within the nearby Coyote Creek corridor, the grass-covered Tulare Hill, and the open space areas in the near foreground at the facility. Power transmission towers on Tulare Hill and to the north of the recreation facility tend to slightly reduce the overall intactness, vividness, and unity of the moderately high quality views of natural forms and features. Most of the transmission towers closest to viewers at the facility are somewhat farther to the north and do not dominate the view toward the site. The towers at the base of and along the brow of Tulare Hill tend to reduce the intactness of the view slightly. Views from Coyote Ranch are dominated by scenes representative of

the rural landscape character of the area and, within this context, are of moderately high visual quality.

VIEWS FROM SOUTHBOUND MONTEREY ROAD AND RAILROAD

Monterey Road is a well-traveled thoroughfare running northwest and southeast through the Coyote Valley. Numbers of viewers traveling along Monterey Road are expected to increase substantially in the near future with development of the North Coyote Valley Campus Industrial Area and urban reserve areas to the east and south. The project site is located within 150 feet of the road and is highly visible in foreground views for people traveling either north or south along the road. The site is also highly visible in foreground views, although for a brief duration, by train travelers. Travelers heading south on Monterey Road and trains have foreground views of the project site as they transition from the more developed and suburban south Santa Clara Valley and Edenvale area through the Coyote Narrows and into the more rural and scenic Coyote Valley. The project site becomes visible for southbound travelers within their primary viewcone and immediately to their right as they pass the toe of Tulare Hill and begin to have more expansive views of the rural Coyote Valley. Views toward the project site from the road vary as the viewer progresses south. The various elements of these varied views include the grass-covered and rocky toe of Tulare Hill; the railroad berm and grade cutting across the base of the hill; riparian trees and shrubs along Fisher Creek; the grove of large walnut and valley oak trees stretching across the project site; power lines extending across the road; several tall power transmission towers at the base of the hill near the road; wood power poles and a billboard sign adjacent to the road; and various dilapidated structures and piles of building materials and debris. Visual Resources Figure 12 is a view from KOP 8 looking south toward the project site for southbound travelers on Monterey Road just before the site becomes visible to the viewer. Visual Resources Figure 13 is a view looking south from Monterey Road for southbound travelers just after they pass the project site. For travelers on the road, the railroad berm generally screens views of the dilapidated structures and debris on the project site; however, for train travelers, these elements are highly, although briefly, visible in foreground views.

VISUAL SENSITIVITY

The project site is in the foreground distance zone and primary view cone for views by high numbers of people traveling southbound on Monterey Road. Although it is not known what the current travelers' level of concern for visual quality may be, it is assumed that the majority of travelers are local workers, commuters, and others with a moderate concern for visual quality. Although the duration of views of the project site is fairly brief and the concern of viewers is moderate, the proximity of the site to the road and passing viewers, its position in the primary view cone, and the large number of daily viewers, makes visual sensitivity moderately high for southbound viewers on Monterey Road. In addition, travelers on trains include people with high viewer sensitivity with short-duration, but immediate, foreground views of the site. Visual sensitivity for views from trains would also be moderately high.

Because views from the road in the near future would be by high numbers of NCVCIA workers with a high concern for visual quality, visual sensitivity for future views from the road would be high. Future views from trains would continue to be of moderately high visual sensitivity because of relatively fewer viewers with relatively brief views of the project site.

VISUAL QUALITY

Views south toward the project site from Monterey Road are of the grass-covered and rocky toe of Tulare Hill; the railroad grade cutting across the base of the hill; riparian trees and shrubs along Fisher Creek; the grove of large walnut and valley oak trees stretching across the project site; power lines extending across the road; several tall power transmission towers at the base of the hill near the road; and wood power poles and a billboard sign adjacent to the road. Various dilapidated structures and piles of building materials and debris on the project site are generally not visible from the road because these elements are screened from view by the railroad berm. These elements are, however, visible in the immediate foreground from trains.

Although views include natural forms and elements of the regional rural landscape, they also include a variety of discordant elements in proximity to viewers that reduce the intactness, unity, and vividness of these views. The more discordant visual elements appear early in the viewers' experience as they progress south past the toe of the hill. As the viewers continue south past the cut slope of the railroad, the transmission towers and lines, and the billboard, the views become increasingly more natural, unified, and intact. For train travelers, views of the northern portion of the project site include scattered shrubs, various dilapidated structures, and piles of building materials and debris and are generally low in intactness, unity, and vividness.

However, the area of North Coyote Valley that includes the project site is an important transition area, or visual gateway, for southbound viewers as they enter the rural and open valley from the more developed and urban areas of San Jose to the north. As south-bound viewers traveling on either the road or railroad emerge from the Coyote Narrows into the North Coyote Valley and pass the grove of mature trees on the site, the visual quality of views across the southern portion of the project site improves substantially from moderately low to moderately high. Although the railroad berm screens views of the ground plane of the project site for southbound travelers on the road, the existing views across the southern portion of the site south of the central grove of trees include riparian trees, agricultural buildings, rural homes, and the Santa Teresa Hills in the middleground and background. For train travelers, these views also include open agricultural fields. For southerly views along this portion of Monterey Road and the railroad just south of the central grove of trees on the power plant site, the visual quality is moderately high.

VIEWS FROM BASKING RIDGE AREA

The Basking Ridge area is a fairly new residential subdivision located about 1½ miles north of the project site in the lower hills just east of Highway 101.

Several homes in the southern part of the subdivision have views south toward the project site. Views south from this area are of the freeway, grassy open space areas adjacent to the freeway, the riparian corridor of Coyote Creek, Tulare Hill, transmission towers along the brow of the hill, and ridges and peaks of distant hills. Visual Resources Figure 14 shows the view from KOP 9.

VISUAL SENSITIVITY

Because views south from the Basking Ridge area are from residences with opportunities for long-duration views, viewer sensitivity is high. However, because the project site is in the middleground of views from this area, the visual sensitivity for these more distant views of the project site is moderately high.

VISUAL QUALITY

Views south from the Basking Ridge residential area include the natural forms of the trees massed along the Coyote Creek riparian corridor, the grass-covered slopes of Tulare Hill, ridges and peaks of distant hills, and grassy open space areas adjacent to the freeway. Transmission towers along the brow of the Tulare Hill are noticeable and reduce the intactness and unity of the view somewhat. However, the linear Highway 101 freeway in the near foreground contrasts strongly with the natural forms and also reduces the intactness and unity of views south toward the project site from this area. For views of the project site from the Basking Ridge residential area, vividness, intactness, and unity are moderate and visual quality is moderate.

VIEWS FROM FISHER CREEK CORRIDOR

Fisher Creek forms the boundary along the west and north sides of the project site. The North Coyote Valley Campus Industrial Area Master Development Plan (City of San Jose 1985) identifies that a multiple-use trail for pedestrians, equestrians, and bicyclists would be developed along Fisher Creek in this area in the future. The Circulation diagram (City of San Jose 1985, p. 9) shows the bicycle trail running through approximately the middle of the project site with the pedestrian and equestrian portions following the creek channel to its intersection with the UPRR. The Scenic Routes and Trails Diagram in the San Jose 2020 General Plan (City of San Jose 1994) also identifies a Trails and Pathways corridor along this portion of Fisher Creek. The City of San Jose has stated that the trail improvements “would be required regardless of General Plan designation” and are anticipated to be “made in conjunction with the development of the North Coyote Valley Campus Industrial Area” (City of San Jose 2000, p. 2).

VISUAL SENSITIVITY

The land along this portion of the creek and proposed trail corridor is currently privately owned and not accessible to the public. For this reason, the visual sensitivity for views of the project site from the creek corridor is currently low. However, with development of the trail system along the creek corridor in the foreseeable future, the project site would be highly visible in immediate

foreground views by high numbers of recreationists with high viewer sensitivity. For these reasons, future visual sensitivity of views of the project site would be high.

VISUAL QUALITY

Views from the trail creek and trail corridor that include the project site are highly variable in quality. Views of the project site from the trail corridor include open agricultural fields, rustic wood fences, the grove of large walnut and valley oak trees stretching across the project site, the natural forms of the riparian trees and shrubs along the corridor, the grass-covered slopes of Tulare Hill, ridges and peaks of the Silver Creek and Santa Teresa Hills, and other elements of natural and rural character (see Visual Resources Figures 15 and 16). Visual Resources Figure 15 shows the view from KOP 10. Many of the views from the creek and trail corridor are of high intactness and vividness. However, some views that include the project site also include elements that substantially reduce the intactness, vividness, and unity of these views (see Visual Resources Figures 17 and 18). These elements include near views of power transmission towers; denuded and eroded creek banks; and dilapidated structures, junked cars, and debris currently on the northern portion of the project site. Depending on the viewers' location and direction of travel along the trail corridor, visual quality for views that include the project site range from low to high.

VIEWS FROM COYOTE VALLEY URBAN RESERVE

The San Jose 2020 General Plan (City of San Jose 1994) designates the Coyote Valley Urban Reserve as an area of land set aside for future urban development. Land uses in the reserve would include housing, schools, parks, commercial facilities and other uses. The reserve consists of some lands just east of Monterey Road and south of Coyote Ranch Road as well as an extensive land area south of the designated campus industrial area. Portions of the urban reserve lands are about ½-mile from the project site and extend south several miles. The majority of urban reserve lands are over 2 miles from the project site. Development of the urban reserve would be allowed only after building permits are issued for construction of facilities that would provide at least 5,000 new jobs in the campus industrial area. Issuance of building permits for construction of the proposed Cisco Systems headquarters within the campus industrial area would meet these criteria.

VISUAL SENSITIVITY

Views from the urban reserve area that would include the project site would be by residential viewers with high viewer sensitivity from in and around their homes in the foreseeable future. In addition, some existing rural residences with high viewer sensitivity located in the south portion of the urban reserve area have existing views north toward the project site. The project site would be in the far middleground and background distance zones for most views toward the site; however, the project site could be visible in the far foreground and near middleground of some views. Although development of the campus industrial area between much of the urban reserve area and the project site

could potentially screen views of the project site from residences, the project site could be visible from some future residences. In addition, some rural residences currently located within the urban reserve area may have views of the project site in the far middleground. Views from the urban reserve area are potentially from residences with opportunities for long-duration views by viewers with high viewer sensitivity. However, because the project site is in the middleground and far foreground of views from this area, visual sensitivity is moderately high for both the existing rural residences and future residential development.

VISUAL QUALITY

Views north toward the project site from the urban reserve area are of open agricultural fields, Tulare Hill, the Silver Creek Hills, clusters of trees, and scattered farm complexes. Transmission towers along the brow of Tulare Hill are visible but not dominant elements of the views and the Metcalf Substation is visible in some views. Visual Resources Figure 19 shows the view from KOP 11 looking north toward the project site from an area of the urban reserve about 2 miles from the site. The character of existing views is rural and their visual quality is moderately high to high based on generally high unity and intactness and moderate vividness.

CULTURAL RESOURCES

Gary D. Walker and Dorothy Torres

INTRODUCTION

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 may be found nearly anywhere in 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 ground or may be found at varying depths beneath the surface. In some areas of the state, a sequence of settlements on the same site may cover multiple layers of cultural resources. 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 Metcalf Energy Center (MEC) 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 RESOURCES

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area; these resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 10,000 years ago and extended through the 18th century when the first Euro-American explorers settled in California.

HISTORIC RESOURCES

Historic archaeological resources are those materials usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record; they may include archaeological deposits, sites, structures, traveled ways, artifacts, documents, or other evidence of human activity. Under federal and state requirements, cultural resources must be greater than fifty years old to be considered of potential historical importance.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial site, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 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, section 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 USC 470, commonly referred to as Section 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 Section 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, Section 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 Section 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, Section 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, Section 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, Section 5097.5 states that any unauthorized removal or destruction of archaeologic or paleontologic 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, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.

- Public Resources Code, Section 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, Section 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, Section 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, Section 21083.2 states that if a project may affect a resource that has not met the definition of an historical resource set forth in section 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, Section 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, Section 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, Section 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, Section 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, Section 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, Section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 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 over local laws, it typically ensures compliance with local laws, ordinances, regulation, standards, plans, and policies. The General Plans of the County of Santa Clara and the City of San Jose are addressed below because the project site would occupy approximately 10 acres in the county and 4 acres in the city (Calpine/Bechtel 1999a, p. ES-1).

SANTA CLARA COUNTY

The County of Santa Clara’s General Plan defines two types of heritage resources, natural and man-made. Both types of resources deserve special protection to preserve them for future generations. The kinds of resources termed heritage resources are: historical sites, structures, and areas; archeological and paleontological sites and artifacts; and historical and specimen trees (SCCGP 1999b, p. H-36).

The County regards heritage resources as important due to a variety of factors. The resources are important because they may prove to be potentially scientifically valuable or possess cultural and historical value and “place” value. These resources provide a sense of place that defines and distinguishes Santa Clara County from all other places.

According to Santa Clara County, heritage resources should be considered the birthright of successive generations and if integrated with new development, heritage resources will immeasurably enrich the experience of urban and rural landscapes. Santa Clara County’s approach to protecting heritage resources is threefold. The County will do the following:

- Inventory and evaluate heritage resources;

- Prevent or minimize adverse Impacts on heritage resources; and
- Restore, enhance, and commemorate resources.

Santa Clara County seeks first to preserve, restore, and commemorate heritage resources of greatest value and secondly to preserve as much of the heritage value of a resource as possible (SC 1999b, p. H-37).

CITY OF SAN JOSE

The General Plan of the City of San Jose asserts that the City has a long colorful heritage that is valuable in adding to a sense of community identity. The City of San Jose seeks to do this by promoting an awareness of San Jose's historic and archaeological heritage.

The City's goal is preservation of historically and archaeologically significant structures, sites, districts and artifacts. The City has developed an eleven-point plan that illustrates the City's policy:

Preservation of irreplaceable historic and archaeological resources should be a key consideration in the development review process.
The City should use the Area of Historic Sensitivity overlay and landmark designation process to promote and enhance the preservation process.
An inventory of significant structures should be maintained and promoted.
Areas of numerous significant sites or structures should be considered for inclusion and preservation as Historic Preservation Districts.
New development should be designed to be compatible with nearby designated historic resources.
The City should foster rehabilitation of buildings and offer financial incentives to assist in the rehabilitation.
Historic structures proposed for demolition should be considered for relocation.
The City requires archaeologically sensitive areas be investigated during the planning process and appropriate mitigation efforts should be incorporated into the project design.
If Native American burials are encountered during construction, development activity should cease until examination and reburial in an appropriate manner is accomplished.
Heritage trees should be maintained and protected in a healthy state.
The City should encourage the appropriate Federal and State programs that provide tax and other incentives for preservation of resources (SJ 1999b, pp. 83-85).

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

Santa Clara Valley lies between the Santa Cruz Mountains to the west and the Diablo Range to the east. It is an area of complex geology and many seismic faults (Calpine/Bechtel 1999a, p. 8.15-1). The area's climate is Mediterranean and this temperate climate has afforded the development of numerous species, diverse

habitats, and recreational resources (Calpine/Bechtel 1999a, p. 8.2-1). Santa Clara County encompasses 1,300 square miles and is located at the southern end of San Francisco Bay (Calpine/Bechtel 1999a, p. 8.4-1). The topography of the Coyote Valley area consists of a series of narrow elongated valleys rimmed by adjoining ridges. The northern part of the area is an open flat valley representative of the bay-estuary-coastal plain transition that merges with the San Francisco Peninsula geographic region.

PROJECT VICINITY DESCRIPTION

The project site is located just west of Monterey Road, between Metcalf Road to the north and Blanchard Road to the south. The site of the proposed Metcalf Energy Center is located in a narrow valley, approximately 8 miles long by 3 miles wide, (Calpine/Bechtel 1999a, p. 8.14-1) drained by Coyote Creek. Much of the valley is rural or in agricultural production. Just beyond Tulare Hill, which rises to the northwest of the project, there are numerous residential areas located just over one half mile from the proposed project. The area contains many habitats and has long been a desirable habitation site for human occupants. The project vicinity is the location of several sites important to the understanding of the pre-history of California (Daniel et.al. 1983; Calpine/Bechtel 1999b, p. 8.3-3).

There are two creeks in the immediate vicinity of MEC. The levees of Fisher Creek, the smaller of the two, constitute the western and northern boundaries of the project site (Calpine/Bechtel 1999a, p. 8.14-2). Fisher Creek flows into Coyote Creek approximated 500 feet north east of the project site. A floodplain exists in the area of Coyote Creek, making the likelihood of encountering intact resources underneath silt deposited by floods moderately high (Calpine/Bechtel 1999a, p8.3-4).

Refer to the **PROJECT DESCRIPTION** section of this document for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

Archaeological literature indicates that early residents of California typically lived near water sources that could provide them with access to a wide variety of plant and animal resources. The Santa Clara Valley was supplied by Coyote Creek and other smaller seasonal sources of water. Although traces of human occupation provide evidence for habitation in this area for at least 11,500 years, it is likely that rising seas and deposits of sediments in the area hide sites that date back approximately 15,000 years (Calpine/Bechtel 1999b, p. 8.3-4).

ETHNOGRAPHIC BACKGROUND

Authorities disagree concerning the existence and location of previous Native American villages in the Coyote Valley. However, they do agree that there were numerous villages or seasonal camps, used to exploit seasonal resources, in or near the project area. At the time of Spanish contact in 1770, the Costanoan people (also known as Ohlone) inhabited the area that extended from the central California Coast east to the Diablo Range. The triblet that occupied the vicinity of the project site was known as the Tamyen (Tamien). Spanish mission records and archaeological data indicate that in 1770 there appear to have been 1,000 to 1,200

Tamyen living in the area. The Tamyen were broken down into additional tribelets. The area of the San Juan Bautista Tribelet corresponds roughly with that of the project. Sources differ as to whether the Coyote Valley was an area where permanent villages were established, but it is likely that the area was at least the location of temporary campsites over hundreds of years (Calpine/Bechtel 1999b, p. 8.3-7).

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. It is not possible to accurately trace the exact routes of Spanish missionaries in California, but it is likely that many of them passed through the project area. Mission Santa Clara would have been the most likely source of impact on the indigenous people of the valley. The AFC divides the historic period of Santa Clara Valley into three periods: the Spanish period which extended from 1760 to 1821, the Mexican Period spanning 1821 to 1848; and the American Period beginning in 1848 and continuing to the present (Calpine/Bechtel 1999a, p. 8.3-8).

RESOURCES INVENTORY

LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, consultants to the applicant conducted a literature search and reviewed site records and maps at the Northwest Information Center of the California Historical Resources Information System (CHRIS). Although the applicant did not define the dimensions of the Area of Potential Effect (APE), the literature search which included the project APE and areas within one-mile of the APE, indicated that numerous surveys had been previously conducted in the area (Calpine/Bechtel 1999b, p8.3-9). For the field survey, the consultant to the applicant chose to survey an area within 75 feet on each side the center line of proposed linear facilities (a 150 foot corridor) where feasible and appropriate (Calpine/Bechtel, 1999b, p. 8.3-20). For the scope of staff's analysis, the 75 foot measurement shall define the APE for the project site and all the linear facilities. The record search revealed that 136 cultural resource studies have been conducted within the project APE and/or a one-mile radius of the power plant site area and project linears. Staff will conduct an additional literature and records search at the appropriate CHRIS in the near future. Results of that search will be provided in the Final Staff Assessment.

FIELD SURVEYS

A pedestrian field survey of selected MEC project elements was conducted on March 8 and 9, 1999, by Dr. James C. Bard and Mr. Robin McClintock using 10-meter intervals between survey transects. This intensive survey was performed on the proposed plant site location and a strip of land immediately adjacent to the south of the proposed site. Where feasible and appropriate, 75 feet on each side of linear centerlines was surveyed. The proposed and alternative access roads, water lines that are no longer proposed routes, transmission line, transmission line

Alternative 1, and gas line segments 1,2,3,4, and 5 were also surveyed (Calpine/Bechtel 1999b, p. 8.3-20). Two discrete archaeological loci were identified on the project site. Subsequent backhoe trenching did not reveal a subsurface component to these loci (Calpine/Bechtel 1999k, Confidential Attachment CR-35, p.21).

ARCHITECTURAL RECONNAISSANCE

During the initial cultural resources survey on March 8 and 9 1999, the project team did not observe any potentially significant historic buildings or structures within the proposed MEC plant site, or along the access road, domestic water line, recycled water line, electrical transmission, or gas line routes (Calpine/Bechtel 1999b, p. 8.3-22). However, there are properties in the vicinity of the project that may have historic importance. The potential historic resources are a water tower, depot, and feed and grain warehouse located between Monterey Road and the Union Pacific Railroad (UPRR) tracks that may be eligible for listing in the NRHP as a Historic District. The Ramelli Ranch, north of Sobrato Internal Road and east of Monterey Road, appears to be NRHP eligible as a complex. In addition, the Lester Farm complex and the former Encinal School may each be NRHP eligible. None of these structures will be impacted by the project (Calpine/Bechtel 1999b, p. 8.3-20).

Coyote Ranch, an NRHP eligible site is located approximately ½ mile from the proposed MEC project site. The City of San Jose has raised questions concerning potential impacts to this site.

The Keesling black walnut trees are San Jose City heritage trees. They were originally planted in the early 1900s. These trees occur in the unpaved area between the UPRR tracks and the west side of Monterey Road from Capital Expressway to Gilroy (Calpine/Bechtel 2000b, p. 3-3).

POWER PLANT SITE AND IMMEDIATE LINEAR FACILITY ROUTES

The proposed MEC site is located in the Coyote Valley. Due to the presence of sheds, chicken coops and debris on the site, ground visibility at the proposed plant site was fair to poor during the survey. There was also evidence of fill and garbage dumping (Calpine/Bechtel 1999b, p. 8.3-21).

PRESENCE/ABSENCE TESTING

Basin Research conducted presence absence testing in August 1999. The testing focused on Area 1 (North), including the proposed location of the generation plant and support facilities. Area 2 (South) is basically the route of the proposed access road and probable utility corridor. Area 3 is defined as two discrete loci in the immediate vicinity of Fisher Creek. The presence absence testing consisted of 24 backhoe test units (BTU). The actual trenches averaged approximately 2 feet wide and 5-10 feet long by 6 feet deep (Calpine/Bechtel 1999k, Confidential Attachment CR-35 p. 21).

The backhoe trenching revealed only culturally sterile soil in Test Areas 1 and 2. In Test Area 3, backhoe trenching did not reveal any cultural materials, but the cultural

resources consultant stated that the area's proximity to Fisher Creek and the presence of minor surface cultural material warranted monitoring in this area.

PROPOSED NATURAL GAS LINE

The proposed natural gas line is identified in the AFC as segments 1,3, and 4. The route is approximately one mile long and the line would tie into a PG&E main pipeline east of Highway 101. Segment one is located at the eastern end of the alignment. Visibility was fair and there was evidence of activity by off road vehicles. The consultant to the applicant identified an unnaturally lumpy ground surface that appeared to indicate the presence of fill. Visibility was poor the along the route of Segment 3. There was heavy vegetation and evidence of rodent burrows. Along segment four, only railway fill was identified.

A gas metering station will be located immediately adjacent to PG&E's line 300A, just east of Malech Road and south of the county road that intersects Malech Road. The area of the metering station will be approximately 35 feet by 80 feet and that places it inside area previously surveyed for the natural gas line (Calpine/Bechtel 2000d, p.1).

MEC WATER SYSTEMS

In October 1999, the applicant provided Supplement A that identified a proposed water route identified as the South Bay Water Recycling (SBWR) route (Calpine/Bechtel 1999e, p. 1). Prior to the filing of Supplement A in August 1999, Robin McClintock of CH2MHill conducted a survey of portions of this route that had not been previously surveyed. Access to several undeveloped agricultural land parcels between Great Oaks and Highway 85 along Via Del Oro was not obtained. In addition, the surveyor was not able to obtain access to a portion of segment B-3 referred to as the "elbow." Previously recorded sites were not relocated during this survey and no new sites were identified. (Calpine/Bechtel 1999e, p. 3-4).

The proposed domestic water line from Well No.23 runs parallel to the UPRR tracks, approximately one mile northwest to the plant site. Fill associated with railroad activities obscured much of the native ground surface. During the survey, no cultural materials that appeared likely to be eligible for listing on the NRHP were observed by Robin McClintock of CH2MHill.

PROPOSED ACCESS ROAD

The proposed access road would be 0.25 mile in length and would cross the UPRR tracks and then run northwest to the plant site (Calpine/Bechtel 1999, Confidential Attachment CR-35, p.30). The area of the proposed access road was subjected to presence/absence testing (Area 2) and only culturally sterile soil was revealed.

ELECTRIC TRANSMISSION LINE

The applicant estimates that 200 feet of new 230kv transmission line would be necessary and no new power poles will be required (Calpine/Bechtel, 1999a, p. 2-1). The Electric Transmission Line lies within the area surveyed for the plant site.

NATIVE AMERICAN CONTACTS

In January, February, and March of 1999, the consultant to the applicant contacted the Native American Heritage Commission (NAHC). This contact with the NAHC, and an inquiry to the Northwest Information Center of the (CHRIS), failed to identify the location of any traditional Native American cultural properties in the project area. The applicant sent letters to representatives of the Native American community on March 22, 1999, but no responses were received (Calpine/Bechtel 1999a, p. 8.3-22); (Bard, personal communication January 28, 2000).

Staff obtained a list from the NAHC of representatives of the Native American community who wished to be notified regarding any construction-related disturbances in Santa Clara County. Twelve individuals or organizations identified on the list were sent a letter, dated February 9, 2000, inviting them to a meeting on February 15, 2000. Staff also telephoned every individual or organization on the list from the NAHC. Some telephone numbers were not in service. The meeting was an outreach effort on the part to the Energy Commission to specifically address the areas of Environmental Justice and Cultural Resources.

Four representatives of the Native American community (Ohlone/Costanoan) attended the meeting and one person, who was unable to attend, telephoned. All in attendance expressed concern over the archaeological sensitivity of the area. Several stated that they had acted as monitors at sites in the vicinity of the project where human remains were unearthed. They also expressed concern over the potential for discovering human remains in the vicinity of MEC (CEC 2000m).

SUMMARY OF PREVIOUSLY IDENTIFIED CULTURAL RESOURCES IN THE PROJECT VICINITY

Forty-four prehistoric and historic resources have previously been identified within one mile of the proposed MEC project site (Calpine/Bechtel 1999b, p. 8.4-11). Five of these cultural resources have been determined eligible to the NRHP. Some of the prehistoric sites have been identified as habitation sites and several have contained Native American burials. The age of some of the sites may date as far back as 10,000 years before present (b.p.). Cultural resource sites in the Coyote Valley are both numerous and important and signal a potential for additional undiscovered resources in the project vicinity, therefore, making this area archaeologically sensitive.

IMPACTS

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed MEC project has the potential to adversely affect both known and previously 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 after they have been collected, prepared, and studied by professional archaeologists.

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. Forty-four archaeological sites, features, or objects are known to be located within one mile of the proposed project. One of the NRHP eligible sites within one mile of the proposed project site appears to be one of the oldest sites in western California (Morrato 1984, p. 110). These sites include historic-era buildings. The presence of numerous sites indicates a high potential for previously unknown historic and prehistoric resources to be encountered and affected during project construction.

POWER PLANT SITE AND LAYDOWN AREA

Approximately 14 fenced acres for project facilities and an additional 6 acres for a laydown area, totaling 20 acres, are likely to be disturbed by the project (Calpine/Bechtel 1999a, p. 8.3-4). Excavations for project site foundations will be typically less than 5 feet. Excavations for the circulation water pump would extend to approximately 18 feet below the final surface grade (Calpine/Bechtel 1999h, p. 38).

A storm water retention basin would be constructed in the southwest corner of the project site outside the riparian corridor setback area. Construction of the basin would include a storm water drain pipe under the existing levee into Fischer Creek. The basin would be located within the project site. Construction of the drain would trigger Section 404 of the Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR Section 320 and 323). This Section will require the applicant to obtain a permit from the US Army Corps of Engineers (USACE) before construction occurs near wetlands areas (Calpine/Bechtel 2000b, p. 3-15; Calpine/Bechtel 2000b, Attachment BR-26R, p. 4-3).

The City of San Jose has noted that the NRHP eligible Coyote Ranch is located within ½ mile of the proposed project site. The City raised the question of possible

air quality impacts including the effects of steam vapor emissions/condensation on this cultural resource. According to the Application for Certification, oxides of nitrogen (NOx), precursor organic compounds (POC), sulfur dioxide (SO2), carbon monoxide (CO), fine particulate matter (PM10) and water vapor will be emitted by the MEC project during expected normal operations (Calpine/Bechtel 1999a, p. 8.1-44). These emissions may cause or contribute to impacts at the Coyote Ranch area. Staff is continuing to research this question and will provide an analysis in the Final Staff Assessment.

There are 44 previously recorded archaeological sites within one mile of MEC. Some of the sites contained Native American burials. CA-SCL-178 may be the oldest identified site in western California. Sites in the Coyote Valley area are both numerous and important, therefore, Coyote Valley archaeologically sensitive area. It is likely that erosion from Tulare Hill, immediately to the northeast, and sediment from flooding of Coyote or Fisher Creeks may have buried archaeological sites within the project area.

As described in the AFC, there are no previously recorded cultural resources sites present within the project site or laydown area. Preliminary surveys for the project identified two archaeological loci. Later, presence/absence testing (24 backhoe trenches) identified the north area of the project site and the area surrounding the proposed access road as culturally sterile. Although no resources were identified in the third area surveyed, because some minor surface material was previously identified in the southern portion of the project site (north of Blanchard Rd.), the applicant recommends archaeological monitoring in that portion of the site (Calpine/Bechtel 1999k, Confidential Attachment CR-35, p. 21).

The Keesling black walnut trees, located from Capitol Expressway to the MEC project site south of Metcalf Road and south of the MEC site to the town of Gilroy, were planted originally by Horace G. Keesling. The trees were designated as a point of historical interest by the State of California in 1980. They line the west side of Monterey Highway and would not be affected by the proposed project (Calpine/Bechtel 1998b, p. 8.3-20).

ELECTRICAL TRANSMISSION LINE

The electric transmission line would be approximately 200 feet long and would connect with an existing PG&E transmission line. Since the transmission line route is located within an area of the project where new transmission poles would not be necessary and backhoe trenching did not reveal any cultural resources in the area, no impact is anticipated (Calpine/Bechtel 1999k, Confidential Attachment CR-35 pp. 21-22).

NATURAL GAS PIPELINE

The proposed natural gas line would extend 5,250 feet from the plant site to PG&E's main natural gas pipeline. This line is designated in the AFC as Segment 1,3, and 4 (Calpine/Bechtel 1999a, p. 6-1). Earth disturbance necessary for construction of the pipeline would primarily involve a combination of trenching, boring, and horizontal directional drilling. Trenching would consist of digging a three

to seven foot wide trench to enclose a 16-inch pipe that would be buried at least 36 inches under the earth. The trench for the natural gas line would vary in depth from approximately 5 feet under existing roads to 8 feet adjacent to the railroad right-of way. The width of the trench would be 3 feet in existing roadways and up to 20 feet in open land (Calpine/Bechtel 1999h, p. 41). Boring would be used where it is necessary for the natural gas pipeline to cross under something such as a road or canal for a short distance. The boring process necessitates the digging of boring pits on each side of the crossing and then using an auger or ramming device to "jack" the pipe into place. Horizontal directional drilling is a more expensive method of spanning undercrossings. A pilot hole is drilled and then enlarged with a reaming device until the size is sufficient to accommodate the pipe. The boring pits required at each end of the bored and horizontally directionally drilled segments will be 5 feet to 10 feet deep and approximately 10 feet by 30 feet in area (Calpine/Bechtel 1999a, pp. 6-1to 6-5).

PG& E would own and operate a metering facility. The facility would measure the gas supply to MEC. The metering station would be approximately 35 feet by 80feet. (Calpine/Bechtel 1999a, p. 6-5), (Calpine/Bechtel 2000b, p. 2-1; Calpine/Bechtel 2000, p.1). Construction of the metering station would necessitate grading an area approximately 80 by 150 feet. Grading would also be necessary for construction of a very short (length not specified) access road which will extend from a county road located to the north of the proposed metering station (Calpine/Bechtel 2000d, p.1-2). It would be constructed at the point of interconnection with the proposed natural gas line and PG&E's Line 300A. Preparation of the site will involve grading an area approximately 80 feet by 150 feet and a short 20 foot wide access road (Calpine/Bechtel 2000d, p.1). The area of the proposed metering station is within the area surveyed for the natural gas line and it does not appear that any resources would be impacted.

Three cultural resources sites, two of them NRHP eligible, are located close to the proposed natural gas line and PG&E metering station. It does not appear that any of these resources would be impacted, however presence/absence testing and monitoring would be required to ensure there are no impacts to previously undiscovered buried cultural resources (Calpine/Bechtel 1999b, Fig8.3-4b). Prior to initiating boring activity under Highway 101 it will be necessary for the applicant to obtain an encroachment permit from CalTrans (Calpine/Bechtel 1999a, p. 8.3-34).

WATER LINES

The proposed SBWR route would extend approximately 10.2 miles primarily along paved city streets and through residential and commercial areas. The three pipelines which would extend from MEC on the south side of Fisher Creek to connect with the Santa Teresa Boulevard. Junction would be constructed using an open-cut trench method through this agricultural area (Calpine/Bechtel 1999e, p. 3-1).

The SBWR is primarily a modification of the Snell Avenue/Santa Teresa Boulevard Route that incorporates some of the segments that were part of the Union Pacific Railroad (UPRR) route previously identified in the AFC. The proposed SBWR begins at the intersection of Sylvandale and Senter roads north of the proposed

power plant site then follows a route approximately 10 miles long. More than one-third of the route extends through city streets. Segment B-3 of this proposed route would contain the water supply pipeline, the domestic water line, and the industrial waste water line. The necessary construction corridor for these three lines may be as wide as 66 feet (Calpine/Bechtel 1999e, p. 2-3). Previously recorded sites CA-SCL-249 and CA-SCL-250 appear to be directly in the path of the proposed route (Calpine/Bechtel 1999b, Confidential Figures 8.3-4a and 8.3-4b).

There are several areas on the SBWR route where access to land for a survey could not be obtained by the applicant's consultant. It is also likely that trenching for this line would exceed the depth of previously disturbed soil. According to Data Response set 3B, since these sites were first identified there has been considerable development in the area. CA-SCL-249 could not be relocated and CA-SCL 250 would not have qualified as eligible for listing in the NRHP, even when it was originally discovered. These sites were revisited after development and only a single chipped chert flake was found. Therefore impacts to previously unknown cultural resources are possible in this sensitive area, but impacts to known resources are not likely.

A domestic water line is planned that would extend from Well No. 23 approximately one mile southeast of the plant to the plant site. There are previously identified cultural resources in the vicinity of this line. The applicant has recommended monitoring in order to protect any previously unidentified cultural resources. (Calpine/Bechtel 1999b p. 8.3-22).

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 Advisory Council on Historic Preservation, for example, must be given an opportunity to comment on any federally-funded or permitted undertaking that could adversely affect such resources.

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, Section 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 these 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 PRC Section 21083.2.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC and in subsequent filings for the MEC project meet one or

more of the criteria for being an 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, Section 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, Section 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 MEC site is proposed in an area sensitive for cultural resources. There are nine proposed projects within a five mile radius of the MEC project site. There are four projects within a three mile radius, two of which are located within one mile of the MEC. All of these proposed developments would cause considerable earth disturbance in Coyote Valley. In addition to the four projects planned within a three-mile radius of MEC, two of these proposed projects are within one mile of the MEC location. The closest proposed development to MEC is the Coyote Valley Research Park (Cisco), consisting of office, research, development, and light assembly facilities (CEC 1999k). In addition to Cisco, a residential development of 131 single-family units on an approximately 142 acre site is proposed. The Coyote Valley Urban Reserve (CVUR) may eventually include 20,000 to 25,000 housing units. These projects are most likely to contribute to cumulative impacts in conjunction with MEC because there is a possibility that they might impact some of the same sites. The earth disturbance caused by these projects will be considerable.

Proposed developments such as the MEC power plant and its associated linear facilities in conjunction with other development projects would increase the amount of land exposed to public access and potential removal or damage to cultural resources. The combined effects of such development can accelerate the potential for continued disturbance of cultural resource sites and the loss of valuable scientific information. The level of cumulative impact will grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites.

The incremental effect of this project would be likely to contribute to a significant cumulative impact on cultural resources in the Coyote Valley. MEC and any development projects within the Coyote Valley vicinity are likely to impact previously known cultural resources or encounter and disturb previously unknown cultural resources. Because these projects would disturb so much earth and because they would be built in such close proximity to one another, there is a possibility that more

than one project could impact the same site. The process of determining the presence of significant cultural resources will continue into the construction phase of this project. The applicant can mitigate impacts to both undetermined and identified sites to less than significant by following the recommendations for monitoring and mitigation set forth in the proposed conditions of certification.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Metcalf 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

Prior to initiating excavations under Highway 101, the applicant would need to obtain an encroachment permit from CalTrans. Construction of a storm water drainage pipe that would extend under an existing levee would trigger the necessity to obtain an Army Corps of Engineers Section 404 Permit, and compliance with Section 106 of the National Historic Preservation Act will become necessary.

MITIGATION

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. Avoidance can be accomplished by the demarcation of boundaries of known cultural resources, and by fencing and directing construction equipment away from environmentally sensitive areas (Calpine/Bechtel 1999a, p. 8.3-24). Construction crews would be informed concerning the importance of cultural resources and the legal protections afforded them. Because this portion of Coyote Valley is particularly sensitive for cultural resources, the applicant recommends pre-construction and subsurface testing in several areas (Calpine/Bechtel 1999a, p. 8.3-25). Although the natural gas line was recommended for presence absence testing in the AFC, it was not included in the testing done in August 1999 (Calpine/Bechtel 1999k). Confidential Attachment CR-35 recommends monitoring for the southern portion of the project site. The AFC also states that monitoring may be recommended in other locations as needed.

The applicant also recommends Native American monitoring by a member of the Ohlone community, if archaeological remains are discovered during project construction.

The applicant recommends the following six point program:

- Preconstruction assessment and construction training
- Construction monitoring
- Site recording and evaluation
- Mitigation planning
- Curation
- Report of findings (Calpine/Bechtel 1999a, p. p. 8.3-26 to 8.3-29)

The applicant's consultant has also stated that emergency maintenance and repair could cause impacts to cultural resources.

The applicant's consultant has stated that in developing specific mitigation measures to address impacts for any site that cannot be avoided through redesign during construction, the potential for ongoing impacts to that resource must be considered. Any mitigative data recovery should be properly scoped, in conjunction

with the appropriate agencies, to address potential long-term ongoing impacts (Calpine/Bechtel 1999a, pp. 8.3-28).

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the AFC and in supplemental 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 Santa Clara and the City of San Jose. 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.

Staff proposes presence/absence testing along the proposed route for the natural gas line and in the area of the PG&E metering station to ensure that there are no unmitigated impacts to previously undiscovered resources in this archaeologically sensitive area. As reflected in the conditions of certification, staff also proposes monitoring during earth disturbance in the vicinity of the project site and laydown area. Moreover, monitoring should occur along the SBWR route, the line to Well No. 23, and the natural gas line route, including the PG&E metering station (if presence/absence testing reveals evidence or cultural resources). Human remains were present in several previously excavated sites within one mile of the project. Due to the potential for encountering human remains in the project vicinity, staff proposes that a Native American monitor (Ohlone/Costanoan) be part of the cultural resources team and be present during cultural resources monitoring activities.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

There are a total of 44 recorded and recently identified cultural resource sites within one mile of the proposed MEC project. Six of these sites have been determined eligible to the NRHP and by inference to the CRHR. 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 Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

PROPOSED CONDITIONS OF CERTIFICATION

Between the Preliminary Staff Assessment and Final Staff Assessment, staff is going to be looking at its proposed conditions to appropriately reflect pre-construction activities.

CUL-1 Prior to the start of any construction-related vegetation clearance or earth disturbing activities, or project site preparation, the project owner shall provide the California Energy Commission (Commission) Compliance Project Manager (CPM) with the name and statement of qualifications of its designated cultural resource specialist who will be responsible for implementation of all cultural resources Conditions of Certification.

Protocol: The statement of qualifications for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meet the minimum qualifications set forth below, including the 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 designated cultural resource specialist 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.

Verification: At least ninety (90) days prior to the start of project earth disturbing activities, the project owner shall submit the name and statement of qualifications of its designated cultural resource specialist 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 any construction related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall confirm in writing to the CPM that the approved designated cultural resource specialist 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 designated cultural resource specialist, 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 designated cultural resource specialist.

CUL-2 Prior to the start of any construction-related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings issued for the final construction site plan and site layout, and for the final alignment of all linear facilities. The routes for the linear facilities shall be provided on 7.5-minute quad maps, showing:

post mile markers (including for tenths of a mile);

final center lines and right-of-way boundaries; and

the location of all of the various areas where surface or subsurface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, and any other project components.

The designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps, presented as a sequence of strip maps (or other acceptable format approved by the designated specialist) for the linear facility routes. The strip maps would include post mile and tenth of a mile marks and show the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of potential ground disturbance associated with the construction and maintenance of project-related linear facilities. The project owner shall also provide copies of any such enlargements to the CPM at the same time as they are provided to the specialist.

Verification: At least seventy-five (75) days prior to the start of vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings issued for the final construction and site plan and site layout, and for the final alignment of all linear facilities. The routes for linear facilities shall be provided on 7.5-minute quad maps. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall also provide a set of these maps to the CPM at the same time that they are provided to the specialist.

CUL- 3 Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; 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 construction-related vegetation clearance or earth disturbing activities or project site preparation.

Protocol: The Cultural Resources Monitoring and Mitigation Plan 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 designated cultural resource specialist. 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, however monitoring shall be conducted full time in the specified areas that follow. Monitoring shall be conducted full time on the project site and laydown area (excluding presence/absence testing Areas 1 and 2). It shall also be conducted full time on the South Bay Water Recycling (SBWR) route and the route to Well No. 23

(wherever earth-disturbing activity is taking place) and along the natural gas line (wherever monitoring is warranted by information acquired by presence/absence testing).

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.

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.

Verification: At least sixty (60) days prior to the start of project construction related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-4 Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation, the designated cultural resource specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

Protocol: 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 designated cultural resource specialist 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.

Verification: At least sixty (60) days prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; 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 construction-related vegetation clearance or earth disturbing activities or project site preparation; 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.

Verification: Within seven (7) days after the start of project related vegetation clearance or earth disturbing activities or project site preparation, 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 designated cultural resource specialist or the specialist's delegated monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project construction related vegetation clearance or earth disturbing activities or project site preparation.

If such resources are found and the specialist determines that they are not significant, the specialist may allow construction to resume. The project owner shall notify the CPM of the find as set forth in the Verification.

If such resources are found and the specialist determines that they are or may be significant, the halting or redirection of construction shall remain in effect until:

the designated cultural resource 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 designated cultural resources 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 designated cultural resource 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.

Verification: Thirty (30) days prior to the start of project construction-related vegetation clearance or earth disturbing activities and preparation; the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find.

For any cultural resource encountered that the specialist determines is or may be significant, the project owner shall notify the CPM within 24 hours after the find.

For any cultural resource encountered that the specialist determines is not significant, the project owner shall notify the CPM within 72 hours after the find.

CUL-7 Prior to the start of project construction related vegetation clearance or earth disturbing activities or project site preparation; and each week throughout project construction, the project owner shall provide the designated cultural resource specialist 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 designated cultural resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: Ten (10) days prior to the start of project construction- related vegetation clearance or earth disturbing activities or project site preparation; 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 designated cultural resource specialist and delegated 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 delegated monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout the project construction period, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the designated cultural resource specialist and delegated monitor(s) are available for periodic audit by the CPM. Upon request by the CPM, the project owner shall provide specified weekly summary reports to the CPM.

CUL-9 Except in the areas specified in CUL-3(f), the designated cultural resource specialist or delegated monitor(s) shall be present at times the specialist deems appropriate to monitor construction-related ground disturbance, including grading, excavation, trenching, and/or auguring, in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified.

Protocol: Except as specified in CUL-3(f), if the designated cultural 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 and the CPM of the changes. The designated cultural resource specialist 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.

Verification: 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 designated cultural resource specialist regarding project-related cultural resource monitoring.

CUL-10 The project owner shall obtain ground disturbance or cultural resource excavation permits from Caltrans and/or the U.S. Army Corps of Engineers, as necessary. If cultural resources are unearthed in an area covered by the Corps of Engineers permit, the project owner shall consult with that agency and the CPM regarding compliance with Section 106 of the National Historic Preservation Act.

Verification: The project owner shall submit a copy of any permit addressing data recovery excavation from Caltrans and/or the Corps of Engineers 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 designated cultural resource specialist 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.

Verification: 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 Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

a. a discussion of any analysis to be conducted on recovered cultural resource materials;

b. discussion of possible results and findings;

c. proposed research questions which may be answered or raised by analysis of the data recovered from the project; and

d. an estimate of the time needed to complete the analysis of recovered cultural resource materials and to prepare the Cultural Resources Report.

Verification: 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. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report 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.

Verification: The project owner shall ensure that the designated cultural resource specialist completes the Cultural Resources Report 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 Cultural Resources Report 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.

Protocol: 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 mitigtion 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.

Verification: Within thirty (30) days after receiving approval of the Cultural Resources Report, 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), and the City of San Jose, to a person authorized to receive confidential cultural resources information.

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 Cultural Resources Report 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.

Verification: 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 Prior to the start of any construction-related vegetation clearance or earth disturbing activities, project site preparation or presence absence testing required in these conditions, the project owner and the designated cultural resources specialist shall consult with Ohlone/Costanoan 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.

Verification: At least thirty (30) days prior to the start of project-related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the CPM with a copy of all finalized agreements for Native American (Ohlone/Costanoan) 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.

CUL-17 Prior to any project related ground disturbance, including grading, trenching, boring, digging pits or horizontal directional drilling in the vicinity of the natural gas pipeline route or PG& E metering station, presence/absence testing shall be conducted.

Verification: Reports addressing the results of the presence/absence testing shall be included in the Monthly Compliance Report.

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SOCIOECONOMICS

James Adams

INTRODUCTION

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 and facility closure. This analysis discusses the potential direct and cumulative impacts of the proposed Metcalf Energy Center (MEC) project on local communities, community resources, and public services.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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

Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.

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

SANTA CLARA COUNTY GENERAL PLAN

The General Plan encourages increased economic development planning and promotion consistent with the economic well-being of Santa Clara County. Relevant policies include:

C-EC-9

"Coordinated countywide economic development planning and promotion efforts should be increased."

C-EC-10

"The County shall play a leadership role in encouraging and facilitating coordinated countywide economic development planning."

CITY OF SAN JOSE 2020 GENERAL PLAN

The basic economic goal is to create a stronger municipal tax base by obtaining a greater share of the total industrial and commercial development in the County, and by nurturing and encouraging expansion of the existing industrial and commercial development in the City of San Jose.

Economic Goal #7 states that the City encourages a mix of land uses which contribute to a balanced economic base, including industrial suppliers and services, "green industries," as well as high technology manufacturers and other related industries.

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA PLAN

This Plan expresses the need for development to bear the costs of any necessary extensions or expansions of public infrastructure. It serves as a guideline for all public agencies and future developers who will participate in the building of the North Coyote Campus Industrial community.

SETTING

PROJECT LOCATION

The proposed MEC would be located at the southern base of Tulare Hill at the northern end of Coyote Valley in South San Jose just west of Monterey Highway and south of the Metcalf road intersection. 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 Metcalf Application for Certification (AFC), Vol. 1 (Calpine/Bechtel, 1999a). The study area (affected area), as defined in the socioeconomics section of the AFC, includes the San Jose Metropolitan Statistical Area (MSA) and the City of San Jose. There are a variety of communities within this area such as Campbell, Cupertino, Gilroy, Los Altos, Milpitas, Morgan Hill, Mountain View, Palo Alto, Santa Clara, Saratoga, and Sunnyvale. The population of Santa

Clara County in 1997 was estimated to be 1.6 million, which is a 9 percent increase from 1990 (U.S. Census Bureau 1999). Staff expects that the City of San Jose and Santa Clara County will receive the majority of the socioeconomic impacts generated by the project.

DEMOGRAPHICS

The 1990 U.S. Census estimated the population of Santa Clara County at approximately 1.5 million. Of this amount, 58 percent were white and 42 percent were minority (Black, American Indian, Eskimo, Aleut, Asian or Pacific Islander, Hispanic, or other). For the south San Jose area within six miles of the proposed MEC, the 1990 U.S. Census shows that minorities comprised about 38 percent of the population (See **Socieconomics Table 1**). This percentage is estimated to have increased to 49 percent in 1999 according to projections based on the 1990 Census data by the marketing firm of Claritas (Claritas 2000). Because the Claritas data is an estimate based on the 1990 Census, staff considers the 1990 data most reliable.

The demographic profile displayed in **Socioeconomics Table 2** shows the white and minority populations in census tracks within a six-mile radius of the proposed MEC site using the 1999 population estimate from Claritas. There are four census tracts adjacent to or near the MEC that have a minority population of more than 50 percent. Two of these tracts are sparsely populated agricultural areas both northeast and south of the project site. The other two are located west and north of the MEC.

Socioeconomics Table 3 indicates that approximately five percent of the people living within six miles of the MEC are low-income.

SOCIOECONOMICS Table 1
Demographic Profile For Census Tracts Within Six Miles of the MEC Site

Census Tract	White	Minority *	Total Population In Census Tract	Percent Minority In Census Tract
512798	690	221	911	24
512100	921	982	1903	52
512298	2503	598	3101	19
511911	2326	756	3082	25
512012	5229	2294	7523	30
512032	2230	1439	3669	39
512033	4032	1576	5608	28
512031	3502	1158	4660	25
512030	2472	818	3290	25
512028	3540	1679	5219	32
512014	4394	1666	6060	27
511909	4207	1737	5944	29
511912	3714	1344	5058	26
512029	5014	1921	6935	28
512023	2840	2504	5344	47
512022	2600	1005	3605	28
512018	2704	4155	6859	61
512017	2850	3642	6492	56
512021	3695	2206	5901	37
503208	1060	2777	3837	72
512097	1629	1788	3417	52
503318	3401	4172	7573	55
503320	4744	1272	6016	21
503319	1365	2293	5647	41
512098	3354	2293	5647	41
Totals	**75,016**	**45,451**	**120,467**	**38**

***** Hispanic Origin, Black, American Indian, Asian Pacific Islander, Other
Source: 1990 US Census Data, Statistical Information on Population

SOCIOECONOMICS Table 2
Demographic Profile For Census Tracts Within Six Miles of the MEC Site

Census Tract	White	Minority *	Total Population In Census Tract	Percent Minority In Census Tract
512798	631	276	907	30
512100	730	1312	2042	64
512298	2310	938	3284	29
511911	2724	1128	3852	29
512012	4995	3169	8164	39
512032	1848	2118	3966	53
512033	4070	2068	6138	34
512031	3469	1542	5011	31
512030	2541	1045	3595	29
512028	3312	2322	5634	41
512014	4095	2415	6510	37
511909	4346	2513	6859	37
511912	3707	1674	5381	31
512029	4886	2625	7511	35
512023	2038	3638	5676	64
512022	2706	1473	4179	35
512018	1635	5930	7565	78
512017	2367	4951	7318	68
512021	3368	2892	6260	46
503208	594	3596	4190	86
512097	1924	3048	4972	61
503318	3677	6776	10453	65
503320	5136	1861	6997	27
503319	1941	3448	5389	64
512098	3163	3036	6199	49
Totals	**74,612**	**68,502**	**140,715**	**49**

***** Hispanic Origin, Black, American Indian, Asian Pacific Islander, Other
Source: Claritas. Race and Hispanic Origin Population Estimates for 1999

SOCIOECONOMICS Table 3
Number of Persons Living Below Poverty Level Within Six Miles of the MEC Site

Census Tract	Number of Persons in Tract	Persons Below Poverty Level	Percent Below Poverty Level
512798	911	101	11
5121	1903	160	8
512298	3101	122	4
511911	3082	132	4
512012	7523	346	5
512032	3669	155	4
512033	5688	293	5
512031	4660	83	2
512030	3290	90	3
512028	5219	403	8
512014	5820	185	3
511909	5944	90	1
511912	5058	136	3
512029	6935	124	2
512023	5399	522	10
512022	3605	124	3
512018	6859	1021	15
512017	6492	582	9
512021	5901	129	2
503028	3837	230	6
512097	3417	186	5
503318	7573	364	5
50032	6016	81	1
Totals	**111602**	**5659**	**5**

Source: 1990 US Census Data, Statistical Information on Population

EMPLOYMENT

Employment in Santa Clara County in 1999 was estimated at 933,500 with approximately 3 percent of the available workforce unemployed. The largest sectors of employment were manufacturing, trade, services, state and local government, and construction respectively (CDF, 1999). An April 14, 2000 press release by EDD noted that employment in Santa Clara County increased 2.1 percent from March 1999 to March 2000. The largest gains were in business services and amusements.

FINANCIAL

The San Jose/Santa Clara County area ranks as one of the strongest economies in the country with a reputation as a world class manufacturing community with a highly productive labor force. Santa Clara County ranks first among all nine Bay Area counties in new construction ($3.2 billion in 1998), total retail sales ($19.2 billion in 1998), total net effective buying income ($39.6 billion in 1998), and total manufacturing employment (246,003 in 1997). San Jose ranks third in the nation in median household effective buying income of $54,144 in 1998, and Silicon Valley is considered the single most important high-tech center in the U.S. (San Jose Chamber of Commerce 1999).

HOUSING

As of January 1, 1999, there were a total of 581,532 housing units in Santa Clara County, with about 4 percent vacant (CDF 1999). Housing construction is lagging behind job growth, which forces workers to live quite far from the San Jose area and commute long distances to work (ABAG 1999). It is estimated that by 2020, the San Jose MSA will produce 50 percent more jobs while housing will increase by only 20 percent (ABAG 2000).

SCHOOLS

The MEC site is located in the Morgan Hill Unified School District and is adjacent to the Oak Grove School District/ East Side Union High School District. Staff has determined that the Morgan Hill Unified School District currently exceeds the District's planned capacity. There are plans to construct an elementary and high school to accommodate additional students. Construction should begin in 2001 (Pasillas 2000).

UTILITIES, EMERGENCY AND OTHER SERVICES

San Jose receives gas and electricity from Pacific Gas & Electric. Water is supplied by the South Bay Water Recycling Program and the San Jose Municipal Water System). Sewer services for the proposed MEC site is provided by the City of San Jose (Rosenbloom 1999). Fire protection services are provided by the San Jose Fire Department and the South Santa Clara County Fire District (Buzzetta 1999). The primary responder for emergency calls is the Santa Clara County Sheriff's Department, though the San Jose Police Department is available for backup or initial response as needed (Hirokawa 1999).

The nearest hospital to the MEC site is the Santa Theresa Kaiser Permanente Medical Center located less than four miles to the northwest. It is a 336-bed hospital that can provide a wide variety of services to area members. There are over a dozen other hospitals in Santa Clara County including four facilities in San Jose. All hospitals coordinate response to large-scale emergencies and ambulance services are available from every hospital. With the exception of the flu season, bed and service capacity is available throughout the year (Kelsey 2000).

IMPACTS

PROJECT-SPECIFIC IMPACTS

Staff reviewed the MEC AFC, Vol. I, July 1999, Socioeconomic Section 8.8, and subsequent revisions regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and environmental justice. In addition, staff reviewed the relevant supplemental filings outlined in Calpine/Bechtel Status Report #5 dated February 16, 2000. The applicant used appropriate public databases (e.g. EDD, U.S. Census Bureau) in the analysis in the AFC. Staff's analysis is based on verification of the information within the AFC and independent research as discussed below, Staff finds the AFC's socioeconomic analysis and conclusions to be acceptable.

EMPLOYMENT

Calpine/ Bechtel anticipate that the workforce in the San Francisco Bay area will adequately fulfill the labor requirements for Metcalf. The construction of the facility will take 18 to 20 months and the personnel required will peak at 399 workers during month 16 of the construction period. There will be a gradual increase in workers from the first months of construction and a gradual decrease in the last months of construction. There will be over 100 workers on site during approximately 11 months of the construction period. Approximately 20 personnel will be employed throughout the facility's operation. Tables 8.8-5 through 8.8-11 in the socioeconomic section of the AFC display information on employment distribution, the types of personnel for construction by month, available labor by skill in Santa Clara County, and plant operations work force. These numbers are consistent with other power plant projects.

The California Employment Development Department and local labor officials agree that the number of skilled and manual laborers in the San Francisco Bay area is adequate to meet the construction needs (EDD 1999). Consequently, staff estimates that almost all of the construction labor force will commute daily to the job site from their homes in area communities. During the operational life of Metcalf, staff anticipates that the employees will commute from within Santa Clara or adjacent counties. In general, full-time jobs have a multiplier effect on the local and regional economy by supporting additional indirect job growth. It is estimated that two to three indirect jobs are supported by each construction job, such as those that would be generated at the MEC.

HOUSING

The demand for housing in the project area is not expected to increase appreciably as a result of the MEC because the vast majority of the work force are expected to commute from the San Francisco Bay area and adjacent counties. Those workers who live a long distance (more than a two-hour drive) could temporarily relocate in the San Jose area. Temporary housing opportunities such as motels and short-term rentals of housing are available. There are approximately 113 hotels and motels with about 10,000 rooms available in the greater San Jose area with a vacancy rate of approximately 17 percent (Bradley 2000). There are also recreational vehicle parks and KOA Kampground facilities in Santa Clara and adjacent counties (Millard 2000). For example, the Maple Leaf RV Parkin Morgan Hill has 270 full hook-up spaces (Yoders 2000).

SCHOOLS

Industrial development within the Morgan Hill Unified School District is currently charged a one-time assessment fee of $0.31 per square foot of principal building area. At this rate, the fee for Metcalf will be about $8,587. Because almost all of the construction workforce is expected to commute from homes in the area where their children are already attending schools, no significant impacts is expected on the Morgan Hill or Oak Grove School Districts. Operation employees are expected to be drawn from the local workforce in Santa Clara County and therefore, no significant impact is expected on Morgan Hill or Oak Grove school districts.

UTILITIES, EMERGENCY AND OTHER SERVICES

The South Bay Water Recycling Program (SBWR) will be the primary source of cooling water for the MEC. It is estimated that the MEC would require approximately 5 million gallons of water per day at peak flow. Potable water will be required for non-cooling industrial processes and domestic uses. Calpine/Bechtel are also proposing to use potable water resources for back-up supplies in the event that recycled water is not available. Two water purveyors are being considered to supply water resources to the MEC: San Jose MUNI and Great Oaks Water Company. Both of these retailers have indicated that additional infrastructure (wells and pipelines) will be needed to serve the MEC. The applicant will hook up to the San Jose sewer system to dispose of all wastewater. For more discussion on water resources issues, please see the **Water Resources** section of this PSA.

PG&E will provide electricity during construction from the Metcalf substation which is near the plant site, and natural gas will be acquired from a major PG&E gas line within 200 feet east of Highway 101.

The City of San Jose's General Plan states that "New development is expected to pay for the infrastructure required to support it (San Jose 2020 General Plan 1994)". This is also consistent with the North Coyote Valley Campus Industrial Area Plan which requires developers to bear the cost of any extensions or expansions of public infrastructure. Staff understands that the City of San Jose and the applicant are negotiating the fair share amount that the applicant will pay for the waterlines needed for the project. This will be updated in the FSA. The MEC is consistent

with the City of San Jose's 2020 General Plan which encourages the expansion of the existing industrial and commercial sector of the local economy.

Based on a personal communication with a member of the San Jose Fire Department, staff has identified that current resources are inadequate to handle potential impacts or emergencies from the MEC (Buzzetta 1999). Specifically, the response time to an emergency call is already longer than fire regulations require. The hazardous materials team is located in the northern part of San Jose and could be delayed by traffic if called on to respond to an emergency at the MEC. In addition, projected economic development, including the MEC, requires a new fire station in the Northern Coyote Valley.

These concerns were noted in a letter from the San Jose Planning Department that outlined the need for a new fire station and staffing for a minimum of one engine and truck company (Derryberry 1999). Given expected additional development throughout the San Jose area, the Planning Department and the San Jose Fire Department are developing a strategy to meet fire protection needs for the foreseeable future (Prevolti 2000). Discussions are ongoing regarding the MEC's fair share for these additional resources and their status will be updated in the Final Staff Assessment.

Based on personal communication with representatives of the Sheriff's Department and the San Jose Medical Center, staff believes that the MEC will not adversely affect police or hospital services (Hirokawa 1999, Kelsey 2000).

FINANCIAL

The applicant estimates that the construction payroll will be $40.8 million (1999 dollars) for 18-20 months, and the operation payroll will be $1 million annually, the bulk of which will be spent in the affected area communities (AFC P.8.8-9). The applicant estimates that $5 to $10 million worth of materials and equipment will be purchased locally during construction. This spending will generate 8.25 percent sales tax revenues for Santa Clara County. This is divided up as follows: 6 percent goes to the state, 1 percent goes to the place of sale, 0.25 percent goes to the county transportation authority, 0.5 percent goes to the county transit district, 0.5 percent goes to the county general fund (AFC P. 8.8-15). The annual operations budget will be $2 to $4 million and there will be an annual maintenance budget of $10 to $15 million. If the facility is assessed at between $300 and $400 million, the total property tax obligation will range from $3 to $5.2 million annually (See **Socioeconomics Table 3**). The MEC will have a relatively small but positive financial impact on the San Jose area.

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 potentially affected community has a population that is more than 50 percent minority and/or low-income; and

- Whether the 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, staff contacts local community groups to provide the Commission with a fuller understanding of the community and the potential environmental justice issues. In addition, community groups are asked to help identify potential mitigation measures.

Staff has determined the affected area for this environmental justice analysis to be the area within a six-mile radius of the proposed project site. The affected area is defined as the area potentially impacted by the proposed project (primarily for air quality and public health). **Socioeconomics Figure 1** shows census tracts within the six-mile radius that had a minority population of more than 50 percent as estimated by the 1999 Claritas data. **Socieconomics Figure 2** depicts the same census tracts using the 1990 census data.

Staff contacted members of the Hispanic, Asian and Afro-American communities to inform them about the MEC and the Commission siting process. A community meeting was held on March 14, 2000, where the staff and Commission's Public Adviser provided materials in English and Spanish, discussed the project and the power plant siting process, and answered questions. One of the community members served as a Spanish interpreter. A second community meeting with the Asian community is planned for later this spring.

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 use the same greater than 50 percent threshold that is used for minority populations. The low-income population, at five percent in the MEC area, is significantly below this threshold; therefore there is no low-income environmental justice issue.

As noted under Setting above, the census tracts adjacent to or near the MEC that have a minority population greater than 50 percent are sparsely populated agricultural areas. Due to insufficient air quality data, staff is unable, at this time, to determine if there could be a disproportionately high and adverse effect on the minority populations in the census tracts identified as having greater than 50 percent minority. This analysis will be provided in the Final Staff Assessment.

PROPERTY VALUES

In general, the project area is experiencing significant growth which is amplifying a housing shortage and causing the average price of a home to increase. A number of residents in the Tulare Hill area have expressed concerns about the project's impact on property values. The concern is that those individuals who decide to sell their homes or businesses will not be able to get full market value once the power plant is built and operating. Because staff has encountered this view in previous siting cases (Crockett, San Francisco, Sutter), staff requested the applicant to perform a property values analysis that included: 1) a study of possible effects on

property values in neighborhoods in proximity to the proposed MEC (Supplement SO-7A), 2) a review of the literature on property value impacts from industrial activities (Supplement SO-7B), and 3) an analysis of housing price and sales trends for neighborhoods in proximity to the proposed MEC (Supplement SO-7C).

A consultant was hired by staff to review the applicant's supplemental analyses, conduct a review of the literature on property value impacts from industrial activities, and summarize the findings (Troy 1999). In general, 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. Further, the housing market is extremely tight in the San Jose /Santa Clara area because of an imbalance between housing supply and demand. This has led to an increase in the median home price of over 20 percent from 1998 to 1999 in this area (ABAG 1999). Property values in this area are expected to continue to increase in the foreseeable future.

CUMULATIVE IMPACT

Staff has identified a variety of projects that are undergoing or will undergo CEQA review of their applications. These include the Coyote Valley Research Park (CISCO), a 688 acre project that will include office, research and development, and light assembly buildings that will employ approximately 20,000 employees upon full buildout. The site is about one-quarter mile south of the MEC site. Construction is expected to start in the summer of 2000. A residential development, expected to be located approximately one mile northeast of MEC, would involve building 131 single-family homes on 28 acres. The EIR for the project has not been completed.

There are several other projects planned for areas within three-to-four miles of MEC. The Coyote Valley Urban Reserve is located two miles south and would contain as many as 25,000 homes, but the development is considered long-term in nature. The Hellyer View I project involves a 400,000 sq. ft. manufacturing, research, development, and warehousing facility about four miles north of MEC. A decision on a site development plan is pending. Another manufacturing, research and development facility called Creekside Plaza is planned for an area four miles north of the MEC. This project is also waiting to receive a site development permit.

Construction of some of these projects will likely overlap with construction of the MEC should it be approved. In addition, they may be an overlap with Calpine's other power plant projects in the Pittsburg and Antioch area. The only potential impact from a cumulative socioeconomic point of view would be a possible shortage of workers in some trades. However, because of the large available work force in the San Jose/San Francisco Bay area and adjacent counties, staff believes that there are an adequate number of workers in the area. The 20 operation workers needed for the MEC will have an insignificant contribution to a cumulative socioeconomic impact when compared to the projected 20,000 employees for the CVRP at full buildout.

Workers commuting from other communities in Santa Clara and neighboring counties to the South San Jose area will minimize the impacts on housing and local

services. Housing, medical services and schools will not be adversely impacted. Assuming that the deliberations between the applicant, the City Planning Department, and the fire district are resolved satisfactorily to all parties, fire protection services to the South San Jose area in general will not be adversely affected by the addition of the MEC and other development. Property tax revenues from the all these projects will benefit school, fire and other districts in the San Jose area as depicted in **Socioeconomics Table 4**.

In summary, staff believes that the construction and operation of the MEC, along with the development of other projects in the vicinity will not add significantly to the cumulative socioeconomic impacts on the local area. However, the full buildout of the CISCO project will have a significant socioeconomic affect on the south San Jose area.

FACILITY CLOSURE

UNEXPECTED PERMANENT CLOSURE

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. The MEC AFC (PP. 4-1 and 4-2) describes what will happen if the plant is shutdown or closed prematurely. The planned lifetime 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, the City of San Jose, and 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.

Socioeconomics Table 4
Estimated Property Tax Distribution for Metcalf Energy Center

Taxing Jurisdictions	Approximate Post ERAF Share of Tax Increment	Estimated Revenue at $3 Million/Year in Property Taxes	Estimated Revenue at $5 Million/Year in Property Taxes
County General	13.2%t	$398,868	$664,781
County Library	2.46%	$74,097	$123,495
Morgan Hill Unified School District	46.29%	$1,388,833	$2,314,722
Gavilan Community College	5.88%	$176,538	$294,230
County School Service	0.48%	$14,664	$24,440
County Office of Education	3.05%	$91,756	$152,926
South Santa Clara County Fire	10.07%	$321,000	$556,400
Santa Clara Valley Water District East 1	1.6%	$48,197	$80,328
Santa Clara Valley water District	0.15%	$4,675	$7,791
Bay Area Air Quality Management District	0.17%	$5,261	$8,769
Guadalupe-Coyote Resource Conservation District	0.04%	$1,200	$2,080
Santa Clara Valley Water District Zone W-3	0.09%	$28,485	$47,442
SCVWD Stae Water Project	0.46%	$13,908	$23,180
Educational Revenue Augmentation Fund	13.88%	$416,483	$694,138
TOTALS	**100.00%**	**$3,043,965**	**$4,994,722**

Source: Adapted From Data from Wendy Beetle, Tax Assessor, Santa Clara County

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MITIGATION

Energy Commission staff has identified economic and fiscal benefits to the project area 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. A condition is proposed to ensure that the project owner pays the Morgan Hill Unified School District a one-time assessment fee of $8,587.

The San Jose Fire District requires additional equipment and staff to adequately serve the fire protection and emergency rescue needs of the MEC and other anticipated South San Jose development. Staff has proposed a condition requiring the applicant to establish an agreement with the City of San Jose and the San Jose Fire district to pay a fair share of the cost for the needed equipment and staff.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff believes that the MEC would not cause a significant adverse direct or cumulative impact on housing, employment, schools, public services or utilities. An agreement between the applicant, the San Jose Fire Department, and the City of San Jose is needed to address the need for additional fire protection services for the MEC and other proposed development projects. The MEC would have a temporary benefit to the City of San Jose and adjacent areas in terms of an increase in local jobs and commercial activity during the construction and operation of the facility. The construction payroll and project expenditures would also have a positive effect on the local and county 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 budget will be $2 to $4 million. Overall, staff believes that the project will have a positive socioeconomic impact on the San Jose area.

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 Morgan Hill Unified School District. In addition, the conditions create a mechanism for acquiring fire department equipment and staff to be funded through a fair share agreement.

RECOMMENDATIONS

If the Energy Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within the City of San Jose and Santa Clara County 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 San Jose Building Department.

The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

SOCIO-3 Prior to the start of earth moving activities, the project owner shall reach agreement with City of San Jose and the San Jose Fire District on the amount and timing of funds the project owner will provide to cover a fair share of the costs for additional facilities, equipment and staffing needed to improve fire protection services in the South San Jose area.

Verification: At least sixty (60) days prior to the start of earth moving activities, the project owner shall submit to the CPM a copy of the agreement with the City of San Jose and the San Jose Fire District which states the amount and timing of funds the project owner will provide to pay for the fire protection costs described above.

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BIOLOGICAL RESOURCES

Linda Spiegel

INTRODUCTION

This section provides the Energy Commission preliminary staff analysis (PSA) of potential impacts to biological resources from the construction and operation of the Metcalf Energy Center (MEC) proposed by Calpine Corporation and Bechtel Enterprises, Inc. This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern; describes the biological resources of the project site and at the locations of appurtenant facilities; determines the need for mitigation and 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 Calpine/Bechtel's Application for Certification (AFC) (Calpine/Bechtel 1999a), Supplemental Filings (Calpine/Bechtel 1999b, 2000a), site visits, workshops, staff data requests and applicant responses (Calpine/Bechtel 1999cdef, 2000bcd), a Biological Assessment (Calpine/Bechtel 2000d), and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 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, sections 703 - 712, prohibits the take of migratory birds.

CLEAN WATER ACT

33 USC, section 404 et seq, prohibits the discharge of dredged or fill material into the waters of the United States without a permit. Nationwide permit (NWP) 7 is required to construct an outfall structure where the effluent is authorized under the National Pollution Discharge Elimination System program (Section 402).

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 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 section 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 sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 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 section 1600 et seq. requires 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 section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

SANTA CLARA COUNTY GENERAL PLAN

Policy R-RC19 requests that habitat types and biodiversity be maintained and enhcnced. Policy R-RC 24 requests that areas of particularly fragile ecological nature or necessary for preserving threatened or endangered species receive special consideration for preservation and protection from development impacts.

SANTA CLARA COUNTY TREE ORDINANCE

NS-1203.107, Sec. C16-2(c) and (j) an Sec C16-3 defines Heritage and ordinance trees and prohibits removal without a permit.

CITY OF SAN JOSE 2020 GENERAL PLAN

WOODLANDS, GRASSLANDS, CHAPARRAL AND SCRUB POLICIES

Number 8: Serpentine grasslands should be preserved and protected to greatest extent feasible or appropriate measures should be taken to restore or compensate.

BAY AND BAYLANDS POLICIES

Number 5: The City should continue to participate in the Santa Clara Valley Non-Point Source Pollution Control Program and meet regional water quality standards implemented through the National Pollution discharge Elimination System Permits.

SPECIES OF CONCERN POLICIES:

Number 1: Consideration should be given to setting aside conservation areas in the Bay and baylands, along riparian corridors, upland wetlands, and hillside areas to protect habitats of unique, threatened and endangered species.

Number 2: Habitats that support Species of Concern should be retained to the greatest extent feasible.

URBAN FOREST POLICIES:

Number 2: Development projects should include the preservation of ordinance-sized trees, and other significant trees.

Number 8: Where urban development occurs adjacent to natural plant communities (e.g. riparian forest), landscape plantings should incorporate tree species native to the area to the greatest extent feasible.

CITY OF SAN JOSE RIPARIAN CORRIDOR POLICY

GUIDELINE 1C: SETBACK AREAS

All buildings, other structures, impervious surfaces, outdoor activity areas and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank , whichever is greater).

GUIDELINE 2C: VISUAL AND GUIDELINE 2E: LIGHTING

Development projects should be designed to minimize potential impacts to adjacent riparian habitat through the use of environmentally sensitive construction materials/activities, specialized lighting features and native landscaping.

GUIDELINE 6B: VEGETATION REMOVAL

Vegetation removal in riparian areas should be performed only for floodway maintenance or to remove undesirable exotic plants. Herbicides should only be used where manual and mechanical methods are infeasible. If vegetation removal is required as a part of project design, tree removal should be reviewed with the City Arborist. A 3:1 habitat replacement ratio is required and revegetation plans should be reviewed by the City.

GUIDELINE 6D: HERBICIDES

Herbicide use within and adjacent to riparian corridors should be limited to those specifically labeled for use adjacent to water courses.

GUIDELINE 6E: NON-NATIVE PLANT REMOVAL

Invasive, non-native plants should be removed and replace with native plants in the portion of the riparian corridor adjacent to the property to be developed.

GUIDELINE 7B: WATER QUALITY/DRAINAGE AND RUNOFF

The direct discharge of industrial effluent into the riparian channel, corridor, or floodplain is prohibited. Runoff from industrial uses should be directed away from direct entry to the riparian corridor, or Best Management Practices should be provided and permanently maintained and on-site retention areas used.

ORDINANCE-SIZED TREES AND HERITAGE TREES

City of San Jose Civil Code, Title 13.28.330 –13.28.360 defines and protects Heritage Trees. Title 13.31.010 to 13.32.100 prohibits the removal of trees that are 56 inches or greater at 24 inched above the natural grade or slope without a permit.

SETTING

REGIONAL DESCRIPTION

The proposed project site is located in the Santa Clara Valley within the Urban Service Area of south San Jose and just north of the town of Coyote. The Santa

Clara Valley is bordered by the Santa Cruz Mountains to the west and the Diablo Range to the east. The 14-acre MEC site is situated southeast of the base of Tulare Hill and directly adjacent to Fisher Creek. Land use types of the Santa Clara Valley proper consist of residential, commercial, industrial, agriculture, and open space. Special-status species known to occur in the vicinity or identified during field surveys are listed in **Biological Resources Table 1**, following this section.

SERPENTINE HABITATS

The surrounding hills, including Coyote Ridge to the east, Santa Teresa Hills to the west and Tulare Hill, contain soils derived from serpentine rock and support unique serpentine grasslands, considered a sensitive habitat by the California Department of Fish and Game (CDFG; CNDDB 1999). Serpentine-based rock represents only about one percent of California's geologic base, yet contain 10 percent of California's native flora. Serpentine soils are found in parts of eight counties within the San Francisco Bay Area: Alameda, Contra Costa, Marin, Napa, San Francisco, San Meteo, Santa Clara, and Sonoma).

Serpentine soils provide harsh conditions for plant growth including a low calcium to magnesium ratio, lack of nitrogen, potassium, and phosphorous that are essential to plant growth, and high concentrations of heavy metals that are toxic to plant life. Despite these conditions, serpentine habitats support proportionately high numbers of rare and/or endemic plant species. These endemics have developed several genetic adaptations to tolerate the serpentine environments and have been able to persist due to the lack of competition from nonnative species that are intolerant to serpentine conditions.

Serpentine habitats also support endemic or nearly endemic invertebrates such as the federally threatened bay checkerspot butterfly (*Occidayas editha* spp*. bayensis*) whose primary larval host plant, dwarf plantain (*Plantago erecta*), is abundant on serpentine soils. The Opler's longhorn moth (*Adela oplerella*), a federal species of concern, is found exclusively on its host plant, California cream cups (*Platystemon californicus*), in serpentine soils. The Edgewood blind harvestman (*Calicina sitalcina minor*), also a federal species of concern, are restricted to serpentine soils in the San Francisco Bay Area.

Tulare Hill is a serpentine formation in the center of Santa Clara Valley, immediately west of the MEC site and serves as a stepping stone connection between the serpentine habitats of the Santa Cruz Mountains and Diablo Range. The peak elevation is 565 feet above mean sea level. The federally endangered Santa Clara Valley dudleya (*Dudleya setchellii*) and several invertebrate host species (dwarf plantain, California cream cups, and owl's clover) occur on the hill. Tulare Hill supports the bay checkerspot butterfly during productive years and is listed as a high priority area for this species and an important area for the Opler's longhorn moth in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (Elam et al. 1998). The surrounding Coyote Ridge and Santa Teresa Hills are considered core areas and high priority areas, respectively, for the butterfly (Elam et al. 1998).

FISHER AND COYOTE CREEKS

Fisher Creek is a tributary to Coyote Creek that flows from the Santa Teresa Hills into the Santa Clara Valley along the southern and eastern base of Tulare Hill. Fisher Creek, originally named Laguna Seca Creek, was excavated and channelized in the late 1800's to drain Laguna Seca Lake, west of Santa Teresa Blvd. Fisher Creek supports intermittent occurrences of riparian habitat and sparse vegetation due to disturbance from cattle grazing. Various waterfowl and water birds and warm water fish species occur in Fisher Creek. No special status species are known to occur, but the creek could provide dispersal habitat for the California tiger salamander (*Ambystoma californiense*; federal candidate) and California red-legged frog (*Rana aurora* spp. *draytonii*; federally threatened; Brown, pers comm. 1999). Mt. Hamilton thistle (*Cirsium hamiltonii*), a federal species of concern and CNPS list 1B plant, was observed along Fisher Creek, southwest of the MEC site in 1991. However, the plant was not observed during surveys conducted in March and May of 1999 (Calpine/Bechtel 1999c).

Coyote Creek flows northward into the San Francisco Bay, 38 miles from the MEC site. During heavy rain storms Coyote Creek backflows into Fisher Creek via a culvert under Monterey Road. Landowners constructed a 50-foot wide earthen levee along Fisher Creek from Santa Teresa Boulevard to Monterey Road to prevent flooding onto adjacent lands. The Coyote Creek riparian corridor is a significant feature of the Santa Clara landscape and supports several riparian trees, shrubs, and associated wildlife. Coyote Creek contains habitat for both cold and warm water fish species, including the fall-run chinook salmon (*Oncorhynchus tshawytscha*), is a migration corridor for neotropical migrants, and provides potential breeding and migration habitat for the western pond turtle (*Clemmys marmorata*; federal species of concern), California red-legged frog, and California tiger salamander.

ORDINANCE TREES

Santa Clara County defines ordinance trees as any tree with a diameter at breast height (DBH) of 12 inches or greater at 4.5 feet above ground surface. The City of San Jose defines ordinance trees as any tree having a circumference of 56 inches measured 24 inches above natural grade slope. Removal of ordinance trees requires city and county permits. Ordinance trees in the project vicinity include Valley oak (*Quercus lobata*), elderberry (*Sambucux mexicana*), English walnut (*Juglans regia*), olive (*Lea europaea*), pear (*Malus* sp.), and California coffeeberry (*Rhamnus californica* spp*. californica*). Heritage trees are defined by the city to have a special significance to the community because of a unique quality, species, size, or historic value. Keesling black walnut trees, planted by Horace G. Kessling in the early 1900's, occur throughout the Santa Clara Valley, particularly along Monterey Road. The Keesling black walnut trees were designated by the Sate of California as a Point of Historical Interest in the mid 1980's. A large grove of black walnut trees were planted along the southeastern border of the MEC site; however, these are not listed as Heritage Trees.

SITE VICINITY

POWER PLANT SITE AND LAYDOWN AREA

The proposed MEC site is bordered by Monterey Road and the UPRR railroad tracks on the east, Tulare Hill and Fisher Creek on the north and west, and an agricultural field that extends to Blanchard Road to the south. The power plant will require 10.7 acres for the footprint, including generation facilities, storage tanks, parking area, administration building, water treatment, switchyard, and stormwater detention pond. The site supports elderberry savanna habitat but has been highly disturbed by the current tenant. The site is littered with old cars, trailers, and debris and has several pens holding hundreds of roosters. The area has been severely overgrazed by cattle and goats. Approximately 80 trees are located within the construction area. A temporary construction laydown area will require 12 acres of agricultural land south of the MEC site.

The MEC site has been reconfigured from the original plan provided in the AFC to include a 100-foot setback from the Fisher Creek riparian corridor, in accordance with the City of San Jose's *Riparian Corridor Policy Study* (City of San Jose 1999, Calpine/Bechtel 2000a). The riparian corridor is defined as the entire area within the banks of the creek extending to the top of the bank and encompassing the dripline of riparian trees. The MEC footprint will be elevated to 255 feet with the edge sloping into the setback. A 75-foot wide temporary construction area will be within the riparian corridor on the west side of the cooling tower. A stormwater detention pond located at the southern end of the site will consist of a discharge pipe placed through the Fisher Creek levee and release collected stormwater into Fisher Creek.

The area of Fisher Creek that is adjacent to the MEC site is mostly disturbed from over grazing of cattle. A total of 81 trees, dominated by Valley oak and red willow (*Salix laevigata*), and two shrub species, elderberry and mule fat (*Baccharis viminea*), were identified within the corridor (Calpine/Bechtel 2000b). Fisher Creek has a 50-foot wide levee along the eastern and southern banks. The majority of the riparian vegetation occurs along a band between the top of the inside bank of the levee and the creek. A portion of the levee near the north side of the MEC site has been breached by a Pacific Gas and Electric maintenance easement to access transmission towers and power lines on Tulare Hill.

A roughly graded road located along the western side of Fisher Creek at the base of Tulare Hill functions as a partial levee (about 5 feet lower than the levee across the creek). Intensive grazing of the area has severely disturbed the site as evidenced by bare soil areas and erosion. A natural spring on the southeast flank of Tulare Hill forms a 0.5-acre wetland at the toe of the hill. The wetland is currently overgrazed and trampled by cattle. Water from the spring is collected by hoses and barrels and transported to the MEC site by the current tenant. The southwestern slope of Tulare Hill supports western burrowing owls (*Speotyto cunicularia hypugea*), Santa Clara Valley dudleya, and bay checkerspot butterflies and host plant species. The Hill also supports Opler's loghorn moth and host plant species and may support Edgewood blind harvestman. Historic observations of Metcalf Canyon jewel-flower

(*Streptanthus albidus* ssp. *albidus*) a federally endangered species, are known for the northwest flank of the Hill.

ACCESS ROAD AND LANDSCAPE CORRIDOR

A 150-foot wide access road and landscape corridor is proposed just west of the UPRR tracks, extending from the MEC site south to Blanchard Road. The habitats along this area include 6 acres of agricultural land, ruderal grassland and a row of small trees near the MEC site. No sensitive species occur in these areas.

WATER SUPPLY AND DISPOSAL

Recycled water will be supplied by the South Bay Water Recycling Program. The water will be delivered from the San Jose/Santa Clara Water Pollution Control Plant via a 10.3-mile 20-inch pipeline through San Jose city streets to MEC (SBWR route; Supplement A). The new portion of the pipeline route begins at Sender Road and runs down the middle of city streets to Santa Teresa Blvd, just south of Fisher Creek. This pipeline will then be placed within agricultural land from Santa Teresa Blvd to the MEC site. Cooling process water blowdown (wastewater) and sanitary wastes will be discharged into the San Jose sewer via a 12-inch pipe, running in the same trench through agriculture land as the supply pipe, that will connect to an existing sewer at Santa Teresa Blvd. The wastewater will be treated at the Water Pollution Control Plant before being discharged into the San Francisco Bay under an existing National Pollution Elimination System (NPDES) permit (see Water Resources section).

Domestic water and process makeup water for the HRSG's will be supplied by San Jose MUNI via a 1.25-mile pipeline along the west side of the UPPR tracks from Bailey Avenue to the MEC site. This area is along the proposed access road and is currently in agricultural production.

NATURAL GAS PIPELINE

Natural gas will be delivered via a new 16-inch pipe from the MEC site to an existing PG&E pipe located east of U.S. 101. The pipeline travels from MEC south along the proposed access road to Blanchard Avenue, under the UPPR tracks, Monterey Road, and Coyote Creek, follows Coyote Ranch Road to U.S.101, and under U.S. 101. The pipeline will be constructed using horizontal directional drilling methods to avoid the Coyote Creek corridor. Other portions of the route will follow existing roads.

TRANSMISSION LINE

A new 200-foot long transmission line will run from the MEC site northwest to an existing 230-kV line at the top of Tulare Hill. The new line will span Fisher Creek approximately 70 to 170 feet above ground, approximately 50-ft or more above the riparian tree canopy. Tulare Hill supports several sensitive serpentine endemics, including the bay checkerspot butterfly host plant species and Santa Clara Valley dudlyea. A burrowing owl and den were observed on the west face of the hill during surveys.

BIOLIGICAL RESOURCES Table 1
Special Status Species within the Vicinity of the Metcalf Energy Center

Species Name	Regulatory Status[#]	Suitable Habitat for the Species[†]	Known Occurrence In Project Area
Habitats			
Serpentine bunchgrass	NA	Serpentine soils	Known occurrence on Tulare Hill, Coyote Ridge, and Santa Teresa Hills.
Sycamore alluvial woodland	NA	RIP	Coyote Creek riparian corridor.
Winter-run chinook salmon critical habitat	FE	SF Bay	Critical habitat not in project area.
Delta smelt critical habitat	FT	R (Bay-Delta)	Critical habitat not in project area.
Plants			
Contra Costa goldfields *Lasthenia conjugens*	1B, FE	AG mesic, VP	No suitable habitat in MEC impact areas and none observed during surveys.
Coyote ceanothus *Ceanothus ferrisae*	FE, 1B	CH, AG, SB, CS	No suitable habitat in MEC impact areas and none observed during surveys.
Fragrant fritillary *Fritillaria liliacea*	1B, SC	AG	Suitable habitat in project area, but none observed during surveys in impact areas.
Hall's bush mallow *Malacothamnus hallii*	1B	CH	No suitable habitat in MEC impact areas and none observed during surveys.
Metcalf Canyon jewel-flower *Streptanthus albidus* ssp. *Albidus*	FE, 1B	SB	Historic occurrences on northwest flank of Tulare Hill, but none observed during surveys. May be extirpated from hill (Elam et al. 1998).
Most beautiful jewel-flower *Streptanthus albidus* ssp. *Peramoenus*	SC, 1B	SB, CH	Suitable habitat in project area, but none observed during surveys in impact areas.
Mt. Diablo phacelia *Phacelia phacelioides*	SC	CH	No suitable habitat in MEC impact areas and none observed during surveys.
Mt. Hamilton coreopsis *Coreopsis hamiltonii*	SC, 1B	CW, rocky	No suitable habitat in MEC impact areas and none observed during surveys.

Species Name	Regulatory Status[#]	Suitable Habitat for the Species[†]	Known Occurrence In Project Area
Mt. Hamilton thistle *Cirsium fontinale* var. *campylon*	SC, 1B	CH, AG, SB, OW	Known occurrence along Fisher Creek south of Tulare Hill and in Coyote Creek pond area south of the proposed MEC gas pipeline.
Pappose spikeweed *Hemizonia parryi* ssp. *Congdonii*	SC	AG alkaline	No suitable habitat in MEC impact areas and none observed during surveys.
Rock sanicle *Sanicula saxatilis*	SC, CR, 1B	CH (rocky)	No suitable habitat in MEC impact areas and none observed during surveys.
Santa Clara red ribbons or South Bay clarkia *Clarkia concinna* ssp. *Automixa*	SC, 1B	CW, CH	No suitable habitat in MEC impact areas and none observed during surveys.
Santa Clara Valley dudleya *Dudleya setchellii*	FE, 1B	SB rocky outcrops	Known occurrences on serpentine outcrop areas of Tulare Hill and found during surveys, but not in construction zone.
Smooth lessingia *Lessingia micradenia* var. *glabrata*	SC, 1B	CH, SB	Suitable habitat in project area, but none observed during surveys in impact areas.
Tiburon Indian paintbrush *Castilleja affinis* ssp. *neglecta*	FE, CT, 1B	SB (rocky), AG	Suitable habitat in project area, but none observed during surveys in impact areas.
Invertebrates			
Bay checkerspot butterfly *Occidryas editha* ssp. *bayensis*	FT	SB	Known habitat and occurrences on Tulare Hill assumed present..
Edgewood blind harvestman *Calicina sitalcina minor*	SC	SB	Potential habitat in moist areas of Tulare Hill, but not found during surveys.
Opler's longhorn moth *Adela oplerella*	SC	SB	Known population occurrence on Tulare Hill assumed present.
Ricksecker's water scavenger beetle *Hydrochara ricksecker*i	SC	VP, W	No suitable habitat in MEC impact areas and none observed during surveys.
Unsilvered fritillary butterfly *Speyeria adiaste adiaste*	SC	CW	No suitable habitat in MEC impact areas and none observed during surveys.

Fish

Species Name	Regulatory Status[#]	Suitable Habitat for the Species[†]	Known Occurrence In Project Area
Central California Coast steelhead *Oncorhynchus mykiss*	FT	R	Potential migration and spawning habitat in Coyote Creek.
Fall/late fall-run chinook salmon *Oncorhynchus tshawytscha*	C	R	Potential migration and spawning habitat in Coyote Creek.
Spring-run chinook salmon *Oncorhynchus tshawytscha*	FT	R	Project area outside distribution of species.
Delta smelt *Hypomesus transpacificus*	FT, ST	R, SL	Project area outside distribution of species.
Longfin smelt *Spirinchus thaleichthys*	SC	R	Project area outside distribution of species.
Sacramento splittail *Pogonichthys macrolepidotus*	FT	R, SL	Potential spawning habitat in Coyote Creek.
Winter-run chinook salmon *Oncorhynchus tshawytscha*	FE, SE	R	Project area outside distribution of species.
Reptiles and Amphibians			
California horned lizard *Phrynosoma coronatum* ssp. *frontale*	SC	OW, RIP, CH, ID	No suitable habitat in project impact area.
California red-legged frog *Rana aurora* ssp. *draytonii*	FT	SL, W	Known historic occurrence from upper Fisher Creek drainage. Potential dispersal habitat along Fisher and Coyote creeks.
California tiger salamander *Ambystoma californiense*	C	AG, VP	Potential dispersal and aestivation habitat along Fisher creek.
Foothill yellow-legged frog *Rana boylii*	SC	R (with rocky bottom)	No suitable habitat in project impact area.
Western pond turtle *Clemmys marmorata*	SC	SL, R, W	Potential habitat in ponds of Fisher Creek and Coyote creeks.
San Joaquin coachwhip *Masticophis flagellum ruddocki*	SC	AG, OW, CH	No suitable habitat in project impact area.

Species Name	Regulatory Status[#]	Suitable Habitat for the Species[†]	Known Occurrence In Project Area
Silvery legless lizard *Anniella pulchra pulchra*	SC	ID	No suitable habitat in project impact area.
Western spadefoot toad *Scaphiopus hammondii*	SC, CSC	AG, VP, OW	No suitable breeding habitat in project area, rarely roams far from breeding areas.
Birds			
American peregrine falcon *Falco peregrinus anatum*	SE, FP, (FE-delisted)	AG, W	Potential occasional winter forage on Tulare Hill and agriculture land.
Bald eagle *Haliaeetus leucocephalus*	FT, SE	AG	No suitable habitat in project area.
Bell's sage sparrow *Amphispiza belli belli*	SC	CH	No suitable habitat in project area.
Black swift *Seloides niger* (nesting)	CSC	Cliffs near waterfalls	None observed during survyes.
Great blue heron (rookery site) *Ardea herodias*	CSC	RIP	Potential rookery habitat in Coyote Creek corridor, none observed during surveys.
Ferruginous hawk *Buteo regalis*	SC, CSC	AG	Potential occasional winter forage on Tulare Hill and agriculture land.
Little willow flycatcher *Empidonax traillii brewsteri*	SE	Willow thicket at >2,000' elevation	No suitable habitat in project area.
Marbled murrelet *Brachyramphus marmoratus*	FT	CW, MA	No suitable habitat in project area.
Tricolored blackbird *Agelaius tricolor*	SC, CSC	W, C	Potential suitable habitat along portions of Fisher Creek. None observed in project area..
White-tailed kite *Elanus leucurus*	SC, FP	AG, RIP	Potential for nesting in trees on MEC site and Coyote Creek riparian corridor and forage on Tulare Hill and crop lands.
Western burrowing owl *Athene cunicularia* ssp. *hypugea*	SC, CSC	AG	One owl and den observed on Tulare Hill in February 1999 above MEC project site.
Golden eagle *Aquila chrysaetos*	FP, CSC	AG, CS	Known to nest at Calero Reservoir; observed foraging on Tulare Hill and Coyote Ridge.
Mammals			

Species Name	Regulatory Status[#]	Suitable Habitat for the Species[†]	Known Occurrence In Project Area
Fringed myotis bat *Myotis thysanodes*	SC	OW	Potential habitat along Coyote Creek riparian corridor.
Greater western mastiff bat *Eumops perotis californicus*	SC, CSC	OW, CS, CH	Potential habitat along Coyote Creek riparian corridor.
Long-eared myotis bat *Myotis evotis*	SC	OW	Potential habitat along Coyote Creek riparian corridor.
Long-legged myotis bat *Myotis volans*	SC	CH, OW	Potential habitat along Coyote Creek riparian corridor.
Pacific western big-eared bat *Plecotus townsendii townsendii*	SC, CSC	OW	Potential habitat along Coyote Creek riparian corridor.
Small-footed myotis bat *Myotis ciliolabrum*	SC	OW	Potential habitat along Coyote Creek riparian corridor.
Yuma myotis bat *Myotis yumanensis*	SC, CSC	RIP, CH	Potential habitat along Coyote Creek riparian corridor.
Riparian brush rabbit *Sylvilagus bachmani riparius*	FE, SE	OW, RIP	Potential habitat along Coyote Creek riparian corridor. None observed during surveys.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	SC, CSC	CH, RIP	Potential habitat in Fisher Creek riparian corridor. None observed near MEC site.
San Joaquin kit fox *Vulpes macrotis mutica*	FE, ST	AG	Known historic (1975) habitat east of U.S. 101 on Coyote Ridge.

[#] Federal-, state-, and CNPS-listed species.
FE: Federally Endangered.
FT: Federally Threatened.
SC: Federal Species of Concern.
PE: Federal Proposed Endangered.
PT: Federal Proposed Threatened.
C: Candidate Species for Listing
SE: California Endangered.
ST: California Threatened.
CPE: California Proposed Endangered.
CSC: California Species of Special Concern.
FP: California Fully-Protected species.

[+] Abbreviations for habitat areas.
AG: Annual grassland.
AW: Alkali wetlands.
C: Crop.
CH: Chaparral.
CS: Coastal sage scrub.
CW: Coniferous woodland.
ID: Interior dunes.
MA: Marine.
OW: Oak woodland.
R: River system and tributaries, open water.
RIP: Riparian habitat along Coyote Creek.
SB: Serpentine bunchgrass.

Species Name	Regulatory Status#	Suitable Habitat for the Species†	Known Occurrence In Project Area

CR: California Rare.
1A: Extinct.
1B: CNPS rare or endangered in California and elsewhere.
2: CNPS rare or endangered in California, more common elsewhere.

SL: Sloughs, slow moving water, lake.
W: Wetland habitat; fresh and/or brackish.
VP: Vernal pool.

IMPACTS

PROJECT SPECIFIC DIRECT AND INDIRECT IMPACTS

DIRECT IMPACTS

The MEC project has been designed to reduce direct impacts to sensitive biological resources. The power plant, laydown area, and access roads are located in disturbed habitats or agricultural fields. The power plant is positioned to adhere to a 100-foot setback from the Fisher Creek riparian corridor. The pipeline routes are mostly located in roadways and agricultural fields, and will be horizontal directional drilled to avoid sensitive habitats such as Coyote Creek and its associated riparian corridor.

Direct impacts associated with the project are:

- Temporary loss of 10,500 square feet of serpentine habitat from the connection of the new transmission line to the existing line.
- Potential bird collisions with the new 200-ft transmission line and two 145-ft tall HRGS's stacks.
- Temporary disturbance to the riparian corridor from construction activities.
- Water quality degradation from stormwater discharge into Fisher Creek.
- Loss of 80 trees, of which 59 fall under the definition of Santa Clara County significant tree and 53 fall under the definition of the City of San Jose significant tree.

Construction of the transmission line will require a crane and flatbed truck and will result in temporary disturbance to an area about 500 square feet on the south side of existing PG&E tower 0/6 and a 50-ft radius around the tower, for a total area of about 10,500 square feet. (Crowe 2000, pers. comm) No grading or blading is required. The habitat is serpentine grasslands that support host plant species for

the bay checkerspot butterfly and Opler's longhorn moth. Impacts to larvae could occur from soil compaction and dust. No Santa Clara Valley dudleya were observed in the impact area.

The new conductors will span Fisher Creek and could increase incidences of avian collisions. Currently, the area is not heavily used by waterfowl; however, plans to restore the riparian corridor could result in increased use. Nonetheless, the span is short (200 ft total and 20 ft over Fisher Creek) and 50 feet above the creek. Birds will likely avoid the two 145-foot tall HRGS's stacks due their location relative to topographical features. Flight patterns in the area will likely be high due to the trees and Tulare Hill or within the riparian corridor proper (APLIC 1996). Therefore, the risk of avian collision is low and should not cause a significant impact.

To Comply with the City of San Jose's *Riparian Corridor Policy Study* (City of San Jose 1999), Calpine/Bechtel redesigned the project so that all buildings, other structures, impervious surfaces, and ornamental landscape areas would be located outside the 100-foot setback from the riparian corridor (Calpine/Bechtel 2000ab). The edges of the elevated footprint would slope into the setback area for a distance of about 80 feet along the west and 60 feet from the bank along at the northwest corner. During construction, a temporary 75-foot construction area will be located within the riparian corridor and 11 non-riparian trees (7 black walnut, 3 English walnut, and 1 plum) will be removed. Eighty-one trees within the corridor will not be removed. The construction area will be restored and replanted with riparian trees after construction (Calpine/Bechtel 2000b, Appendix A). A 10-foot wide strip adjacent to the fence and within the 100-foot setback will be kept clear of vegetation using a herbicide considered safe to wildlife and water resources, such as roundup. Currently, the vegetation in the riparian corridor is highly disturbed and fragmented, mostly from poorly managed cattle grazing. Replacement trees would be native species and the Tree Mitigation Planting Plan would add 4.3 acres of riparian habitat. Silt fencing, hay bales, and temporary settling ponds will be used to prevent silt and debris from entering Fisher Creek during construction. A permanent fence will be installed around the wetland and riparian corridor to prevent cattle trespass. Existing unnatural barriers to the spring that feeds the wetland will be removed. Restoration plans proposed by Calpine/Bechtel will enhance the value of the corridor for both wildlife and aquatic resources. Therefore, impacts from construction in the riparian corridor are temporary and not considered significant.

A stormwater detention basin will be constructed outside the riparian corridor in the southwest corner of the MEC site. Stormwater would be delivered to the basin via underground collection pipes that run throughout the plant site and diverted into Fisher Creek via a discharge pipe. The discharge pipe will run through the Fisher Creek levee, but will avoid riparian vegetation. Stormwater runoff will be isolated from spill containment areas and is not expected to be of poor quality. Runoff and discharge are monitored and controlled under a National Pollution Discharge

Elimination System (NPDES) permit issued by the State Water Quality Control Board (See Water Resources Section). Under this permit, Calpine/Bechtel is required to prepare a stormwater pollution prevention plan that documents storage

and handling of hazardous material and waste. Additionally, a Section 404 Permit (Nationwide Permit #7) and Streambed Alteration Agreement will be required by the Army Corps of Engineers and California Department of Fish and Game, respectively, to construct the outflow pipe.

A *Riparian Corridor Biotic Assessment and Tree Removal Plan* was developed by Calpine/Bechtel (2000b) in accordance with the requirement set forth in the City of San Jose's Riparian Corridor Policy (San Jose 1999) if a proposed project lies within or adjacent to a riparian corridor within the Urban Service Area. Trees on the MEC site were surveyed, measured, mapped and photographed by a licensed arborist. One hundred sixty one trees were documented on the MEC site. Of these, 80 trees within the MEC site and temporary construction zone will be removed. While 11 of these are within the 100-foot setback area, none are within the riparian corridor proper (defined as the outer boundary of the existing riparian vegetation, including the dripline of trees). Of the 80 trees that will be removed, 59 are Santa Clara county ordinance trees. Currently, four of the 80 trees are within the City of Jose. These are not ordinance-sized trees (less than 12 inches diameter at breast height). If the MEC site is incorporated into the City of San Jose, 53 of the 80 trees meet the definition of city ordinance trees. Tree removal permits will be required from Santa Clara County and the City of San Jose.

INDIRECT IMPACTS

Indirect impacts associated with the construction and operation of the MEC project include:

- Temporary reduction in the number of trees that could potentially be used by birds for nesting and foraging.
- Artificial night lighting and noise.
- Nitrogen deposition on serpentine habitat.

The removal of 80 trees will result in the temporary loss of potential nesting and foraging habitat for raptors, songbirds, and water birds. No active nests were observed during surveys. Construction activities will likely reduce bird use in the area. However, bird use will likely resume and increase once construction and riparian enhancement measures are completed.

The City of San Jose's *Riparian Corridor Policy Study* require projects adjacent to riparian corridors to be designed to minimize potential impacts to wildlife from lighting (Guideline 2E) and noise (Guideline 2F). Lights can disorient migratory birds flying at night or attract wildlife, such as insects and insectivores. Noise generated during operation of the facility in expected to be 60 dBA, which is about as loud as normal speech at 3 feet (Calpine/Bechtel 2000b). Noise generated during construction is expected to be about 75 to 90 dBA. Impacts of noise and lighting to wildlife resources are difficult to quantify. Wildlife use in the area is currently low and intermittent light and noise are currently generated by road traffic on Monterey Road. Construction noise will likely reduce diurnal wildlife activity (e.g. birds) in the area. However, once construction and the riparian enhancement program are completed, it is anticipated that noise and light will be buffered by the

new trees. Lights used in the facility will be minimized and oriented downward to reduce illumination off-site (Calpine/Bechtel 2000b).

MEC will operate two natural gas-fired combustion turbines with heat recovery steam generators (HRSG's) that will discharge exhaust gases into the atmosphere through 145-foot tall stacks. Emissions include sulfur dioxides, nitrogen dioxides (NOx), and particulate matter with an aerodynamic diameter or 10 microns or less (PM_{10}). Additionally, ammonia (NH_3) emissions will occur as a by-product of the Selective Catalytic Reduction technology used to limit NOx emissions. Of particular concern are impacts of the NOx emissions on surrounding serpentine soils and their associated endemic species.

Nutrient-poor serpentine soils support an array of plant species specifically adapted to the edaphic conditions. Nitrogen is the primary limiting nutrient for plant growth on these soils, and the lack of adequate growth conditions has prevented the invasion of non-native grass species. In the vast majority of areas in California where serpentine soils do not exist, non-native grasslands have virtually eliminated native species and serpentine soils serve as the last refugia for many native grassland flora (Weiss 1999). Nitrogen deposition, primarily from industrial and vehicle emissions, artificially fertilize the soils, creating better conditions for the non-native species to persist and ultimately out-compete the native species. The displacement of serpentine endemics by non-native species, and subsequent decline in bay checkerspot butterfly individuals and plant host species, has been documented in the Santa Clara Valley (Weiss 1999).

Nitrogen atmoshperic deposition in the Fremont and San Jose areas is reported to be 7 kg/ha-yr by the California Air Resources Control Board (CARB). These estimates have an uncertainty value of 30 to 50 percent, resulting in estimates between 4 and 10.5 kg/ha-yr. Weiss (1999) adjusted these figures based on surface composition, seasonality of serpentine grasslands, and higher pollution levels in the South Bay Area to derive at deposition rates of 10 to 15 kg/ha-yr. These estimates have an uncertainty of 50 percent, for a range of 5 to 22.5 kg/ha-yr. The nitrogen deposition rate considered sufficient to affect ecosystem structure and diversity is 3 to 10 kg/ha-yr. Therefore, the area already has levels of nitrogen that exceed this threshold. Weiss (1999) concluded that the transformation of serpentine soils and decline of bay checkerspot butterfly populations in the area are related to fertilization by atmospheric nitrogen deposition.

Tulare Hill supports host plant species, serpentine endemics, necessary for the survival of bay checkerspot butterfly and Opler's longhorn moth. More importantly, the surrounding Coyote Ridge and Kirby Canyon support important core areas for the bay checkerspot butterfly (Elam 1999). These core areas support numbers of butterflies high enough to sustain the population. Without these core areas, butterfly numbers would decline to levels too low to maintain viable population levels.

Calpine/Bechtel prepared an *Impact Analysis for Metcalf Energy Center NOx Emissions, Santa Clara County, California* to determine potential impacts from nitrogen deposition from MEC emissions on surrounding serpentine landscapes (Calpine/Bechtel 2000c). Wet and dry deposition were modeled using the Industrial

Source Complex Short Term, Version 3 (ISCST3) model for gaseous pollutants. Conservative modeling assumptions were used to produce worse-case results, including the assumption that all nitrogen leaving the exhaust stacks would be in the form of depositional nitrogen (nitrate and ammonium ions). Cumulative deposition rates were calculated as the sum of deposition from the operation of MEC plus a background estimate of 12.5 kg/ha-yr.

Annual deposition of nitrogen on Tulare Hill and nearby Coyote Ridge from the operation of MEC alone were estimated to be 0.78 and 0.28 kg/ha-yr, respectively. Cumulative nitrogen deposition on Tulare Hill and Coyote Ridge were estimated to be 13.3 and 12.8 kg/ha-yr, respectively. While the contribution of nitrogen from MEC operation alone is relatively low, the cumulative values exceed the high range of nitrogen deposition (10 kg/ha-yr) considered sufficient to affect ecosystem structure and diversity. In fact, the range of the estimates of ambient nitrogen (7 to 10 -15 kg/ha-yr) exceed the lower nitrogen-plant threshold limit. Therefore, impacts to federally threatened bay checkerspot butterfly and the federal species of Concern Opler's longhorn moth from the elimination of essential host plant species from MEC operations are significant. In addition, nitrogen emissions would similarly impact the Metcalf canyon jewel flower, a federally endangered serpentine endemic plant species that occurs on Coyote Ridge.

CUMULATIVE IMPACTS

The California Environmental Quality Act (CEQA) defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Future proposed development in the Santa Clara Valley includes the Coyote Valley Research Park (Cisco Systems Project), an urban reserve development involving 25,000 dwellings on 170 acres, and a residential development in south Coyote Valley (Greenbelt).

Automobile use and emissions will greatly increase in the valley as a result of these developments; it is anticipated that the proposed Cisco development alone will result in 20,000 employees and potentially more vehicles during commuter hours (see Air Quality section). The NOx deposition study by Calpine/Bechtel did not address cumulative impacts. Therefore, staff issued a data request in March 2000 for Calpine/Bechtel to evaluate this issue. The analysis is still pending. Ambient nitrogen deposition and cumulative deposition from ambient and projected increases from MEC exceed the threshold considered significant to alter plant composition and threatens local serpentine endemics. Consequently, cumulative impacts from the additional proposed developments to serpentine endemics from nitrogen deposition will likely be significant.

MITIGATION

CALPINE/BECHTEL PROPOSED MITIGATION MEASURES

Calpine/Bechtel has proposed the following mitigation measures to reduce potential impacts to biological resources.

GENERAL MITIGATION MEASURES

- Provide worker environmental awareness training.
- Provide construction monitoring by a qualified Designated Biologist.
- Prepare a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that details how mitigation measures will by implemented.
- Set-up exclusion zones to avoid sensitive habitats and species during construction.
- Construct silt fencing to avoid run off into Fisher Creek.
- Prohibit pesticide and herbicide use in project areas, except for a 10-foot wide area surrounding the facility boundary fenceline.
- Conduct preconstruction surveys for sensitive species.
- Prepare monthly and/or annual monitoring and compliance reports that analyze the effectiveness of mitigation measures.

FISHER CREEK MITIGATION MEASURES

The following proposed mitigation measures were provided in the *Riparian Corridor Biotic Assessment and Tree Removal Plan* (Calpine/Bechtel 2000b):

- Implement a 100-foot setback buffer zone from the Fisher Creek corridor.
- Conduct pre-construction surveys along Fisher Creek for California red-legged frog, western pond turtle, foothill yellow-legged frog, and California tiger salamander.
- Plant a total of 320 native trees and enhance Fisher Creek riparian corridor.
- Install permanent fencing to prevent cattle access to Fisher Creek and tree planting areas.
- Implement erosion control measures, including Best Management Practices, during construction of the stormwater dishcharge pipe in accordance with a CDFG Streambed Alteration Agreement.
- Remove debris from Fisher Creek.
- Protect existing riparian vegetation before and after construction.
- Restore the spring and wetland to a natural state by removing water collection pipes and excluding cattle.

ORDINANCE TREES

The following proposed measures were provided in the *Tree Mitigation Planting Plan* (Calpine/Bechtel 2000b; Appendix A) to mitigate the removal of Santa Clara County and City of San Jose Ordinance sized trees.

- Trees more than 18 inches DBH replaced at a ratio of 4:1 using 24-inch box trees.
- Trees 12 to 18 inches DBH replaced at a ratio of 2:1 using 24-inch box trees.

- Trees less than 12 inches DBH replaced at a ratio of 1:1 using 15-gallon trees.
- Black Walnuts would be replaced by Valley oak, buckeye, sycamore, and coast live oak.
- English walnuts would be replaced by Valley oak.
- Coffeeberry would replace almond, olive, and fruit trees.
- To account for mortality losses of replacement trees, the total number of trees planted will be increased by 25% (for a total of 320 replacement trees).
- Three planting areas will be located along the riparian corridor. A forth planting area will be located within a visual screen landscape corridor along the southern end of the MEC site.
- Shrubs planted on the site will include elderberry, coyote brush, and mule fat.
- Maintenance of the mitigation plants would occur for a period of at least two years.
- Monitoring and, if necessary, remedial planting, would occur for at least 3 to 5 years.

TULARE HILL MITIGATION MEASURES- TRANSMISSION LINES

Mitigation proposed below, provided in Calpine/Bechtel's Biological Assessment (Calpine/Bechtel 2000d), will be implemented during construction of the new 200-foot transmission line. These were adopted from PG&E's *Low Effect -Habitat Conservation Plan for the Bay Checkerspot Butterfly for the Metcalf-Edenvale 115 kV Reconductor and Mecalf-Monta Vista 230 kV 4th Circuit Transmission Lines, Santa Clara County, California* (PG&E 1998).

- Set up temporary construction zone limits using wooden stakes and flagging tape to delimit work areas.
- Limit equipment and workers to construction zones.
- Restrict construct activities as much as possible to late summer/early fall months (June through September) to avoid impacting breeding adult Bay checkerspot butterflies and Opler's longhorn moth.
- Use appropriate erosion control measures during wet weather months to prevent damage to serpentine habitat.
- Implement fire protection measures during construction.
- Use protective construction material in the impact zone to minimize soil compaction and damage to vegetation.
- Use protective material or water spray during construction to reduce dust and to protect dormant butterfly and moth larvae.
- Conduct post construction surveys to determine damage to annual host plant species and implement a restoration planting if necessary.
- Provide a monitoring report with pre- and post-construction photographs to document impacts and, if necessary, planting results.

SERPENTINE HABITATS

Weiss (1999) determined well-managed cattle grazing to be essential toward maintaining serpentine endemics threatened by excessive nitrogen deposition. Cattle select the grasses over forbs, which helps prevent the non-native grasses from overcrowding the native annuals. In areas where cattle were removed, the serpentine endemics, including the bay checkerspot butterfly, disappeared. Conversely, butterflies returned to an area where they were formerly extirpated after cattle were reintroduced.

Tulare Hill is 339 acres. The parcel Calpine/Bechtel controls via a sale/purchase option agreement with Tulare Hill Corporation includes 116 acres of Tulare Hill. The remaining acres are owned by PG&E (45 acres), Tulare Hills Corporation (37 acres), and a private land owner (141 acres). To reduce impacts to serpentine endemics on Tulare Hill, Calpine/Bechtel proposed to manage the 116-acre portion of Tulare Hill under their control (Calpine/Bechtel 1999f). The hill is currently grazed at one cow per three acres and Calpine/Bechtel would change that regime to one cow per 10 acres. This guideline is being used at nearby Kirby Canyon under a Conservation Agreement with USFWS to perpetuate serpentine habitats. Calpine/Bechtel do not intend to fence the 116-acre portion and will only maintain responsibility for managing that area under their control. Therefore, this management scheme could be hampered if other land owners graze at greater intensity or decide to change the land use entirely.

At an Energy Commission workshop on Biological Resource issues of the MEC project (February 2000), Dr. Weiss of the Center for Conservation Biology stated that management of Tulare Hill alone would not secure the bay checkerspot population. Impacts from nitrogen emissions on Coyote Ridge presented a much greater problem due to the high sensitivity of this area to the long-term survival of the bay checkerspot butterfly. Coyote Ridge is the core or source population for the area. Tulare Hill only supports intermittent populations of the butterfly and is dependent on the health of populations on Coyote Ridge. The last confirmed sighting of bay checkerspot butterfly on Tulare Hill was in 1995.

Calpine/Bechtel submitted a new proposal that provided a list of options to mitigate impacts from NOx emissions (Calpine/Bechtel 2000cd). Mitigation would include one or more of the following:

- Acquire, preserve in perpetuity, and manage cattle grazing on the 116-acre parcel of Tulare Hill.
- Implement an adaptive management strategy that depends on habitat responses to cattle grazing on Tulare Hill.
- Provide funding to Santa Clara County Parks to reinstate grazing on Santa Teresa County Park lands for the benefit of serpentine endemics.
- Provide funds to Santa Clara County, City of San Jose, USFWS, CDFG, or other relevant source for starting a regional Habitat Conservation Plan that would address serpentine habitat in Santa Clara County.

To determine mitigation type and funding, Calpine/Bechtel calculated the acreage of serpentine habitat affected by MEC nitrogen deposition (Calpine/Bechtel 2000d). Air modeling indicated that 6,677 acres (or 70%) of the 9,538 acres of serpentine habitat remaining in Santa Clara County would be within the MEC project nitrogen deposition area. Nitrogen deposition on Coyote Ridge from the MEC project (0.198 kg/ha-yr[1]) would represent 1.56 percent of the existing background deposition of 12.5 kg/ha-yr. Calpine/Bechtel than states it should only be held responsible for 1.56% of the undeveloped serpentine habitat (6,677 acres) or 104 acres.

To mitigate, Calpine/Bechtel proposed to purchase the 116 acres of Tulare Hill for $1,160,000 ($10,000 per acre), contribute $900,000 for management and monitoring ($30,000/year for 30-years), spend $40,000 on cattle fencing and water troughs, and contribute $50,000 to fund either a regional Habitat Conservation Plan or to promote serpentine management on Santa Teresa County Park lands (Calpine/Bechtel 2000d).

CEC STAFF PROPOSED MITIGATION

Staff concurs that mitigation proposed by the applicant for direct impacts to Fisher Creek, Ordinance trees, and construction of the transmission line on Tulare Hill are sufficient to reduce impacts to less than significant levels. In fact, the Fisher Creek enhancement plan would greatly increase the size and value of the existing riparian habitat. However, staff has determined that current measures to mitigate indirect and cumulative impacts to serpentine habitats from increased nitrogen deposition to an already stressed ecosystem may not reduce impacts to less than significant levels. While staff concurs that the level of nitrogen deposition from the MEC project alone is insignificant, the system is currently over-saturated and exceed levels that alter serpentine ecosystems. While staff further concurs that cattle grazing has been shown as an effective tool to manage serpentine soils and prevent habitat alteration to non-native grasslands, the measures proposed to manage Tulare Hill alone are not sufficient to reduce potential impacts to critical core areas of the bay checkerspot butterfly and other serpentine endemic species. Finally, staff believes that the mitigation proposed by Calpine/Becthel is not finalized to a level of certainty that would guarantee the measures can be implemented.

Calpine/Bechtel's proposal to manage and monitor the unfenced 116 acres of the 339-acre Tulare Hill at one cow per ten acres would not be enforceable if other landowners graze the hill at current levels. Contingency plans should incorporate fencing or a cooperative agreement with the other land owners. However, securing Tulare Hill may do nothing to protect the bay checkerspot butterfly if impacts from nitrogen deposition on the critical core area of Coyote Ridge are unmitigated. The NOx study used conservative estimates to derive at an extreme worse case scenario. Additionally, the NOx study states that levels of ambient nitrogen used (12.5 kg/ha-yr) do not reflect a substantial reduction in NOx emissions that has occurred in the area since the underlying measurements were made in the late

[1] This value, 0.198 kg/ha-yr, differs from the value for NOx deposition on Coyote Ridge (0.28 kg/ha-yr) given in the NOx analysis (Calpine/Bechtel 2000c). E.J. Koford (2000) stated that the NOx model had been revised to incorporate an area weighted average (versus a maximum fall out that was previously assumed) to provide a more accurate estimate of nitrogen deposition.

1980's and early 1990's (Calpine/Becthel 2000c, pg 7). It's possible that more refined calculation would show a lesser degree of impact to Coyote Ridge. If not, Calpine/Bechtel should pursue options to purchase and manage serpentine lands on the critical Coyote Ridge area. Final compensation must include an endowment fund to manage and administer the land in perpetuity rather than just the 30-year commitment proposed.

Calpine/Bechtel's proposal to provide funds towards the development of an HCP or to Santa Clara County Parks has not been fully negotiated with the other parties. The U.S. Fish and Wildlife Service (USFWS) is very supportive of developing a regional HCP for the bay checkerspot butterfly with the City of San Jose and/or Santa Clara County. However, USFWS has been unsuccessful at getting either of these agencies to initiate the process. Calpine/Bechtel are currently discussing the feasibility of this option with these agencies.

Calpine/Bechtel must develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that provides a detailed account of how all the mitigation measures proposed above will be implemented.

FACILITY CLOSURE

Sometime in the future, the MEC will experience either 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 Biological Resources Mitigation Implementation and Monitoring Plan prepared by the applicant

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

The area required for the power plant and water pipelines are in disturbed or developed habitats. The natural gas pipeline will be in agricultural lands, along existing roads, or will be horizontally directional drilled under Coyote Creek. The facility closure plan needs to address habitat restoration measures to be implemented in the event of a planned or an unexpected permanent closure. Habitat restoration measures that should be addressed include such tasks as the removal of all structures and the immediate implementation of habitat restoration measures to establish native plant species and native habitat. Because 116 acres of Tulare Hill serpentine habitat are included in the parcel Calpine/Bechtel will purchase, the plan should address long-term preservation of Tulare Hill. In addition, planned or unexpected permanent facility closure may also trigger the removal of the transmission conductors.

UNEXPECTED TEMPORARY CLOSURE

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the MEC. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the

facility closure measures provided in the on-site contingency plan and Biological Resources Mitigation Implementation and Monitoring Plan would need to be implemented.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The MEC project has the potential to result in significant adverse effects, both indirectly and cumulatively, to serpentine soils and associated federally listed species. Mitigation measures to reduce these impacts to less than significant levels are still unresolved to the satisfaction of Energy Commission staff or USFWS. Energy Commission staff can not recommend certification of the project until the applicant has resolved this issue.

COMPLIANCE WITH LORS

Calpine/Bechtel must obtain a federal Biological Opinion from the USFWS. U.S. Environmental Protection Agency (EPA) has initiated formal consultation under section 7 of the Endangered Species Act with USFWS and the National Marine Fisheries Service. The applicant is currently requested a Nationwide Permit 7 from EPA for the stormwater outflow and will need a Streambed Alteration permit from CDFG and a NPDES permit from the State Water Quality Control Board. The applicant will also require City and County permits for the removal of up to 59 ordinance-sized trees. A draft BRMIMP must be provided the Energy Commission staff prior to the Final Staff Assessment.

RECOMMENDATIONS

Calpine/Bechtel, in consultation with USFWS, Dr. Weiss, and Energy Commission staff, is currently reviewing options for mitigating impacts to serpentine endemics from nitrogen deposition from the MEC project. Calpine/Bechtel must also complete an analysis of cumulative impacts associated with nitrogen deposition. Once these are complete, staff can re-evaluate this analysis and conclusions. Conditions of Certification will not be recommended until the analysis is complete.

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SOIL AND WATER RESOURCES

Lorraine White and Joseph O'Hagan

INTRODUCTION

This section of staff's Preliminary Staff Assessment (PSA) analyzes potential effects on soil and water resources by the Metcalf Energy Center (MEC), 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 and standards. 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. This analysis is based on information received by the Commission as of March 30, 2000.

Flooding and drainage issues are addressed in the **Facility Design**, and **Geology and Paleontology** sections of this document.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 USC §1257 et seq.) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) Permits. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with transmission and pipeline construction also fall under this act and are addressed through a general NPDES permit. Section 307 and 403 of the Act (33USC Sect. 1317,1343), requires that all non-domestic discharges to wastewater treatment plants must receive a pretreatment permit. This permit is to ensure that the discharge will not interfere with the treatment processes at the plant or make the facility violate its own discharge permit limitations.

In California, the requirements of the Clean Water Act are administered by the nine Regional Water Quality Control Boards (RWQCBs). Section 404 of the Act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. Site specific or general (Nationwide) permits for such discharges are issued by the Army Corp of Engineers (ACOE) and are certified by the Regional Water Quality Control Boards.

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 San Francisco Bay Regional Water Quality Control Board's (SFBRWQCB) San Francisco Bay Basin Water Quality Control Plan (Basin Plan) ([SFBRWQCB] 1995).

Under provisions of the Clean Water Act, the SWRCB adopted two general National Pollutant Discharge Elimination System (NPDES) Permits for control of stormwater runoff during construction and operation of industrial facilities, such as a power plant and associated facilities.

Ground disturbance activities affecting greater than five acres are required, under the General Construction Activity Storm Water Permit, to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan identifies best management practices to reduce sediment, oil and other contaminants in stormwater discharges from the site. The general NPDES permit for Industrial Activities also requires industrial facilities, such as power plants, to prepare and implement a SWPPP that identifies best management practices to reduce the discharge of contaminants from facility operation in stormwater discharge.

STATE WATER RESOURCES CONTROL BOARD POLICY 75-58

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the SWRCB which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted by SWRCB on June 19, 1975 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should, in order of priority come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. This policy goes on to address cooling water discharge prohibitions.

STATE WATER CODE SECTION 13551 ET SEQ.

Section 13551 of the Water Code prohibits the use of "…water from any source of quality suitable for potable domestic use for nonpotable uses, including …industrial… uses, if suitable recycled water is available…" given conditions set forth in section 13550. These conditions take into account the quality and cost of the water, the potential for public health impacts and the effects on downstream water rights, beneficial uses and biological resources.

Section 13552.6 of the Water Code states that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable; the use is not detrimental to public health, will not impact downstream users or biological resources and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

LOCAL

San Francisco Regional Water Quality Control Board – establishes standards and requirements for the Recycled Water Use Permit issued by the South Bay Recycle Program; issues construction and stormwater NPDES permits.

Santa Clara Valley Water District – controls surface water discharge; well construction and flood management.

Santa Clara County – establishes grading and stormwater pollution control requirements (Ordinance No. NS1203.35 and NS517.55) and implements the Santa Clara County Non-point Source Pollution Control Program (1993).

San Jose/Santa Clara WPCP - requires an Industrial Wastewater Discharge Permit for wastewater discharges to the San Jose Municipal sewer system.

South Bay Water Recycling Program - establishes requirements for planning, constructing and operating a recycled water system for both new and existing facilities. Site-specific requirements may be set forth in the Recycled Water Use Permit (Rules and Regulations, August 1996).

City of San Jose

- sets forth excavation and grading requirements.

- specifies that new development is expected to pay the capital costs for infrastructure required to support it (City of San Jose General Plan, Growth Management Strategy).

- establishes guidelines and development restrictions to protect water quality and riparian habitat (Riparian Corridor Policy Study, March 1999).

- specifies water quality objectives and states that no measurable degradation of groundwater quality will be permitted and that stormwater runoff will not add to the

potential for downstream flooding (North Coyote Valley Campus Industrial Area Master Development Plan: Environmental Performance Standards).

- requires that stormwater drainage systems be designed to protect against the 100-year frequency storm (Design Guidelines for Storm Drains, April 1990).

ENVIRONMENTAL SETTING

SITE DESCRIPTION

Calpine/Bechtel are proposing to locate the MEC on the southern base of Tulare Hill in South San Jose at the north edge of Coyote Valley. Coyote Valley is in the Santa Clara Valley that extends from the San Francisco Bay south to Hollister, bordered by the Diablo Range on the east and the Santa Cruz Mountains and the Gabilan Range on the west. Current site elevation is 247 feet above mean sea level (msl).

The proposed power plant site and an adjacent construction laydown area will be constructed on prime agricultural land, the majority of which is in active cultivation. The remaining area is occupied by several structures, and is used for grazing and storage. After the completion of the MEC, it is expected that the construction laydown area will be returned to agricultural production.

Santa Clara Valley generally experiences dry summers with moderate to high temperatures and cool nights. Winters tend to be wet with moderate temperatures. Annual average rainfall is about 14 inches (based on 121 years of recorded data with ranges from 4.8 to more than 30 inches) with more than 80 percent of the precipitation occurring between November and March (DWR 1980; SCVWD 1997). The applicant has identified the 25-year, 24-hour duration storm to produce 1.96 inches of rain, the 50-year recurrence, 24-hour duration storm to produce 2.21 inches of rain and the 100-year, 24-hour duration storm to produce 2.46 inches of rain (Calpine/Bechtel 1999a, Table 8.14-6).

SOILS

Soils in the location of the project consist of sands, gravels and finer grained sediment that were deposited as alluvium by Coyote Creek, and to some degree its tributary, Fisher Creek. Predominate soil types in the alluvial fan deposits are Los Robles clay loam, Yolo silty clay loam and Sunnyvale silty clay. At the distal edges of the fan in the northern part of the Coyote Valley, finer-grained sediments are found overlain with clayey soils (Calpine/Bechtel 1999a, p. 8.14.1). This region of the Coyote Valley is referred to as the Leguna Seca and, prior to the installation of a drainage system, was subjected to periodic flooding.

Several soil mapping units will be encountered in the construction of this project, most derived from sedimentary alluvium, most in excess of 5 feet to bedrock (Calpine/Bechtel 1999a, 2000b). At the proposed plant site, two soil mapping units are present. Approximately half of the site is Sunnyvale silty clay characterized as poorly drained clay that has a low permeability. Slopes for this soil mapping unit range from 0 to 2 percent and have an erosion hazard rating of none to slight. The

other half of the site is Yolo silty clay loam characterized as well-drained clay that has moderate permeability. This soil has slopes in the same range as the Sunnyvale soil and the same erosion hazard rating.

A 200-foot, 230 kV transmission line will be strung between the power plant's switchyard to PG&E's existing system with no additional structures required. Soils along this route include the Sunnyvale silty clay and Montara rocky clay loam. Montara rocky clay loam is shallow (approximately one foot to bedrock), excessively drained soil with moderately rapid permeability. Slopes encountered with this soil will be between 15 and 50 percent and are rated moderate to high for erosion hazard. The route for the proposed wastewater discharge line and one of the water supply lines consists of Sunnyvale silty clay and Clear Lake clay. Clear Lake clay is somewhat poorly-drained with slow permeability. The slopes and erosion hazard for Clear Lake clay are the same as for Sunnyvale silty clay. The route proposed for the groundwater supply line to San Jose MUNI Well 23 will encounter entirely Yolo silty clay loam.

Several natural gas pipeline routes are proposed to connect the MEC plant to PG&E's existing line just east of U.S. 101. Major soil mapping units likely to be encountered along these proposed routes include Montara rocky clay loam, Yolo silty clay loam, Riverwash, Cropley clay, Los Robles clay loam, Cortina very gravelly loam, San Benito clay loam, Climara clay and Maxwell clay. Riverwash is made up of loose sand, gravel and cobblestone. It is subject to movement by water flows and has excessive drainage. Cropley clay is well drained with slow permeability, slopes between zero and two percent and a none to slight erosion hazard rating. Los Robles clay loam is well drained with moderately slow permeability, slopes between two and nine percent and an erosion hazard rating of slight to moderate. Cortina very gravelly loam drains somewhat excessively, has rapid permeability, slopes between zero and five percent, and a "none to slight" erosion hazard. San Benito clay loam drains well, has moderately slow permeability with slopes between 30 and 50 percent and a high erosion hazard rating. Climara clay drains well, has slow permeability, slopes between 15 and 50 percent and has a high erosion hazard. Maxwell clay is moderately well drained, has slow permeability, slopes between two and five percent and has an erosion hazard rating of "none to slight". Maxwell clay, Climara clay and Montara rocky clay loam as classified as non-prime agricultural land.

The preferred route for the recycled water supply line is the SBWR Route. The majority of the route will encounter Yolo silty clay loam, Campbell silty clay and Zamora clay loam. Campbell silty clay is somewhat poorly drained with moderately slow permeability. Slopes are less than one percent and the erosion hazard is none to slight. Zamora clay loam is well drained with moderately slow permeability. Slopes are zero to two percent and the erosion hazard is none to slight. Because this route is located in an area that is mostly developed, these soils have already experienced disturbance.

For a complete list of the soil types and their characteristics, please refer to section 8.9.1.7 of the AFC and in Supplement A, Figures 3.9-1a and 1b.

SURFACE WATER

Adjacent to the proposed power plant site are two creeks. Fisher Creek forms the north and west boundary of the proposed site and is a tributary to Coyote Creek. Fisher Creek empties into Coyote Creek just north east of the proposed plant site. Coyote Creek flows north approximately 38 miles to the San Francisco Bay. This creek is described as both a "gaining" and a "losing" creek. At points along its route and depending on the season, Coyote Creek recharges groundwater through percolation (losses) and/or is recharged by groundwater (gains). The total watershed area for the creeks is 15 square miles. Regional Water Quality Control Board designated beneficial uses for Coyote Creek include wildlife habitat, species preservation and recreation (SFBRWQCB 1995; Calpine/Bechtel 1999a, p. 8.14.2). No specific beneficial uses are designated for Fisher Creek. Small earthen levees separate the site and Fisher Creek. As pointed out by the Santa Clara Valley Water District (SCVWD), the existing levees do not provide adequate flood protection to the site (SCVWD 1999b).

GROUNDWATER

Santa Clara Valley is underlain by the Santa Clara Valley Groundwater Basin. This basin is divided into three, hydraulically connected subbasins. The Santa Clara Valley Subbasin, with a surface area of 225 square miles (22 miles long and 15 miles wide), extends from the Coyote Narrows to the County's northern boundary. SCVWD estimates operational capacity of this subbasin to be 250,000 acre-feet a year, up from Department of Water Resources' (DWR) 1980 estimates of 157,000 acre-feet a year. At the Coyote Narrows (identified as a cascade), groundwater flows from Coyote Valley Subbasin north to Santa Clara Valley Subbasin (Iwamura 1995; DWR 1980). Coyote Valley Subbasin extends from the Coyote Narrows south to Cochran Road with a surface area of approximately 15 square miles (7 miles long by 2 miles wide). Although SCVWD has not yet determined an annual operational capacity, DWR (1980) estimated the annual safe yield of the subbasin at 10,600 acre-feet. Separated by a topographic divide, Coyote Valley Subbasin also flows into Llagas Subbasin to the south. The Llagas Subbasin runs from Cochran Road to the County's southern boundary, approximately 15 miles long and 3 miles wide, covering a surface area of approximately 74 square miles. In 1980, DWR estimated the safe yield of Llagas Subbasin to be 68,700 acre-feet a year and since then, SCVWD has increased this to an operational capacity of 150,000 acre-feet (Iwamura 1995; DWR 1980).

COYOTE VALLEY BASIN

Non-water bearing consolidated bedrock formations comprise the mountainous areas and the basement boundaries of the basins. Alluvium washed in from the surrounding mountainous areas and constitutes the water-bearing formations of Santa Clara and Coyote Valleys. Alluvium and Santa Clara formation represent a section of interbedded sand, gravel, clayey gravel, silt and clay overlain by younger alluvium comprising the water bearing formation. Maximum depth of the alluvium ranges from about 500 feet near the topographic boundary to about 150 feet at the north end near the Coyote Narrows. Coyote Valley Basin is essentially unconfined and laterally bounded on its eastside by the Santa Clara Formation and on its

westside by the bedrock of the Santa Cruz Mountains. Groundwater moves in a north-westerly direction down the Valley toward Coyote Narrows and discharges into Coyote Creek. Groundwater quality information is provided in **Soils & Water Resources Table 1**. Regional Water Quality Control Board designated beneficial uses for Coyote Valley subbasin are not differentiated from those of Santa Clara Valley Basin. For these basins the designated beneficial uses include municipal and domestic, industrial process and industrial service, and agricultural water supplies (SFBRWQCB 1995).

Coyote Creek enters the Valley floor from the eastside of Diablo Ridge (near the topographic boundary with Llagas Basin). The MEC site is located in what used to be called the Laguna Seca area of the Coyote Valley. Prior to the installation of a drainage system, groundwater at Laguna Seca would naturally rise and discharge to the surface as a result of the rising bedrock and the narrowing of the basin (Iwamura 1995, DWR 1980).

As of 1995, total annual groundwater extraction of the Coyote Valley Basin was estimated at 10.7 million gallons a day (mgd) or 12,000 acre-feet/year (Calpine/Bechtel 1999a, p.8.14-11). Recharge is by surface water percolation, rainfall, irrigation returns, runoff from bedrock uplands and subsurface inflows from bedrock basin boundaries (Iwamura 1995; Calpine/Bechtel 1999a, p. 8.14.11-12). In their data response WR-141, the applicant estimated that as much as 5,000 acre-feet or 1,630 mgy is transferred through the Narrows to the north basin (Calpine/Bechtel 1999l). According to the local authorities and recent studies of the basins, it is believed that additional pumping of groundwater in the Coyote Valley Basin can occur (Iwamura 1995), however, it is not known how much more can safely be withdrawn.

SANTA CLARA VALLEY WATER DISTRICT

As the water resource management agency for Santa Clara County, the Santa Clara Valley Water District (SCVWD) provides water supply (local and imported) and flood control services. SCVWD operates a system of reservoirs, canals, pipelines, groundwater basin recharge facilities, treatment plants, and distribution facilities to serve approximately 1.5 million people. Local water supplies are contained in the District's 10 reservoirs or within underground basins. Estimated total storage capacity of the reservoirs is about 170,000 acre-feet (SCVWD 1997). Yearly average surface flows that can be captured and diverted to the district's reservoirs, treatment plants or to the groundwater basins is about 101,000 acre-feet. This is reduced to approximately 59,000 acre-feet in critically dry years. Natural recharge to the basin adds another 112,000 acre-feet on average, reduced to 74,000 acre-feet in critically dry years (SCVWD 1997; SCVWD 1999; see also http://www.scvwd.dst.ca.us).

SOILS & WATER RESOURCES TABLE 1
Coyote Valley Basin Groundwater Quality*
(all units mg/L unless specified)

	Concentrations	
Constituents	**Minimum**	**Maximum**
Inorganics		
Alkalinity (total)	182	270
Aluminum	< 0.005	0.05
Arsenic	< 0.001	< 0.001
Barium	0.099	0.13
Cadmium	< 0.0005	< 0.0005
Calcium	38	118
Chlorides	13	50
Copper	0.0014	0.05
Fluorides	0.12	0.14
Iron, dissolved	0.019	0.1
Lead	< 0.002	0.012
Magnesium	23	41
Manganese	< 0.02	< 0.02
Mercury	< 0.0005	< 0.0005
Nickel	< 0.002	0.01
Nitrates	14.5	98
Potassium	0.89	1.47
Selenium	< 0.001	< 0.001
Sodium	21	37
Sulfates	30	62
Zinc	< 0.05	0.05
Other		
Ph	7.1 std units	7.9 std units
Hardness as CaCO3	214	304
Conductivity	470 umhos/cm	711 umhos/cm
Temperature	17 C	19 C
Color	< 0.1 units	5 units
Turbidity	0.09 NTU	5.5 NTU
TDS	290	461

Source: Calpine/Bechtel 1999l, Table WR-144-2.
* Data were available for four wells SCVWD sampled in 1999 and San Jose MUNIs 1987 sampling of its three test wells and the 1999 sampling of its active production well (one of the test wells).

Historically, overdrafting of the Santa Clara Valley Basin has resulted in subsidence around San Jose. As a result, SCVWD began importing water supplies from the State Water Project (SWP) and the federal Central Valley Project (CVP) under long-term contracts (DWR 1980; County 1994, pg. H-7; SCVWD 1997). As specified in their Integrated Water Resource Plan, SCVWD's SWP contract allows for 100,000 acre-feet per year and on average receives 74,000 acre-feet per year. CVP average yearly deliveries are approximately 125,000 acre-feet per year (the contract allows for 152,500 acre-feet per year). During critical dry periods these deliveries can drop to 47,000 acre-feet and 110,000 acre-feet, respectively (SCVWD 1997).

SCVWD provides wholesale water to 13 municipal and private water retailers in the County. Current water demand served by the SCVWD ranges from 350,000 to

390,000 acre-feet per year (SCVWD 2000). During the last major drought period (1987-1992), available water supplies could not meet Santa Clara County water demand (SCVWD 1997; also http://www.scvwd.dst.ca.us/hottopic/iwrpexsm.htm). By 2020, the District expects water demand could reach as much as 500,000 acre-feet per year. In the event that no further actions are taken by the district to expand available water resources, the District predicts that a water shortfall of 100,000 acre-feet could occur (SCVWD 1997).

The district has identified strategies that can be implemented to ensure adequate supplies are available to meet demand even in critical dry periods. Included in this strategy is the expanded use of recycled water to supplement water supplies (SCVWD 1997). In addition, the District has identified a need to improve groundwater modeling and enhance management practices as part of the Groundwater Management Plan (SCVWD 1999).

Two water retailers, San Jose Municipal Water System and Great Oaks Water Company, provide water service to Coyote Valley customers.

SAN JOSE MUNICIPAL WATER SYSTEM DIVISION

The San Jose Municipal Water System Division (San Jose MUNI) now services four different areas in the City of San Jose: North San Jose/Alviso, Evergreen, Edenvale, and Coyote. These service areas comprise about 10% of the City's population and 33.3 square miles. The annual water production is 6,142 million gallons (approximately 19,000 acre-feet) with a maximum daily production of 34.4 million gallons. While San Jose MUNI service territory is only 12% of the City's total land area, it represents 39% of the City's developable lands (see http://www.sjmuniwater.com/aboutus.htm).

In 1986, the San Jose MUNI installed three water supply wells (Wells 21-23) to draw water from the Coyote Valley Basin. These wells are located approximately 400 feet apart from each other, upgradient from the MEC site and just west of the railroad, and 400 feet north of Bailey Road. Each well is about 270 feet deep with well two screen intervals of 90 feet to 150 feet and 170 feet to 250 feet below grade (Calpine/Bechtel 1999c). The wells were designed for an individual capacity of 2,000 gpm. The capacity of each well was tested when the other wells were not in operation (Calpine/Bechtel 1999a, p. 7-6). Capacity of the wells under simultaneous operation is not known and may be less than 6,000 gpm. Only Well 23 is operational today at a rate of 300 mgd and the other two are capped. This groundwater currently is used for irrigation purposes (Calpine/Bechtel 1999a, p.8.14-2).

Two San Jose MUNI water supply lines are located in proximity of the MEC site. An 18-inch line is on the east side of Santa Teresa Boulevard and a 12-inch diameter pipeline is on the west side.

GREAT OAKS WATER COMPANY

Great Oaks Water Company is an investor owned utility under the jurisdiction of the California Public Utilities Commission. A potable water retailer in the San Jose

area, Great Oaks Water Company obtains most of their resources through SCVWD, but also owns and operates facilities of their own including deep wells throughout San Jose. Its customer base is primarily residential (about 70 percent) with a mix of industrial, commercial and public agencies making up the remainder (30 percent). Current demand is between 11,000 and 12,000 acre-feet a year.

According to Dan Stockton, Great Oaks Water Company provides only potable water service at this time. At the March 2000 staff workshop, Mr. Stockton stated that the company is not currently a retailer for recycled water, nor does the company control any facilities necessary to convey recycled water to their customers. Based on information received from Mr. Stockton and Randy Shipes with the City of San Jose, Great Oaks Water Company would need to obtain the rights to retail recycled water from the city and install additional infrastructure to get recycled water to their customers (CEC 2000 _, 3/22/00 workshop).

SAN JOSE/SANTA CLARA WATER POLLUTION CONTROL PLANT

The San Jose/Santa Clara Water Pollution Control Plant (WPCP) treats wastewater from San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Monte Sereno and Saratoga, serving an area of over 300 square miles (see also http://www.ci.san-jose.ca.us/esd/wpcp.htm). Operated by the City of San Jose as the lead agency of a joint powers authority, WPCP serves more than 1.3 million residents and 16,000 businesses.

Plant treatment capacity is 167 mgd and the 1998 annual mean effluent flow into Artesian Slough, tributary to Coyote Creek and South San Francisco Bay, was 134 mgd (SJ 1999c; Calpine/Bechtel 1999h: WR-114C – City of San Jose Annual 1998 Self-Monitoring Report, January 19, 1999). According to the City, the WPCP has less than 25 mgd available capacity for its entire service territory and only 12.31 mgd treatment capacity is available to new discharges in San Jose. Based on approvals given as of March 1999 by the City to new development, 5.75 mgd of additional flow for treatment will be going to WPCP (SJ 1999a, p. 20).

Pursuant to the Regional Water Quality Control Board's Order 98-052, discharges by the WPCP to the south San Francisco Bay are limited to less than 120 mgd average dry effluent flow. This discharge limit has been imposed to protect habitats of two endangered species, the California clapper rail and the salt marsh harvest mouse. To lower its discharge amounts, the WPCP has undertaken conservation efforts, environmental enhancements, and the delivery of disinfected, tertiary-treated, recycled water which meets California's Title 22 standards through the operation of the South Bay Water Recycling Program (SBWR) (SJ 1999; SJ 1999a, p.20).

SOUTH BAY WATER RECYCLING

South Bay Water Recycling Program is operated by the City for the San Jose/Santa Clara Water Pollution Control Plant and provides disinfected tertiary-treated water for appropriate non-potable uses (primarily irrigation and industrial uses). The recycling water product meets California's Title 22 requirements (for more information on these requirements, please see the **Public Health** section of this

PSA). The recycled water quality requirements that must be maintained by the SBWR are stipulated in RWQCB Order 95-117 and are described in the South Bay Water Recycling Operations Manual (revised January 2, 1998). With its existing system, the SBWR is capable of delivering up to 40 mgd of "unrestricted quality" reclaimed water for irrigation and industrial uses. As of June 1999, the SBWR had a recycled water usage of 7 mgd. **Soils & Water Resources Table 2** provides information on the quality of SBWR's recycling water product.

At this time, SBWR facilities do not extend as far south as Coyote Valley. A portion of the SBWR supply network follows Senter Road near Capital Expressway in San Jose. North of the expressway, the pipeline is 42 inches in diameter and south of the expressway it is 30-inches in diameter. The applicant is proposing to interconnect into the 42-inch line above the terminus. The City has indicated that if appropriate infrastructure can be put in place to make recycled water available to Coyote Valley, adequate capacity exists to serve MEC (Calpine/Bechtel 1999h: WR-115A; SJ 1999b). Requirements exist for the planning, constructing and operating a recycled water system for both new and existing development. Site-specific requirements may be set forth in the Recycled Water Use Permit (SJ 1999).

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC

Calpine/Bechtel are proposing the MEC be located on approximately 20 acres at the southern base of Tulare Hill in South San Jose. A temporary construction laydown area approximately 16 acres is also proposed just south of the power plant site. A one-mile natural gas pipeline and a 900 foot, 2 lane access road will be constructed to serve the project (Calpine/Bechtel 1999a; 1999e; 2000b). More than 15 soil types potentially will be affected by the project and these are discussed in the AFC, pages 8.9-3 to 8.9-7 and in Supplement A, Table 3.9-2 and Figures 3.9-1a and 1b. Approximately 10 acres of the site will be covered with impervious surfaces and the remaining area within the fence line will be vegetated (Calpine Bechtel 1999q, WR–212; BR–156). For a more detailed discussion of the proposed project, please see the **Project Description** section of this PSA.

SOILS & WATER RESOURCES TABLE 2
Estimated SBWR Recycled Water Quality

Constituents	Concentration
Cations (total as CaCO3)	633 mg/L
Calcium	50.7
Magnesium	29.5
Sodium	166.4
Potassium	14.7
Iron (dissolved)	0.1
Manganese	0.1
Ammonia (as NH4)	1.1
Anions (total as CaCO3)	633 mg/L
Sulfate	120
Chloride	209
Fluoride	0.1
Nitrate (as NO3)	58.9
Phosphate	5.5
Alkalinity (as CaCO3)	157
Metals	mg/L
Arsenic	0.0014
Barium	0.010
Berylium	0.001
Boron	0.5
Cadmium	0.001
Chromium	0.0008
Copper	0.0042
Lead	0.0011
Mercury	0.00009
Nickel	0.0077
Silver	0.001
Selenium	0.001
Thallium	0.001
Zinc	0.049
Other	
TOC	6.7 mg/L
Turbidity	NTU
Silica (dissolved)	22 mg/L
TDS	782 mg/L
TSS	1.1 mg/L
Setteable Solids	0.0
BOD	2.7 mg/L
Oil & Grease	1.7 mg/L
PH	7.2 std units

Source: Calpine/Bechtel 1999a, Table 8.14-3 based on SBWR data for March 1994 to August 1998.

As proposed, three water systems will be required to serve the MEC: recycled water system for cooling purposes; a potable water system for process, domestic and back-up water needs; and an industrial wastewater discharge system for all plant wastewater streams (Calpin/Bechtel 1999a, 1999e, 2000b). **Soils and Water Resources Table 3** provides Calpine/Bechtel's estimates for the volumes of water required by MEC. Chemical treatment of the water will be required prior to use in the MEC processes. This treatment will include the addition of conditioners (sulfuric acid, phosphate and sodium hypochlorite) to reduce corrosion and control mineral scaling and biofouling (Calpine/Bechtel 1999a, Section 2.2.7.2). (For a discussion of hazardous materials to be used at the MEC, please see the **Hazardous Materials Management** section of this PSA). Major linear facilities needed for these systems include a 10-mile recycled water supply pipeline, short lateral pipelines for the industrial wastewater discharge line and domestic water lines. In addition, a demineralized water storage tank will hold approximately 153,000 gallons of water representing a 24-hour supply. The applicant proposes a storage tank that will contain approximately 240,000 gallons of fire service water and 30,000 gallons of plant service water.

Fire water storage (240,000 gallons) represents approximately 2 hours of fire protection in the event of fire at the plant. Normally, the city requires a 4,500 gpm for 4-hour event protection (June 25, 1999 Janis Moore Memo). To augment on-site storage and satisfy this requirement, the applicant is proposing to obtain back-up emergency fire water from Great Oaks Water Company (Calpine/Bechtel 2000_, WR-237, 1/11/00). It is unclear at this time if this arrangement will satisfy the City's requirements. If it does not, larger on-site facilities may be required.

In the AFC Supplement A, the applicant proposes to place a portion of the recycled water supply pipeline and possibly the two other water system pipelines in a single corridor. Three separate trenches, each approximately five feet deep and four feet wide, will run along the south side of Fisher Creek from the MEC site to utilities located in Santa Teresa Boulevard, west of the site. Approximately 0.8 miles in length, the applicant has identified this corridor as Segment B-3 (Calpine/Bechtel 1999e). San Jose has specified that these pipelines must be no less that 10 feet apart (SJ 1999a). As a result, the applicant anticipates this corridor to be at most 66 feet wide (Calpine/Bechtel 1999e, pg. 2-2). At Santa Teresa Boulevard, the recycled water supply line will travel north through predominately residential neighborhoods to the SBWR mainline near Senter Road and Capital Expressway. For a more detailed description of the recycled water supply line route, designated SBWR route, please see AFC Supplement A (1999e). Other proposed water supply pipelines include a 1.25-mile, 24-inch pipeline along the western portion of the railroad right-of-way from the MEC to San Jose MUNI Well 23 near Bailey Road and a pipeline from the MEC site to Great Oaks Water Company's system located in Santa Teresa Boulevard.

SOILS & WATER RESOURCES TABLE 3
Estimated Water Demand for the MEC

Project Element	Water Type	Quantity* AFC
Peak Operating Conditions - 90 Degrees F, 5 Cycles of Concentration		
Cooling Towers	Recycled	3,094 gpm/4.5 mgd (4.7 mgd)**
Industrial Processes and Domestic Uses		
Steam Cycle Make-up		223 gpm
Evaporative Cooling		105 gpm
Oil/Water Separator		10 gpm
Domestic		2 gpm
Total	Potable	350 gpm/0.5 mgd (0.7 mgd)**
Average Operating Conditions - 60 Degrees F, 5 Cycles of Concentration		
Cooling Towers	Recycled	1,953 gpm/2.8 mgd (3.3 mgd)**
Industrial Processes and Domestic Uses		
Steam Cycle Make-up		49 gpm
Evaporative Cooling		24 gpm
Oil/Water Separator		10 gpm
Domestic		2 gpm
Total	Potable	85 gpm/0.1 mgd (0.2 mgd)**

* Source: Calpine/Bechtel 1999a, Tables 7.1-1 & Table 7.2-1; 1999q, WR 212 (5 cycles only). Other estimates of water use include that contained in a December letter to Dan Stockton from Calpine/Bechtel which was included in the Data Responses Set 4A (1/11/00), MEC stated their water supply needs as: Domestic/ Noncooling Industrial Uses Peak = 0.5 mgd; Average = 0.2 mgd; Cooling Towers Peak = 4.5 mgd; Average = 3.3 mgd; Total Water needs are 5.0 mgd peak and 3.5 mgd average.

** At the March 2000 staff workshop, Ken Abreu (Calpine) updated the expected water usage of the MEC. Estimated average usage of recycled water is 3.3 mgd (2,292 gpm) and a peak of 4.7 mgd (3,264 gpm).

EROSION CONTROL AND STORMWATER MANAGEMENT

Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the proposed project. Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Construction and maintenance-related erosion is of particular concern in areas of steep slopes and sandy soils. Increasing the amount of impervious surfaces will increase the amount of runoff and peak discharges from a development. Rainfall can greatly enhances the potential for water erosion. Grading activities may redirect runoff into areas more vulnerable to erosion. Areas where linear facilities cross drainages or steep sloped terrain are also vulnerable to erosion.

Soils that will be affected by the proposed project range in the rated susceptibility to erosion from none to high (Calpine/Bechtel 1999a; 1999e). Please note, once the vegetation is striped away, soil susceptibility to erosion will no longer be “none”. Calpine/Bechtel revised their proposed recycled water supply line in Supplement A and B. Their current redesign of the power plant and related facilities is discussed in their Supplement C. As described in Supplement C, the applicant has reconfigured the plant and placed the stormwater detention pond in the southwest corner of the site outside of the 100-foot riparian corridor setback area per the direction of the City of San Jose (Calpine/Bechtel 1999e, p. 3-15). In addition, as required by SCVWD, the discharge pipe will be undergrounded through the levee (rather than an open swale as originally proposed, Calpine/Bechtel 1999e, p. 3-25). Once the protective cover of vegetation is removed and the structure of the surface soil has been altered, however, all of these soils can be highly vulnerable to erosion.

Site preparation will include excavation, grading, removal of vegetation and storage and disposal of various materials. The site will be filled to provide a level area for the power plant at an elevation of 255 feet above mean sea level. Currently staff does not known how much soil from the site will be excavated or how much fill will be needed to reach this elevation, nor does staff know where the applicant proposes to obtain this volume of soil. Vegetation and topsoil from the power plant site will be removed and disposed. Soils will likely need to be imported to elevate the site. Some vegetation removal and earth moving activities will likely be needed for the construction laydown area. Slopes for perimeter embankments will be sloped to 3:1 (horizontal:vertical) and those near the detention basin will be 4:1 (Calpine/Bechtel 2000_ PDZ). Surface materials to be used at the site will include concrete, asphalt and or gravel. Graded surfaces will have a mild slope of about one percent resulting in surface runoff flowing toward the southwest of the site to the detention pond (Calpine/Bechtel 1999q, Data Response BR 159; Calpine/Bechtel 2000_, PDZ Sheets).

New temporary and permanent disturbances will occur as a result of constructing and operating the new linear facilities. Connecting the site to Monterey Highway, the two-lane road will be cleared and graded. The road will be approximately 32 feet wide and covered with an asphalt/concrete mix. The 200-foot, 230 kV transmission line will be strung between the power plant’s switchyard to PG&E’s existing system with no additional structures required. Minimal soil disturbance is expected during the installation of this line.

Recycled water will be delivered to the power plant via a new underground, 10-mile connection to SBWR’s 42-inch supply main located in Senter Road near Capital Expressway. The majority of this route is along existing roadways through residential and business districts. As proposed, the natural gas line will be buried. Directional drilling will be used to place the natural gas pipeline below roads, drainages and creeks along the chosen route. Actions will need to be taken to minimize impacts associated with soil disturbance during the construction and maintenance any of the linear facilities for this project, particularly in hilly, steep sloped areas.

As proposed, stormwater will be discharged to Fisher Creek via a pipe tunneled through the levee separating the creek from the site. Construction of the stormwater discharge structure to Fisher Creek, which is considered under the Clean Water Act as a Waters of the United States, will require a Nationwide Permit Number 7 from the U.S. Army Corp of Engineers and a 401 certification from the RWQCB. The applicant is preparing materials necessary for these permits and approvals. Staff has requested that the applicant submit copies of these applications, but at this time, no documents have been submitted to the Commission for staff's review (CEC March 22, 2000 Workshop). In addition, a Streambed Alteration Agreement will be required from the California Department of Fish and Game. It is possible the construction of the other linear facilities may fail under these requirements as well. These permits and their requirements are discussed in more detail in the **Biological Resources** section of this PSA and will be discussed further in the Final Staff Assessment (FSA).

During project operation, wind and water action can continue to erode unprotected surfaces. An increase in the amount of impervious surfaces can increase runoff, leading to the erosion of unprotected surfaces. The applicant will be required to obtain National Pollution Discharge Elimination System permits for both construction and operation of the MEC, which include requirements for the development and implementation of a Stormwater Pollution Prevention Plan. Calpine/Bechtel developed a draft Erosion Control and Stormwater Management Plan as well as a Stormwater Pollution Prevention and Monitoring Plan for the originally proposed plant (Calpine/Bechtel 1999q, BR 157, BR-159). Project changes have occurred since these draft plans were submitted to the Commission and they are no longer current. These plans need to be updated to reflect the new plant design and specifically identify the needed temporary and permanent erosion and stormwater runoff control measures for MEC that may be required.

STORMWATER DISCHARGE

A system of ditches, culverts, catch basins and maintenance holes will convey stormwater to an unlined stormwater detention basin located in the southwestern corner of the site adjacent to fisher creek. The detention basin will discharge directly to Fisher Creek via a pipe tunneled through the creeks levee (Calpine/Bechtel 2000b). SCVWD has specified that the stormwater detention pond will need to be sized and operated to accommodate the increased site runoff due to impervious surfaces (10 acres) to ensure that no induced flooding of Coyote Creek occurs (SCVWD 1999a). Please refer to the **Facility Design** and **Geology and Paleontology** sections of this PSA for more discussion on flooding issues.

As proposed, this basin will be sized to provide protection against the 25-year, 24-hour storm event, but to date, the exact dimensions have not been determined. The applicant has identified that the 25-year, 24-hour duration storm will produce 1.96 inches of rain or 530,789 gallons of run-off from a 10-acre site. (The 50-year recurrence, 24-hour duration storm will produce 2.21 inches of rain or 600,022 gallons and the 100-year, 24-hour duration storm will produce 2.46 inches of rain or 667,898 gallons of run-off from a 10-acre site (Calpine/Bechtel 1999a, Table 8.14-6).) The overflow will be directed to drain into Fisher Creek. Staff requested that

Calpine/Bechtel provide estimates of the water quality of the stormwater discharge to Fisher Creek and to provide an estimate of the water quality of the creek itself (CEC 1999a, Data Request 148). To date, no information has been submitted.

In addition, the applicant proposes to revegetate the side slopes (including the grade between the cooling towers and the setback area) of the site to prevent erosion. The cooling tower pad will be graded away from the riparian corridor. The adequacy of these stormwater management measures will be discussed in the Final Staff Assessment.

WATER SUPPLY

Most of the water used by MEC will be for cooling purposes. Calpine/Bechtel propose to use South Bay Water Recycling (SBWR) program recycled water for cooling tower make-up. At the March 2000 staff workshop, Ken Abreu (Calpine) updated the expected water usage of the MEC. Estimated average usage of recycled water is 3.3 mgd (2,292 gpm) and a peak of 4.7 mgd (3,264 gpm) or approximately 3,696 acre-feet a year to 5,264 acre-feet a year of recycled water. Under a tentative agreement, SBWR has indicated that as much as 5 mgd of disinfected, tertiary treated recycled water can be supplied to MEC (SJ 1999a; SJ 1999b). Based on the applicant's calculations, a 20-inch diameter pipeline will be able to deliver 3,300 gpm (Calpine/Bechtel 1999e, Montgomery Watson Memo, May 3, 1999). No recycled water storage facilities are proposed (Calpine/Becthel 2000aa, WR 237).

Currently, Calpine/Bechtel propose to use local groundwater supplied by either San Jose MUNI or Great Oaks Water Company for their process (steam cycle) and domestic water needs (Calpine/Bechtel 1999a; Calpine/Bechtel 1999h, Data Response WR-134; Calpine/Bechtel 1999l, Calpine/Bechtel, set 4A). The applicant is no longer considering the installation of on-site wells (Calpine/Bechtel 2000b). Potable water requirements for the MEC are estimated at 0.2 mgd (139 gpm) on average with a peak usage of 0.69 mgd (479 gpm) (CEC March 22, 2000 workshop, AFC estimates are different) or approximately 224 acre-feet a year to 773 acre-feet a year. In the event, that recycled water service is interrupted, Calpine/Bechtel are proposing the use of potable water from these local groundwater sources as back-up (Calpine/Bechtel 1999a, 2000a; CEC March 22, 2000 workshop).

At this time, the applicant has not yet decided on the water purveyor. Calpine/Bechtel is still in negotiations to determine the retailer of the water supply and suggested that only one water supplier will be used for all water needs of the MEC. Currently, San Jose MUNI is the only licensed purveyor of SBWR recycled water in the area. Mr. Stockton (Great Oaks Water Company) stated that the company is interested in being a retailer of recycled water but has not yet pursued the necessary approvals (CEC March 22, 2000 workshop). Contractual issues must be resolved prior to a decision on the purveyor.

BACK-UP WATER SUPPLIES

Currently, Calpine/Bechtel has proposed to use groundwater supplied from either San Jose MUNI or Great Oaks Water Company as the source of back-up water to

the MEC for cooling. Back-up water supply needs for potable water were confirmed to be a maximum of four weeks per occurrence (no maximum number of occurrences per year have been specified). It has been suggested in data responses and supplemental information submitted to the Commission that San Jose MUNI Wells 21-23 (Coyote Basin) or new wells (location unknown) built by Great Oaks may be constructed to supply this water. Mr. Stockton stated that Great Oaks Water Company currently has water lines north of Tulare Hill that will need to be extended to serve the project and to ensure adequate capacity, additional wells may need to be constructed (CEC 3/22/00 workshop). To date, the applicant's proposed back-up water supply is not well defined and inadequate information exists to show there will be no adverse environmental impacts associated with providing this service from Coyote Valley Basin groundwater sources.

In terms of the use of San Jose MUNI wells, the applicant was requested to perform pump tests and aquifer testing to determine if these wells can provided the needed water supply and determine what potential effects may occur (CEC 1999a, Data Request 135, CEC 1999_, Data Request 236). In their response, the applicant stated that such tests would not be performed until such time as the preferred water retailer is chosen. Since that time, both Great Oaks Water Company and San Jose MUNI have indicated that additional wells will be needed to serve back-up water requirements of the MEC (CEC 3/22/00 workshop). The location and characteristics of these new wells has yet to be defined. As a result, no analysis can be done on the potential to adversely affect other wells in the area, the creeks or whether the basin can safely yield this additional demand.

According to the SCVWD, the County has adequate groundwater resources in the county to serve the short-term emergency needs of MEC in the event that recycled water is not available (SCVWD, letter to Paul Richins, Dec. 2, 1999). In its subsequent letter to the Commission, the SCVWD stated that a groundwater study of the potential impacts associated with supplying the MEC with back-up water from groundwater supplies is not warranted. This position is based on an assessment that "the expected one-month emergency demand for the proposed project would only amount to approximately 6 percent of the 1999" groundwater demand in Coyote Valley (SCVWD, 4/14/00). SCVWD's assessment considers the entire county's resources and is based only on current demand for water. It did not take into consideration other proposed development within the North Coyote Valley that is proposing to obtain needed supplies from the Coyote Valley Basin. Staff concurs that the District possesses adequate water resources within the county to serve the MEC. However, the current proposal for back-up water supplies is to utilize groundwater from the Coyote Valley Basin obtained from the San Jose MUNI wells (21-23) or new wells that will be constructed by Great Oaks Municipal Water District (Calpine/Bechtel 2000aa, WR-236). The proposed Coyote Valley Research Park also wants to use these San Jose MUNI wells to serve its expected water demands. Current information on the capacity of the San Jose MUNI wells does not support their use, without modification, to safely yield the necessary volumes of water to serve as a back-up water source to MEC.

Staff is not yet convinced that providing this service from the Coyote Valley Basin will not result in any adverse impacts within the vicinity. The San Jose area has

been subject to overdraft of groundwater that has resulted in considerable subsidence problems (DWR 1980, SCVWD 1997, SJ 1999a). Information staff has reviewed shows that more water is being extracted (12,000 acre-feet by the applicant) than has been identified as the safe yield (10,600 acre-feet by DWR 1980). It is staff's position that a groundwater study of the Coyote Valley Basin is, in fact, warranted in light of the proposed new developments that seek to use groundwater from the Coyote Valley Basin. Only after the applicant has determined the preferred water purveyor and determined the additional infrastructure components to their project, will the needed study be conducted. At this time however, staff can not determine that the project's potential adverse impacts are properly mitigated.

To complicate matters further, if it is determined that the use of groundwater in the vicinity of the project is not viable, changes to the project may be required, including alternate pipelines to access other resources. In addition, the City of San Jose has stated that off-site storage facilities for reclaimed water may be constructed along the SBWR route to ensure an adequate and reliable supply of reclaimed water to the project. It has been recommended that if these facilities are needed for the project, that they be in excess of 400,000 gallons. If these facilities are required, Calpine/Bechtel will need to identify the location, size and potential environmental impacts of constructing these needed facilities.

WASTEWATER DISCHARGE

As described in data response WR-212, the applicant proposes to recycle both the reverse osmosis concentrate and the heat recovery steam generator (HRSG) boiler blowdown to the cooling towers. Originally, only the HRSG blowdown was to be recycled. In addition, the cooling system will be operated at five cycles of concentration, not three. According to the applicant, this current proposed water use plan results in a reduction of the wastewater flow from 1.8 mgd to 0.61 mgd average daily flow (Calpine/Bechtel 1999q). Prior to discharge of the cooling tower blowdown, other plant wastewater will be combined with it, including sanitary sewage and process wastewater (Calpine/Bechtel 2000b). All wastewater from the MEC will be discharged directly into the City's sanitary sewer line located in Santa Teresa Boulevard via a 0.8 mile, 12-inch forced main. This connection eliminates the need for an on-site packaged sewage system and holding tank as originally proposed (Calpine/Bechtel 1999a; Calpine/Bechtel 1999e; Calpine/Bechtel 1999h, Data Response WR 128).

In a July 16, 1999 letter to Calpine, the City indicated that it had adequate capacity to accommodate sewage discharge from the proposed power plant (specified as 1.9 mgd peak for 3 cycles of concentration and 0.6 mgd average flow for 5 cycles) (Calpine/Bechtel 1999h, Data Response WR-128). Estimated quality of the MEC wastewater discharge is shown in **Soils and Water Resources Table 4**.

In the AFC, Calpine/Bechtel indicated that the addition of chemical treatment (sulfuric acid, phosphate and sodium hypochlorite) to the recycled water would be necessary to reduce corrosion and control mineral scaling and biofouling (Calpine/Bechtel 1999a, section 2.2.7.2). In staff's data request No. 126, the

applicant was requested to revise their calculations of wastewater discharge concentration to account for these treatment chemicals. Although the applicant indicated that this information would be provided, it has not to date (Calpine/Bechtel 1999h, WR 126). The applicant indicated at the March 2000 staff workshop that the discharge will not result in any increase of net mass loading of pollutants in WPCP's discharge to the South Bay. Staff's data request seeks to verify that no increase will occur.

Analysis conducted by the City of San Jose and Calpine/Bechtel on the original estimated wastewater discharge concentrations showed that the MEC discharge will result in a three percent increase in the salinity (TDS) levels of the SBWR product recycled water. San Jose has requested that this impact be mitigated because it will adversely affect the marketability of the recycled water particularly to irrigation customers and may result in an increase in the salinity of groundwater (CEC 3/22/00). In the March 22 workshop, Mr. Shipes with the City confirmed that any increase in the salinity of the SBWR's product recycled water would be significant and that no increase in salinity is acceptable. The MEC is expected to increase the salinity of the SBWR recycled water product by 3 percent (Calpine/Bechtel 1999e). Based on information from the City, an increase of even one percent will adversely affect the marketability of the recycled water product and potentially increase groundwater salinity in the region (the result of the use of recycled water for irrigation of crops in the recharge areas of the basin, according to SCVWD).

SOILS & WATER RESOURCES TABLE 4
Estimated MEC Wastewater Discharge Quality

Constituents	Discharge Concentration	Allowable Concentration
Cations (total as CaCO3)	3037 mg/L	
Calcium	254	
Magnesium	146	
Sodium	780	
Potassium	63	
Iron (dissolved)	0.428	
Manganese	0.465	35.0
Ammonia (as NH4)	4.78	
Anions (total as CaCO3)	3036 mg/L	
Sulfate	1100	
Chloride	996	
Fluoride	0.514	
Nitrate (as NO3)	258	
Phosphate	24	
Alkalinity (as CaCO3)	239	
Metals	mg/L	mg/L
Arsenic	0.007	1.0
Barium	0.154	
Berylium	0.0005	0.75
Boron	2.133	
Cadmium	0.005	0.7
Chromium	0.011	1.0
Copper	0.02	2.7
Lead	0.005	0.4
Mercury	0.0006	0.01
Nickel	0.034	2.6
Silver	0.005	0.7
Selenium	0.008	2.0
Thallium	0.005	
Zinc	0.412	2.6
Other		
Silica (dissolved)	106 mg/L	
TDS	4029 mg/L	
TSS	<30 mg/L	
Setteable Solids	0.0 mg/L	
BOD	<30 mg/L	
Oil & Grease	<10 mg/L	
PH	6-9 std units	

Source: Calpine/Bechtel 1999a, Table 8.14-3.
* Data is based on peak operation (1.05 mgd discharge), 5 cycles of concentration for the cooling tower blowdown, 3 cycles of concentration for the evaporative cooler blowdown, and SCVWD groundwater resources.

Calpine/Bechtel summarized several options to reduce the impacts of the MEC wastewater discharge on recycled water salinity in their January 4, 2000 letter to Eric Rosenblum. However, the applicant concludes that the benefits from the use of recycled water by MEC outweigh the impacts to the SBWR product recycled water and recommends no mitigation. Staff agrees that benefits can be gained by the use of recycled water at the power plant, but disagrees that this justifies the degradation of recycled water quality that could preclude use by others as asserted by the city. Thus, based on this information, staff concludes that the project as currently proposed has the potential for a significant, unmitigated impact to the water quality of the SBWR's product recycled water.

NITROGEN DEPOSITION FROM PLANT OPERATION

In response to concerns raised by the SCVWD, the community and Energy Commission staff, Calpine/Bechtel analyzed the potential for increases in nitrogen levels in local water bodies as a result of plant operation. Two wells in an agricultural area south of the proposed MEC have shown elevated concentrations of nitrate. This analysis was part of a larger study on the potential for nitrogen loading of surrounding serpentine soils from the proposed plant's NOx emissions (Calpine/Bechtel 2000). These soils are important habitat for the Bay checkerspot butterfly, an endangered species. The study concludes that the project may result in some nitrogen deposition to serpentine soils and that impacts on local water bodies are insignificant. For more discussion on the impacts to serpentine areas, please refer to the **Biological Resources** section of this PSA. Staff has not completed its evaluation of potential impacts on the nitrogen levels of local water bodies (both surface and ground water) in the vicinity of the project. This analysis will be provided in the FSA.

CUMULATIVE IMPACTS

Several projects are being proposed in San Jose within the vicinity of the MEC. These projects include the Coyote Valley Research Park, several residential developments, manufacturing facilities, and research and development facilities. At this time, only the CVRP development is considered in this cumulative impacts analysis. To the extent that additional information on the specific water demands and wastewater discharge characteristics of these other development can be obtained, further analysis will be included in the Final Staff Assessment.

In February 2000, the City of San Jose issued their draft Environmental Impact Report (DEIR) on the proposed Coyote Valley Research Park (CVRP) (SJ 2000). A 688-acre campus industrial development, the CVRP will be developed over several years and is expected to employ approximately 20,000 employees. Included in the proposal is a 3.6 million gallon water reservoir and associated water facilities, an approximately 269-acre flood control basin and open space area, and relocation of a portion of Fisher Creek. Although the CVRP project is not at this time proposing to use reclaimed water, the project will include a reclaimed water distribution system for eventual use of reclaimed water for landscape irrigation. It is located in the 1,444-acre North Coyote Valley Campus Industrial Area that, at build-out, is expected to employ more than 50,000 people.

In their DEIR on the CVRP, San Jose estimated the water demand for development in Coyote Valley to be 3,000 gpd per acre. Although the CVRP is a total of 688 acres, the City used 400 acres to estimate the total water consumption of the development. Based on these estimates, the CVRP will consume approximately 1,344 acre-feet of water a year and generate approximately 900,000 gpd of wastewater.

As proposed, the water needs of the CVRP will be supplied by three existing San Jose MUNI wells (wells 21-23) and a new standby well located north of Bailey Avenue and west of the railroad tracks and Monterey Highway (SJ 2000, Vol. 1, p. 24). The existing wells are the same wells that Calpine/Bechtel proposes to use to supply potable water to the MEC. Water will be pumped from these wells and stored in the reservoir to serve the needs of the CVRP.

As part of a hydrogeologic evaluation conducted for the City by Geoconsultants, Inc., estimates of the available groundwater were developed (SJ 2000, Vol. 3, Appendix I). According to this evaluation, total available groundwater in the Coyote Basin is 1,867 acre-feet a year. CVRP's estimated consumption of 1,344 acre-feet per year represents 72 percent of the total available. As part of an earlier study, Geoconsultants, Inc. determined that groundwater extraction of 6,500 to 14,500 acre-feet a year from the basin would result in a lowering of the water level in the aquifer at the site by five feet. In the DEIR San Jose states, "sufficient water is available to serve the Project and build-out of North Coyote Valley Campus Industrial Area." Although not currently available, the City states that they expect the recycled water to be available to CVRP by 2006 (SJ 2000, Vol. 1, p. 188) to help lower the demands placed on potable water supplies. It was determined in the DEIR that this water demand on its own would have an insignificant impact.

Information staff has analyzed on the Coyote Valley Basin groundwater availability is not consistent with the findings presented in the City's DEIR. At this time, staff believes that additional analysis needs to be done to determine the safe yield of the Coyote Valley Basin considering the significant development expected in the area that will rely on this resource. SCVWD, at staff's March 22, 2000 workshop stressed that the water demand of the CVRP be included in any analysis of the capacity of the Coyote groundwater basin. Both projects are proposing to use the same wells and extract water from the same basin (CEC March 22, 2000 Workshop). Staff concurs. Staff also suggests that any expected project that will depend on the Coyote Valley Basin for water be included in a groundwater or water balance analysis.

As is described in the DEIR, the San Jose/Santa Clara Water Pollution Control Plant (WPCP) has a capacity of 167 mgd and processed approximately 142 mgd of effluent in November 1998. City of San Jose allocated capacity is 106.39 mgd and the City utilized 94 mgd of this capacity as of November 1998 (SJ 2000, Vol. 1, p. 186-188). As discussed earlier, the WPCP is limited under their NPDES permit to an effluent discharge flow rate to the Bay of 120 mgd. The expected wastewater flow of approximately 900,000 gallons per day represents a one percent increase in the City's existing peak weekly wastewater flow and will utilize more than 15 percent of the city's remaining share of capacity at the WPCP. This discharge is considered

in the draft EIR to be significant and the City suggests that by implementing the use of recycled water for irrigation (when such water becomes available in the Coyote Valley) will reduce this impact to less than significant (SJ 2000, Vol. 1, p. 189).

In the discussion of cumulative impacts, the City states that MEC's 3 to 5.8 mgd water demand "is equal to more than two-thirds of the entire supply capacity needed to serve the 1,444 acre North Coyote Valley Campus Industrial area (SJ 2000, Vol. 1, p. 200). However, staff did not find any specific estimate in the DEIR for the water demand of the area at build-out. Nor did staff find any discussion of the potential impacts of the CVRP and the MEC in terms of any of the expected Coyote Valley Urban Reserve, long term development that will result in as many as 25,000 new housing units.

The City determined that there are insufficient resources to serve both the MEC and the CVRP from groundwater resources. Of particular note is that MEC proposes to use recycled water for the vast majority of their normal water needs, not potable water. Groundwater will only be used for non-cooling industrial processes, domestic requirements, and for back-up on an emergency basis for cooling purposes. With only an estimated 523 acre-feet of water a year available after the construction of the CVRP, it is likely that there is insufficient groundwater resources to serve the remaining 756 acres of the North Coyote industrial development (this is based on the City's estimate of 3,000 gpd per acre water requirements).

FACILITY CLOSURE

A planned, unexpected temporary or permanent closure of the proposed MEC 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 MEC to address this concern in their closure plan.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The proposed project will be required to obtain a Recycled Water Use Permit and the Industrial Waste Discharge Permit from the City of San Jose. Discharge limits established by the City will ensure that the project does not result in a violation of the WPCP's NPDES limitations. Use of recycled water for cooling purposes is consistent with the SWRCB's policy 75-58.

Permits required for construction of the detention basin outfall to Fisher Creek include a Streambed Alteration Agreement from the Department of Fish and Game, a U.S. Army Corp of Engineers Nationwide Permit 7 and a water quality certification (Section 404). The applicant stated that they are pursuing these permits and that drafts should be submitted to the Commission prior to the FSA (CEC March 22, 2000 Workshop). For further discussion of the project's compliance with the

Streambed Alteration Agreement and the Nationwide Permit, please see the **Biological Resources** section of this PSA.

MITIGATION

EROSION AND SEDIMENTATION

In response to a staff data request, MEC provided a draft Erosion Control and Revegetation Plan that identifies temporary and permanent erosion and sedimentation control measures (Calpine/Bechtel 1999q, Data Response BR-155, revisions to WR-147). Calpine/Bechtel also submitted a draft Stormwater Pollution Prevention Plan (SWPPP) that identifies the stormwater conveyance system and monitoring program (Calpine/Bechtel 1999q, Data Response BR 156, revisions to WR-149). Since that time, the applicant has changed their project (please see AFC Supplement C, Calpine/Bechtel 2000b). These plans will need to be revised to reflect the new project proposal and incorporate necessary measures as specified in the Streambed Alteration Agreement, Nationwide Permit and 401 certification. When finalized, this plan will serve as the SWPPP as required under the General Construction Stormwater Permit issued by the State Water Resources Control Board.

The final plans will identify the best management practices that will be implemented at the site to prevent loss of soil and prevent erosion-related pollution. These practices will involve both temporary and permanent structures. A number of potential best management practices for the construction and operation phases of the project are listed below.

BEST MANAGEMENT PRACTICES THAT REDUCE EROSION AND SEDIMENT-LADEN STORMWATER RUNOFF

- Cover disturbed soils with mulch. This may be used in combination with temporary or permanent seeding strategies.
- Direct runoff away from disturbed areas by means of temporary drainage ways.
- Stabilize plant site roadways with compaction or gravel.
- Utilize soil stabilizers (most commonly water) on disturbed areas as appropriate and as required in Air Quality conditions.
- Utilize straw bale barriers to intercept sediment-laden runoff from small areas of disturbed soil.
- Create straw check dams to reduce erosion of existing drainage channels and to promote sedimentation behind the dam.
- Place silt fencing to promote sedimentation behind silt fence.
- Create stormwater retention basins to retain runoff and allow excessive sediment to settle out.
- Inspect temporary erosion control devices during construction in accordance with the Final Plan schedule.

- Insure replacement of damaged or missing structures.
- Notify project construction crew when to implement adequate precautions in anticipation of poor weather conditions.
- Dictate appropriate wetness when watering a road for dust suppression.
- Develop remedial erosion controls for problem areas, if any.
- Complying with applicable codes.
- Protect stockpiled soil with water-resistant tarps; protect stockpiles from runoff with hay bales or silt fencing, or suppress dust with water.
- Install temporary slope breakers (water bars or berms) at the portion of the pipeline that crosses grades steep enough to require such measures in order to divert water off the construction right-of-way and to reduce velocities.
- Slope breakers will be installed at spacing recommended by the Bureau of Land Management or Natural Resources Conservation Service.
- Slope breakers may be constructed from soil, silt fences, or stalked hay or straw bales.
- Straw bale barriers and/or check dams will be inspected and replaced or repaired as needed. Accumulated sediment will be removed when it reaches a depth of 6 inches.
- Sandbags placed along the toes of slopes and at linear facility structures will be inspected. Sediment will be removed after each significant storm event and deposited in a stable area not subject to erosion.
- If sediment accumulates over 1 foot behind the (sandbag) barrier, the contractor will remove or re-grade the sediment.
- Mulched areas will be examined for damage or deterioration and reapplied as necessary.
- Protected storage areas for stockpiled soils or other materials will be inspected. Tarps or other coverings will be replaced and secured.
- Depending on the season, slope breakers will be inspected in areas of active equipment or within 24 hours of each 0.5-inch of rainfall.
- Slope breakers will be maintained until revegetation measures are successful or the area is stabilized.

BEST MANAGEMENT PRACTICES TO PREVENT STORMWATER CONTAMINATION

Provide secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of fluid materials from contaminating soil or soaking into the ground.

Cover dumpsters and waste containers.

- Designate storage areas for construction wastes.
- Provide for proper storage of hazardous materials, paints, and related products.

- Train employees on the proper use of materials such as fuel, oil, asphalt and concrete compounds, acids, glues, solvents, etc.
- Implement a spill prevention and control plan.
- Timely remove construction wastes.
- Store all liquid wastes in covered containers.
- Use portable toilet facilities managed by licensed contractor.

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 (please see the **Hazardous Materials Management** section of this PSA for more information). As generally described, containment structures (berms) will be built for hazardous material storage areas. The containment structure will be sized to hold the volume in the largest tank or container plus the volume of rainfall from a 25-year, 24-hour storm event. Areas in which more than one vessel is to be located will be designed to contain 150 percent of the volume from the largest tank (Calpine/Bechtel 1999q, Data Response BR-156). At this time, the site-specific spill prevention and contingency plan has not yet been submitted for staff review.

SITE DRAINAGE

The site drainage system will be designed to comply with all applicable federal, state, and local regulations. On-site drainage will be accomplished by gravity flow, whenever possible (Calpine/Bechtel 2000_, PDZ, February 2000). The surface drainage system will consist of mild slopes (greater than or equal to 1%) and open channels, catch basins and a drainage pipe system, sedimentation detention basin, swales and a vegetated ditch. Calpine/Bechtel have specified that site base elevation will be 255 feet above msl (Calpine/Bechtel 1999q) and the ground floor elevation of buildings and structures will be placed above the 100-year flood level of 247 feet. Design of the site drainage facilities will be performed in accordance with the City of San Jose and SCVWD requirements. The unlined stormwater detention basin will be sized for the 25 year, 24 hour storm event (1.96 inches of rain) WR-147 (8/23/99).

CEC STAFF PROPOSED MITIGATION

Without additional clarification of the proposed project, updated information on the potential impacts of the revised project and information on the specific mitigation measures the applicant proposes for the project, Energy Commission staff can not determine if these measures comply with applicable LORS. Staff is providing general conditions of certifications below that are intended to initiate discussion on the outstanding information, requirements and issues. Additional and or refined Conditions for Certification will be identified in the Final Staff Assessment.

CONCLUSIONS

As a result of staff assessment of the proposed Metcalf Energy Center, we find that the project has the potential for significant, unmitigated impacts, specifically to the recycled water quality of the SBWR program and to Coyote Valley Basin groundwater resources. Based on available information, staff concludes that without changes in the proposed project and additional information to identify potential impacts (including hydrologic analysis of the Coyote Valley Basin, data on new wells and source water data, and updated erosion and stormwater management plans), no additional mitigation measures can be proposed to lessen these affects. These project changes include the reduction of the salinity of the wastewater discharge and the identification of additional project components for the provision of back-up water supplies. If further analysis shows that use of groundwater for back-up water supplies results in adverse impacts, additional mitigation may be required. Staff does not recommend approval of the project as currently proposed.

CONDITIONS OF CERTIFICATION

SOILS&WATER 1: Disinfected, tertiary-treated, recycled water will be used at the Metcalf Energy Center for cooling purposes. Potable water may be used for cooling purposes not to exceed 30 days in any one year. The project owner will notify the CPM in writing if potable water is used for cooling purposes and provide an explanation of why the back-up supplies are being used.

Verification: Once construction of the MEC facility is complete, the project owner will provide the Energy Commission CPM in its annual compliance report, a record of the average monthly recycled water consumption used for cooling purposes, the average monthly groundwater and potable water used cooling purposes and other uses broken down by type and the average monthly water for each supply.

SOILS&WATER 2: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain Energy Commission staff approval for a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Stormwater Construction Activity Permit for the project.

Verification: Thirty days prior to the start of any clearing, grading or excavation activities associated with the construction of any project element, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval. Approval of the plan by the Energy Commission CPM must be received prior to the initiation of any clearing, grading or excavation activities associated with construction of any project element.

SOILS&WATER 3: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain staff approval for a final erosion control and revegetation plan that addresses all project elements. The final plan to be submitted for staff's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the Energy Commission CPM no later than thirty days prior to the scheduled construction start date. Approval of the final plan by the Energy Commission CPM must be received prior to the initiation of any clearing, grading or excavation activities associated with construction of any project element.

SOIL&WATER 4: No later than sixty days prior to commercial operation, the project owner, as required under the General Industrial Activity Storm Water Permit, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Approval for the final Industrial Activities SWPPP must be obtained from Energy Commission staff prior to commercial operation of the power plant.

Verification: Two weeks prior to the start of commercial operation, the project owner will submit to the Energy Commission CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP) prepared under requirements of the General Industrial Activity Storm Water Permit. The final plan shall contain all the elements of the draft plan with changes made to address staff comments and the final design of the project.

Soils&Water 5: Operation of the Metcalf Energy Center and the discharge of its wastewater to the San Jose sewer system will not contribute to any increase in mass loading of pollutants to the WPCP effluent or the degradation of the SBWR recycled water product.

Verification: The project owner will develop and implement a water quality monitoring program for the wastewater discharge of the MEC. Sampling of the wastewater discharge of the power plant will be conducted on a monthly basis. This data will be submitted to the Energy Commission in the project owner's monthly compliance reports. In the annual compliance reports, the project owner will submit to the Commission a summary of the annual average wastewater quality data and a confirmation letter from the WPCP confirming that the wastewater quality is within limitation specified in their wastewater discharge permit.

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GEOLOGY AND PALEONTOLOGY

Robert Anderson

INTRODUCTION

The geology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of the geology 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. 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 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

The applicable LORS are listed in the AFC, in Sections 8.14, 8.15 and 8.16 (Calpine/Bechtel 1999a). A brief description of the LORS for geological hazards and resources, paleontological resources, and drainage and erosion control follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The United States Bureau of Land Management (BLM) requires an excavation permit for excavations and grading on land under their jurisdiction. The MEC is not located on lands under the jurisdiction of the BLM. Therefore, there are no federal LORS with respect to geological hazards or resources, or paleontological resources, that are applicable to this 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 investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33) that includes supplemental standards specific to California. The CBC supplements their 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).

Santa Clara Valley Water District Ordinance No. 83-2 is a local ordinance that defines the limits of watercourses and the Santa Clara Valley Water District's jurisdiction over watercourse construction and management for the purposes of flood control. A Santa Clara Valley Water District permit is required for construction within 50 feet of the top of the bank of water courses throughout the county.

The City of San Jose Riparian Corridor Policy Study of May 17, 1994 (revised March 1999) includes guidelines for flood control, water quality and protection from construction. The guidelines for the riparian corridor are discussed in the **Soil and Water Resources** and the **Biology** sections of this document.

SETTING

The site is located in the northern portion of the Coyote Valley in Santa Clara County. The Diablo Range Mountains and the Santa Cruz Mountains bound the site to the east and west respectively. Site geology includes unconsolidated to semi-consolidated alluvium. Five soil units were encountered during the preliminary geotechnical investigation (Calpine/Becthel, AFC 1999a page 10G-5). The soil layers are differentiated by the relative percent of clay and gravels or sand and average standard penetration blow counts. Bedrock under the site is made of greenstone. Exposures of greenstone are seen on the nearby Tulare Hill. The region is extensively faulted and has a history of moderate to high seismicity (12 M_L (local magnitude) 6 or above earthquakes) (Calpine/Bechtel 1999a, AFC page 8.15-4). Fisher Creek drains the western side of Coyote Valley into Coyote Creek.

ANALYSIS AND IMPACTS

FAULTING AND SEISMICITY

No active faults are known to cross the proposed power plant footprint or the linear facilities. The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. There are four faults within twenty miles of the site that are considered active and have the potential to generate a moment magnitude (M_W) 7 or larger earthquake. The active fault closest

to the site is the Monte Vista-Shannon Fault. This fault is located approximately 1 mile west northwest of the site. The estimated peak horizontal ground acceleration associated with a M_W 7 earthquake on the fault is 0.5g.

In April 1984, a Richter Magnitude 6.2 earthquake occurred near the town of Morgan Hill. The epicenter of the earthquake was located approximately 10 miles northeast of the site. The 1984 Morgan Hill earthquake was associated with a zone of seismicity associated with the Calaveras fault. During the earthquake, the Metcalf Substation, which is located approximately 7 miles southwest from the epicenter sustained minor damage. The damage was limited to a failed circuit breaker, a lighting arrestor, and to electric control panels that were not secured to the building. The estimated peak horizontal ground acceleration at the Metcalf Substation was 0.4g (Schiff, 1985).

In October 1989 the M_W 7.1 Loma Prieta earthquake occurred 14 miles southwest of the project site. The Metcalf Substation was damaged in the Loma Prieta earthquake. The damage was limited to a 230 kV lighting arrestor, a disconnect switch, and three live tank circuit breakers (Benuska 1990, page 328). Five of the transformers associated with the live tank circuit breakers in the 500kV switchyard developed oil leaks.

A 10.2 mile long water supply line for the power plant has been proposed for the project. No active faults are known to cross the alignment of the proposed water supply line as depicted in the AFC supplement (Calpine/Bechtel 1999e, figures 2.1-1a and b MEC Site and Linear Facilities Location Map, dated September 29, 1999).

LIQUEFACTION, HYDROCOMPACTION, EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. Liquefaction usually is observed in the upper 100 feet beneath a site if it occurs at all. The depth to groundwater at the proposed power plant location is 12 feet below the existing ground surface. Staff have reviewed the boring logs provided by the applicant and find that certain areas of the power plant foot print may be susceptible to liquefaction using the applicant's own criteria of high ground acceleration (0.5g), high ground water elevation (12 feet below existing grade), and low standard penetration blow counts (0-16 blows per foot). Staff suggest that the site may be prone to liquefaction. A final geotechnical assessment of subsurface conditions should be conducted prior to designing the foundation of the power plant. (see Condition of Certification Geo 2.)

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the project site are partially saturated and dense and are not considered to be prone to hydrocompaction.

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. Near surface soils reported in the AFC (Calpine/Bechtel 1999a) are classified as silt, clay,

silty sand and poorly graded sands. None of the clayey soils tested had a high plasticity index (Calpine/Bechtel 1999a, Table 10G6-1); therefore the potential for soil expansion is low.

CORROSION

The pH of soil samples taken by the applicant range from 8.1 to 8.5 (alkaline soils). The applicant has not yet conducted any field electrical resistivity surveys. Lowney Associates 2000 has reported that soil samples taken at the nearby proposed Coyote Valley Research Park may have a moderate to severe potential for corrosion. The applicant has indicated on page 10G-3 of the AFC that they intend to conduct field electrical resisitivity surveys during the phase II field investigation. The phase II investigation is to be completed before final design of the proposed project.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

No geological resources have been identified at the site or along the electric transmission line alignments, the natural gas supply line, or the water supply and wastewater return lines. Energy Commission staff have reviewed the Paleontological Resources Technical Report (Calpine/ Bechtel 1999b). No paleontological resources are known to exist at the site or along the linear facilities. The proposed water supply line northern termination is not included in the above mentioned report; however, the applicant has indicated that no paleontological resources are known to exist along the proposed alignment. Energy Commission staff have worked in Santa Clara County and had not encountered paleontological resources in the vicinity of the proposed water supply pipeline. Energy Commission staff concur that paleontological resources have been encountered in alluvium in the Santa Clara Valley in the past, and that the paleontological sensitivity of the alluvium is high, but the probability of encountering paleontological resources along the proposed water supply pipeline is low. Energy Commission staff have proposed conditions of certification 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 site is located adjacent to a 100-year flood zone that follows the Fisher Creek drainage along the east and north sides of the site. The 100-year flood elevation adjacent to the site is 247 feet. Elevation of the footprint for the building and the top of the storm water basin areas vary from 253 to 257 feet above mean sea level. The footprint for the site has been relocated to the east and south of the existing embankment. Minimum grade for the power plant area will be 1% and all drainage will be directed away from buildings within the footprint. There is a break in an embankment located between the power plant footprint and Fisher Creek. The breach is located near the portion of the proposed power plant where the switchyard would be located. It is staff's understanding that the embankment was once a part of the Laguna Seca Reclamation District, which is now defunct, and the embankment is not maintained. Power plant spill containment features are described by the applicant to have a minimum of one foot of freeboard. Run-off

during a 100-year 24-hour storm event should not overwhelm the capacity of the proposed surface water drainage system.

The Santa Clara Valley Water District has jurisdiction over projects that are located within fifty feet of or encroach into Fisher Creek. On October 22, 1999, the Santa Clara Valley Water District wrote a letter to the Energy Commission (SCVWD 1999a) expressing their concerns with respect to surface water drainage. The Santa Clara Valley Water District has asked the applicant for a detailed hydrology analysis. The analysis will take into consideration the proposed Coyote Valley Research Park impact onto local drainage systems. The analysis from the applicant is to be received and reviewed by Energy Commission staff prior to issuing the final staff assessment for the project.

FACILITY CLOSURE

There are three kinds of facility closure. 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.

POTENTIAL IMPACTS

SITE SPECIFIC IMPACTS

The project is not likely to have any impact on geological or paleontological resources. The effects of the project on surface water drainage have not yet been demonstrated by the applicant. However, a detailed hydrology analysis from the applicant is to be received and reviewed by Energy Commission staff prior to issuing the final staff assessment for the project.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, and geologic hazards is unlikely if the MEC is constructed according to the proposed conditions of certification. This is based on the fact that the site is not known to have significant paleontological or geological resources. Cumulative impacts on surface water hydrology are not yet resolved since Energy Commission staff have not yet received the detailed hydrologic analysis. The impact of the proposed development of the Coyote Valley Research Park project next to the power plant with respect to drainage and flood control will be assessed by Energy Commission staff once the applicant submits to the SCVWD and the Energy Commission the detailed hydrologic analysis for the project. This analysis must be completed and submitted to the SCVWD and the

Energy Commission before the Energy Commission staff is able to make an assessment on potential drainage and flooding impacts.

MITIGATION

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 water and waste water pipelines. Energy Commission staff agree with the applicant that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related features.

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

The applicant will likely be able to comply with applicable LORS for geological hazards, resources and paleontological resources. The project should have no adverse impact with respect to geological and paleontological resources. The effects of the project on surface water hydrology, both specific and cumulative, are still unresolved to the satisfaction of the Santa Clara Valley Water District and Energy Commission staff. The applicant has indicated that they will respond to the Santa Clara Valley Water District's letter of October 22, 1999. Energy Commission staff propose to ensure compliance with applicable LORS for geological hazards, and geological and paleontological resources with the adoption of the proposed conditions of certification listed below. At this point compliance with LORS for surface water hydrology with respect to flooding and drainage has not been demonstrated by the applicant. Energy Commission staff can not recommend certification of the project until the applicant has demonstrated compliance with the LORS for surface water hydrology with respect to flooding and drainage.

PROPOSED CONDITIONS OF CERTIFICATION

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 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 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). 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).

GEO-2 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.

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, for the intended use, of the site 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 CPM and the CBO.

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 are not in concert with 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 written 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.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the Paleontological Resources Monitoring and Mitigation Plan 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 Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. 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

Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.

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SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontological Resources: Standard Procedures. October 1994.

The Habitat Restoration Group and Jones and Stokes Associates, Inc. 1999. Riparian Corridor Policy Study, City of San Jose. Pages 47-48. May 17, 1994 (revised March 1999).

FACILITY DESIGN

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INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design 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;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed 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;
- determine 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 or environmental protection; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and 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 discussed 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; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to protect environmental quality and assure public health and safety and comply with all applicable LORS.

SETTING

Calpine Corporation and Bechtel Enterprises (Calpine/Bechtel or the applicant) proposes to construct and operate the 600 megawatt Metcalf Energy Center (MEC) (Calpine/Bechtel 1999a, 1999e, 1999f, 2000a). The project will be located in Santa Clara County at the southern edge of the City of San Jose. For more information on the site and related project description, please see **Project Description**.

The site lies in seismic zone 4, the zone of greatest seismic shaking in the United States. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices 10A through 10G (Calpine/Bechtel 1999a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS for each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (Calpine/Bechtel 1999a, §§ 6.5, 7.3; Table 10.4-1; Appendices 10A through 10G).

ANALYSIS

The basis of this analysis is the applicant's proposed analysis and construction methods and list of LORS and design criteria set forth in the AFC.

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 Appendices 10A through 10G for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see 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, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC), and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) 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.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis 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.

PROJECT QUALITY PROCEDURES

The AFC (Calpine/Bechtel 1999a, § 2.4.5) describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a powerplant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

COMPLIANCE MONITORING

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 will invite the local building authority, either the City of San Jose or Santa Clara County, to act as CBO for the project. When an

entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegate agents.

Staff has developed proposed Conditions of Certification to ensure protection of the environment and public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant'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 in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities, which would be difficult to reverse or correct, may proceed without prior approval of plans by 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 bear 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

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 and restoration of the site. 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 for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans, and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed General Conditions (see General Conditions) to ensure that these measures are included in the Facility Closure Plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.

Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable LORS.

The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed 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 CBO or other Energy Commission delegate agent. Staff will audit the CBO to ensure satisfactory performance.

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.

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, the decommissioning procedure is likely to occur in compliance with all applicable LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to protect environmental quality, and assure public health and safety, and to ensure compliance with all applicable engineering LORS;

The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) 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.

Protocol: In the event that the initial engineering designs are 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 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 list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

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 Santa Clara County 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).]

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.

Protocol: 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.]

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.

Protocol: 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.

Protocol: 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.

Protocol: 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.]

Protocol: 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.

Protocol: 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.

Protocol: E: The electrical engineer shall:

16. Be responsible for the electrical design of the project; and

17. 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.

Protocol: The special inspector shall:

1. 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;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. 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

4. 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.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;

2. An erosion and sedimentation control plan;

3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. 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.

Protocol: 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:

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and

5. Switchyard structures.

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.

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;

2. 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];

3. 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

4. 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:

1. 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);

2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. 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

5. 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.

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.]

Protocol: 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.

Protocol: 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.]

Protocol: 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.]

Protocol: The following activities shall be reported in the Monthly Compliance Report:

- receipt or delay of major electrical equipment; and
- testing or energization of major electrical equipment.

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.]

Protocol: A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;
3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

Protocol: B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;

4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. 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

Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.

Calpine/Bechtel. 1999e. AFC Supplement A, October 1, 1999.

Calpine/Bechtel. 1999f. AFC Supplement B, October 15, 1999.

Calpine/Bechtel. 2000a. AFC Supplement C, February 15, 2000.

POWER PLANT RELIABILITY

Steve Baker

INTRODUCTION

In this analysis, 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.

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 Calpine/Bechtel has predicted a level of reliability for the power plant (see below), staff believes Calpine/Bechtel 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)

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.

SETTING

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 to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is only now 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 currently being considered 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 will 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 have become accustomed.

Calpine/Bechtel proposes to operate the Metcalf Energy Center (MEC) as a 600 MW baseload and load following unit operating at output levels from 30 to 100 percent of baseload at an overall annual availability factor between 92 and 98 percent (Calpine/Bechtel 1999a, AFC §§ 1.1, 2.1, 2.2.2, 2.4.1, 10.2.2). Calpine/Bechtel mentions no plans to sell reliability-related power services.

ANALYSIS

A reliable power plant is one that is available when called upon to operate. 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 MEC and compares them to industry norms. If they compare favorably, staff can conclude that the MEC will not degrade utility system reliability.

Throughout its intended life, the project will be expected to perform reliably in baseload and load following duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. This requirement for equipment availability is typically addressed by control of quality in machinery design, construction, and installation. Plant reliability is further assured by providing for plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards.

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 QA/QC program delineated by Calpine/Bechtel (Calpine/Bechtel 1999a, AFC §§ 2.4.5, 2.4.5.2) describes a program typical of the power industry. Equipment and supplies will be purchased from qualified suppliers, suppliers' QA/QC programs will be audited, and construction and installation will be inspected, all in accordance with the QA plan. 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 and load following 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.

Calpine/Bechtel plans to provide some redundancy of function (Calpine/Bechtel 1999a, AFC §§ 2.2.5.3, 2.2.13.3, 2.4.2, Table 2.4-1). For example:

The following plant components are provided in sets of two 100 percent capacity units:

— HRSG feedwater pumps (one per HRSG; a complete spare pump will be stored on-site);

— condensate pumps;
— closed cycle cooling water pumps;
— closed cycle cooling water heat exchangers;
— demineralizer/RO system; and
— battery chargers.

The circulating water pumps are provided in a set of two 60 percent capacity units:

The computerized control and protective system for the gas turbine generators and HRSGs, known as the Distributed Control and Information System (DCIS), will exhibit typical redundancy.

While some power plants may exhibit greater levels of equipment redundancy, the fact that the project consists of two parallel 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). With this opportunity for continued operation in the face of equipment failure, and in light of the fact that Calpine/Bechtel does not purport to sell system reliability services, staff believes that the equipment redundancy described here represents an adequate design approach for a project such as this.

MAINTENANCE PROGRAM

Calpine/Bechtel proposes to establish a plant maintenance program typical of the industry (Calpine/Bechtel 1999a, AFC §§ 2.4.1, 2.4.5.2). In conjunction with an overall plant quality control program (Calpine/Bechtel 1999a, AFC §§ 2.4.5, 2.4.5.2), staff expects that this will allow the project to 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 MEC will burn natural gas from a nearby PG&E backbone pipeline, transmitted to the plant via a new one-mile long, sixteen-inch diameter pipeline (Calpine/ Bechtel 1999a, AFC §§ 1.1, 2.1.6).

The PG&E natural gas system, which provides access to gas from the Northwest and the Southwest, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (Calpine/Bechtel 1999a, AFC § 2.4.3). Staff agrees with Calpine/Bechtel's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

WATER SUPPLY RELIABILITY

The MEC will obtain recycled water for cooling purposes from the South Bay Water Recycling (SBWR) Program via a new pipeline. From 20 to 35 percent of this water will be consumed in evaporation; the remainder will be returned in the form of wastewater through another new pipeline. Potable water for plant use, as well as for cooling water backup, will be supplied by the San Jose Municipal Water System via a third new pipeline, or alternatively will be drawn from new onsite groundwater

wells (Calpine/Bechtel 1999a, AFC §§ 1.1, 1.5.2, 2.1, 2.2.7, 2.2.7.2, 7; Calpine/ Bechtel 1999e, §§ 1.0, 1.1, 2.1, 2.2.3).

Using recycled water for plant cooling provides a benefit for the SBWR Program, consuming nearly two million gallons per day through evaporation (Calpine/Bechtel 1999a, AFC § 7.1). This is water that would otherwise have to be dumped into San Francisco Bay. Staff regards this arrangement as an adequately reliable supply. (Please refer to that portion of this document entitled **Soil and 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 that portion of this document entitled **Facility Design**).

FLOODING

Flooding should not present a serious threat to plant reliability, as the project site lies outside a 100-year flood zone (Calpine/Bechtel 1999a, AFC § 2.3.1). Proper site design and grading will provide adequate protection from flooding. These topics are covered under the **Geology** and **Facility Design** portions of this document.

SEISMIC SHAKING

The site lies within Seismic Zone 4. 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. (Please see that section of this document entitled **Facility Design**.) 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. 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 1993 through 1997 (NERC 1998):

For Combined Cycle units (All MW sizes)

Availability Factor = 91.10 percent

The Siemens-Westinghouse 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. Calpine/Bechtel's prediction of an annual availability factor from 92 to 98 percent (Calpine/Bechtel 1999a, AFC §§ 2.2.2, 2.2.2.16, 2.4.1) is not unreasonable 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 gas turbines that make up the NERC statistics. Further, since the plant will consist of two 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 (Calpine/Bechtel 1999a, AFC §§ 2.4.1, 2.4.5.2). This practice holds out the promise of adequately high plant availability. Calpine/Bechtel'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

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

Calpine/Bechtel predicts an equivalent availability factor from 92 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.

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POWER PLANT EFFICIENCY

Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Metcalf Energy Center (MEC) 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 MEC'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

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

Calpine/Bechtel proposes to construct and operate a (nominal) 600 MW combined cycle power plant to generate baseload and load-following power (Calpine/Bechtel 1999a, AFC §§ 2.2.16, 2.4.1, 9.5.1, 10.2.2). The MEC will consist of two Siemens-Westinghouse F-class combustion turbine generators with evaporative inlet air coolers and steam injection producing approximately 200 MW each, two heat recovery steam generators (HRSGs) with duct burners, and one 235 MW reheat steam turbine generator, totaling approximately 600 MW (Calpine/Bechtel 1999a, AFC §§ 1.1, 2.2.2, 2.2.3, 2.2.4.1, 2.2.4.2).

ANALYSIS

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 MEC will burn natural gas at a maximum rate exceeding 80 billion Btu per day (Calpine/Bechtel 1999a, AFC Fig. 2.2-4; Calpine/Bechtel 1999h, Data Response #40[1]). 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 peak load efficiency of approximately 52.3 percent LHV[2] (Calpine/Bechtel 1999a, AFC Fig. 2.2-4; Calpine/Bechtel 1999h, Data Response #40); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

Calpine/Bechtel has described its sources of supply of natural gas for the MEC (Calpine/Bechtel 1999a, AFC § 1.1, 2.1, 2.4.3, 6). The project will burn natural gas from a PG&E backbone pipeline that lies to the east of Highway 101. The existing PG&E gas supply infrastructure is extensive, offering access to gas from the

[1] Note: This data response erroneously reported a fuel consumption rate that was too low by a factor of 1,000.

[2] Lower heating value.

Northwest and Southwest. These sources represent far more gas than would be required for a project this size. It is therefore highly unlikely that the MEC 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 via a new one-mile long, 16-inch diameter pipeline from the existing PG&E backbone pipeline east of Highway 101 (Calpine/Bechtel 1999a, AFC § 2.1.6). The natural gas supply system in California is so large and well-established, there is no real likelihood that the MEC will require development of new sources of energy.

Compliance with Energy Standards

No standards apply to the efficiency of the MEC or other non-cogeneration projects.

Alternatives to Reduce Wasteful, Inefficient and Unnecessary Energy Consumption

The MEC 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 MEC will be configured as a compound-train combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust. 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 gas turbine. 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 duty. Loads down to 50 percent of full load allow one gas turbine, operating at full load, and the steam turbine to maintain peak efficiency.

Additionally, for further operational flexibility, the HRSGs will be equipped with duct burners, to supply additional steam to be injected into the gas turbines for power augmentation (Calpine/Bechtel 1999a, AFC §§ 2.2.2, 2.2.4). This increases

maximum power output, and extends the range of power outputs at which the plant can operate at optimum or near optimum 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 MEC represent some of the most modern and efficient such machines now available. Calpine/ Bechtel will employ a combined cycle power train from a prominent manufacturer, the Siemens-Westinghouse 501F, nominally rated in a two-on-one train combined cycle at 546 MW and 55.8 percent efficiency LHV at ISO[3] conditions (Calpine/ Bechtel 1999a, AFC § 2.2.4.1; GTW 1998).[4]

A possible alternative is the General Electric Frame 7FA, another F-class gas turbine nominally rated at 530 MW and 56.5 percent efficiency at ISO conditions in two-on-one train combined cycle configuration (GTW 1998). This machine is effectively identical to the machine chosen.

Another possible alternative is the ASEA Brown-Boveri KA-24, still another "F-class" machine. While the KA-24 promises slightly higher fuel efficiency (57.9 percent) (GTW 1998) 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 some advantage here.

Efficiency of Alternatives to the Project

The project objectives include generation of baseload or load following electricity, as market conditions dictate (Calpine/Bechtel 1999a, AFC §§ 2.2.16, 2.4.1, 9.5.1, 10.3).

Alternative Generating Technologies

Calpine/Bechtel addresses alternative generating technologies in its application (Calpine/Bechtel 1999a, AFC § 9.5). Oil-burning, coal-burning, nuclear, solar, wind, hydroelectric, biomass, ocean energy conversion, municipal solid waste, fuel cells and geothermal technologies are all considered. Given the project objectives, location and air pollution control requirements, staff agrees with Calpine/Bechtel that only natural gas-burning technologies are feasible.

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[3] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

[4] Nominal, or expected, maximum plant output of approximately 600 MW is greater than this figure, due to the incorporation of duct burners and steam injection.

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 best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is 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, 2.2 percent higher than the 501F, the G machine produces 367 MW to the 501F's 272 MW; a 600 MW power plant would thus not be practical. Instead, a single 501G would yield a 367 MW (nominal) plant, while a dual arrangement would yield a 726 MW plant. Additionally, the 501G is brand new; the first such machine is now in startup at a site in Florida owned by Lakeland Electric and Water (Power 1999). Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant will frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, Calpine/Bechtel's decision to purchase "F-class" machines is a reasonable one.

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 gas turbine power output by cooling the gas turbine inlet air. A 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 evaporative cooler boosts power output best on dry days; it uses less electric power than a chiller, thus yielding slightly higher operating efficiency. The difference in efficiency between these two techniques is so small as to be insignificant. Calpine/Bechtel plans to install evaporative cooling (Calpine/Bechtel 1999a, AFC § 2.2.4.1). Given project climate and the relative lack of clear superiority of one system over the other, staff deems this an approach that will yield no adverse energy impacts.

In conclusion, the project configuration (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 efficiency impacts when aggregated with the MEC.

FACILITY CLOSURE

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

CONCLUSIONS

The MEC, if constructed and operated as proposed, would generate 600 MW of electric power at an overall project fuel efficiency of approximately 52 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 MEC would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resource 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 MEC. No Conditions of Certification are proposed.

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TRANSMISSION SYSTEM ENGINEERING

Linda Davis and Al McCuen

INTRODUCTION

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 Calpine Corporation and Bechtel Enterprises, Inc. (Calpine/Bechtel), the applicant, proposes to connect their project, the Metcalf Energy Center Project (MEC) to Pacific Gas & Electric Company's (PG&E) 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 project," 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

- 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 provides 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 MEC will provide a maximum electrical output of 635 megawatts (MW). (Two 200 MW Combustion Turbine Generators and one 235 MW Steam Turbine Generator.) The site is at the southern edge of the City of San Jose in Santa Clara County, partially within the city limits. The MEC site is approximately 2,000 feet southwest of the PG&E Metcalf substation. (MEC 1999a, pages 2 and 3.)

The applicant plans to construct a 230 kilovolt (kV) (see **Definition of Terms**) switchyard and approximately 240 feet of an overhead double circuit 230 kV transmission line. The short new lines form a new loop-in of the existing PG&E Metcalf to Monta Vista No. 4, 230 kV transmission line into the new MEC switchyard. The new double circuit overhead line will exit the MEC switchyard, cross over a small area of the plant site, extend over Fisher Creek and tie into the existing transmission corridor through modification of the existing Metcalf to Monta Vista No. 4 transmission line. The loop will extend approximately 240 feet and tie into the existing line through modification of Tower 0/6, which is the most southern transmission tower in the existing corridor. (MEC 1999a, pages 5-1 and 5-4). No new right of way for the overhead segment will be purchased, as PG&E property and the MEC site are adjacent. (MEC 1999b, page 19.)

The MEC project will access the California market through PG&E's Metcalf to Monta Vista No. 4 transmission line. The Cal-ISO, after review of the Detailed Facilities Study[1], required Supplemental Studies to define parameters and potential impacts of the project not addressed in the Detailed Facilities Study. (Cal-ISO 1999). The project parameters did not change significantly as a result of the analysis of the Supplemental Studies. Cal-ISO and CEC staff concludes that no significant new downstream facilities are required to accommodate the MEC.

[1] A Detailed Facilities Study is the final interconnection study that includes all the pertinent information required by the Cal-ISO in order to grant interconnection to the Cal-ISO controlled grid. It also provides the cost to the applicant to interconnect to the grid within plus or minus ten percent.

PROJECT SWITCHYARD

The project switchyard will consist of one 230-13.8 kV power transformer and nine 230 kV circuit breakers. A breaker-and-half arrangement will be used to provide reliability. All switchyard equipment will be designed for a 63,000 amp interrupting capacity. The main busses and bays will be designed for 3,000 amp continuous current. (MEC 1999a, page 5-4).

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 short-circuit study was completed by PG&E in MEC's Detailed Facilities Study based on parameters provided by the applicant. The short circuit study results did not indicate any overstressed equipment (MEC 1999b, page 10). The acceptability of breaker ratings will be verified during the compliance phase of the certification process. Condition of certification **TSE-1b** will ensure compliance.

TRANSMISSION LINE CHARACTERISTICS

The proposed line will be a 230 kV double circuit line overhead extending 240 feet from the take off towers located inside the MEC switchyard to existing tower No.0/6 of the Metcalf to Monta Vista No. 4 line, which is located in the existing PG&E corridor adjacent to the site. The circuit functions as a loop and adds no additional transmission capacity to the Metcalf to Monta Vista circuit. The take off towers will be spaced approximately 50 feet apart. Each phase of the two three-phase lines will be made of bundled 2,300 kilo-circular-mills (KCM) all aluminum conductor (AAC), named "2300 AAC" which is a standard PG&E conductor that is presently installed for the Metcalf to Monta Vistas No. 4 transmission line, and therefore is required for the MEC loop. The normal rating for the bundled conductor at 230 kV is 1,106 mega-volt-amps (MVA) or about 1,083 megawatts (MW), assuming a 0.98 power factor. (MEC 1999b, page 19).
The new circuit will extend approximately 240 feet and tap into the existing line through reinforcement and modification of Tower 0/6. The existing double circuit tower support structure is 174 feet high. No new right of way for the overhead segment will be purchased. (MEC 199b, page19). This configuration of conductors and support structures is acceptable.

ALTERNATIVE TRANSMISSION LINE ROUTES

Four transmission alternatives were considered. Other than Alternative 1, Express Connection to Metcalf Substation, all route alternatives begin by exiting the MEC switchyard and accessing the transmission corridor to existing circuits in the corridor. (MEC 1999a pages 5-5 to 5-7).

ALTERNATIVE 1-EXPRESS CONNECTION TO THE METCALF SUBSTATION

This transmission alternative involves directly connecting three MEC step up transformers in the MEC switchyard to the 230 kV bus at the PG&E Metcalf substation. The connection would be made with high pressure fluid filled pipe-type underground cable system extending approximately 2,000 feet to connect each of

the three generator step up transformers to the 230 kV bus at the Metcalf substation. Modification of the Metcalf substation would include extension of the 230 kV bus and installation of three new 230 kV circuit breakers within the fence of the Metcalf substation. The underground circuits would exit the power plant site on the eastern side immediately adjacent to the MEC step up transformers and extend to the easy approximately 2,000 feet to an extended 230 kV bus in the Metcalf substation. This alternative requires directional drilling. The costs and environmental impacts of this alternative are considered to be higher than the proposed interconnection. (MEC 1999a, page 5-5).

ALTERNATIVE 2- INTERCONNECT TO THE EXISTING 500 KV TRANSMISSION LINE

This transmission alternative involves looping into the existing Metcalf to Moss Landing 500 kV transmission line. The major elements of this alternative are a new 500 kV double circuit transmission line, a 500 kV switchyard and 500 kV step up transformers. The loop would have to cross several 115-kV and 230 kV lines, decreasing reliability. Construction of 500 kV facilities is more costly than 230 kV construction. (MEC 1999a, page 5-6).

ALTERNATIVE 3- INTERCONNECT TO THE OTHER EXISTING 230 KV TRANSMISSION LINES

This transmission alternative involves looping into the existing 230 kV transmission lines in the same corridor as the Metcalf to Monta Vista No. 4 circuit by crossing under that circuit and others in the corridor. This might require underground cable systems or cross several 115 kV and 230 kV lines, decreasing reliability. (MEC 1999a, page 5-6).

ALTERNATIVE 4- INTERCONNECT TO THE EXISTING 115 KV TRANSMISSION LINES

This transmission alternative involves looping into the existing 115 kV transmission lines in the same corridor as the Metcalf to Monta Vista No. 4 circuit or by connecting directly to the 115 kV bus at Metcalf substation. This alternative would require relocation or crossing over of lines in the corridor increasing costs and decreasing reliability. (MEC 1999a, page 5-7).

EXISTING FACILITIES AND RELATED SYSTEMS

The map, Figure 1, illustrates existing electric facilities located near the MEC project site. Specific facilities in close proximity to the interconnection include:

- PG&E's Metcalf substation is located 0.5 miles northeast of the site. Metcalf substation is connected to the following PG&E lines: 500 kV Metcalf-Tesla and Metcalf-Moss Landing lines, the two Metcalf-Newark and two Metcalf-Moss Landing 230 kV lines, the four Metcalf-Monta Vista 230 kV lines, and two 115 kV lines each from Metcalf to El Patio, Edenvale, Newark and Evergreen and one 115 kV line each from Metcalf to Morgan Hill, Green Valley and the Coyote Pumping Plant.
- PG&E's transmission corridor is located adjacent to the north MEC site boundary. The lines in the corridor are the 500 kV Metcalf-Moss Landing, the four 230 kV Metcalf-Monta Vista lines and two 115 kV Metcalf-El Patio lines.

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, or 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 Cal-ISO has reviewed the Detailed Facilities Study and Supplemental Studies for the MEC project. Considering the comments of the ISO, CEC staff does not anticipate the need for any new major facilities beyond those identified to be located at the site, within the existing transmission corridor adjacent to the site, and those within the fence lines of the Metcalf and Monta Vista substations. The Cal-ISO review of the Detailed Facilities Study and the Supplemental Studies resulted in preliminary interconnection approval by the Cal-ISO. (Cal-ISO 2000a).

Overloads identified in the Supplemental Studies were characterized by the Cal-ISO as being attributable mainly to the power flows required to serve load in the area. Such overloads were noticed by the Cal-ISO to be minimally increased by the project power. The MEC may be asked to share some costs of improvements to address such overloads attributable to serving load, however these costs are expected to be minimal and environmental issues related to such facilities are not expected to be attributed to the MEC. CEC staff concludes that no significant additional new facilities are needed to accommodate the MEC. The Cal-ISO will give its final approval to the project after reviewing additional information requested by the Cal-ISO listed in Attachment A to the preliminary interconnection approval letter, referred to in this analysis as the Attachment A studies. (Cal-ISO 2000a).

Staff expects Calpine/Bechtel and the ISO to develop mitigation measures that will alleviate overloads identified as related to the MEC project. These measures are not expected to result in any new downstream facilities. The Cal-ISO will provide testimony on the Attachment A studies, the Supplemental Studies and the Detailed Facilities Study Report and will provide conclusions and findings in the Energy Commission's hearings.

Staff does not expect that as a result of the project any downstream facilities will be required by the Cal-ISO. The issuance of the Cal-ISO's final Interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. Condition of certification **TSE-1h** provides for Energy Commission review of the Cal-ISO final interconnection approval letter and the PG&E/applicant Facility Interconnection Agreement.

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 MEC 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.

Based on the Detailed Facility Studies and Supplemental Studies the Cal-ISO has granted preliminary approval to the interconnection (Cal-ISO 2000a). Additional studies (Attachment A studies) requested by the Cal-ISO are not expected to identify the need for any new transmission facilities beyond those discussed in this analysis and the MEC AFC. (Cal-ISO 2000a).

The PG&E Detailed Facilities Study Report and Supplemental Studies show that power delivered from the MEC project to the existing Metcalf substation will affect power flows on existing transmission lines in the region. Interconnecting through a loop-in of the Metcalf-Monta Vista 230 kV No. 4 circuit to PG&E’s electric grid results in the MEC project affecting flows on the line and at Metcalf substation. Power flow studies analyzed the affects of MEC for two cases (MEC 1999b, page 8) as follows:

18. PG&E’s Heavy summer 2002 base case
19. PG&E’s Summer off peak 2002 base case
20. Year 2002 South (San Francisco) Bay stress case

The power flow study results indicate that under most conditions all electric facilities would operate within their rated levels and voltages were within required ranges for the transmission interconnection. Emergency overloads occur on existing facilities when the loadings exceed 100% of their ratings due solely to the addition of the MEC output to the PG&E system. Single contingencies model the system assuming an element out of service, such as a line outage or transformer failure. Single contingencies were modeled with the MEC in service and out of service. No facility was found to exceed its emergency ratings with the addition of the MEC.

The 2002 Heavy Summer Peak base case analysis found no overloaded facility under either normal operating conditions or following single contingencies that are directly attributable to the MEC. The 2002 Off peak base case analysis found no overloaded facility directly attributable to the MEC under either normal operating conditions or following single contingency. Supplemental Studies suggest that some cost sharing for upgrades required to accommodate load growth may be appropriate, since the upgrades may be required sooner as a result of the MEC power flows. (Cal-ISO 2000a). Without the MEC at the Metcalf, site overloading of the 500/230 kV transformer at the Metcalf substation occurs under some emergency conditions. This overloading has been shown to be somewhat reduced by the MEC power flow under the conditions modeled in the studies. This reduction

in flows on the transformer may help defer the need for a second 500/230 kV transformer at the Metcalf substation. This would allow PG&E to defer the $20 million expenditure for the transformer (CEC 2000a). The deferral of the cost of the transformer would likely have no significant impact on rates paid by the consumers.

Study of the Delta Energy Center generation identified overloading of some circuits under normal and contingency operation for the 2002 Summer Peak. The Pittsburg-Tassajara 230 kV circuit is overloaded to 115%. Worst contingencies were the loss of the Tesla-Newark 230 kV line, resulting in overload of the Pittsburg-Tassajara 230 kV line to 108%; the outage of the Monta Vista 230/115 kV Transformer Bank No. 4, overloading the Monta Vista 230/115 kV Transformer Banks No. 1 and 2 to 125% and 112%; and the outage of the Evergreen 115/60 kV Transformer Bank overloading the Monta Vista 230/60 kV Transformer Bank No. 1 to 123%. More overloads were revealed for the Off Peak cases, however all overloads were reduced from the case showing only the Delta Energy Center in service with the MEC off-line. That is, the overloads that may be found to be attributable to the Delta Energy Center are somewhat reduced by the addition of the MEC to the system (MEC 1999b, p.8 and p 20).

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 short-circuit studies indicated that, when the MEC project is connected to the system, equipment such as circuit breakers were not overstressed at Metcalf, Monta Vista, or adjacent substations. The fault duty studies were based on parameters provided by Calpine/Bechtel. The results could be significantly different if the actual parameters differ substantially from the data used in the DFS. However, since circuit breaker replacement is considered a “within the fence” change for the project, the determination of actual parameters until after the Energy Commission’s decision on project certification is acceptable. Condition of certification **TSE-1b** has been written to assure that breakers comply with the Cal-ISO’s findings (MEC 1999b, page 10).

Based on the PG&E Detailed Facilities Study, the Supplemental Studies, and the comments and recommendations of the Cal-ISO, staff believes that the MEC project will be interconnected to the existing system in accordance with reliability criteria. Significant new or modified downstream facilities are not required. Based on the Detailed Facility Studies and Supplemental Studies, the Cal-ISO has granted preliminary approval to the interconnection (Cal-ISO 2000a). Additional studies (Attachment A studies) requested by the Cal-ISO are not expected to identify the need for any new transmission facilities beyond those discussed in this analysis and the MEC AFC. Conformance verification with reliability criteria and interconnection standards will be assessed in the Commission’s Compliance and Monitoring Process (see Conditions of Certification **TSE 1, 2 and 3**). Staff’s proposed conditions of certification require the studies performed in response to Attachment A of the preliminary approval letter and an executed Interconnection Agreement between MEC and PG&E. As a practical matter, staff anticipates that the studies performed in response to Attachment A of the preliminary approval letter and final interconnection approval by the Cal-ISO will be available near the end of the siting process.

ALTERNATIVES

This section addresses transmission alternatives studied for the proposed site. Alternative site analysis is presented in the **Alternatives** section of the staff assessment. Five different transmission line alternatives were considered for the Metcalf site. The four alternatives that were dropped include transmission alternatives one through four.

Alternative 1: This transmission alternative involves directly connecting three MEC step up transformers in the MEC switchyard to the 230 kV bus at the PG&E Metcalf substation. The costs and environmental impacts of this alternative are considered to be higher than the proposed interconnection. The applicant is no longer considering this alternative.

Alternative 2: This transmission alternative involves looping into the existing Metcalf to Moss Landing 500 kV transmission line. Construction of 500 kV facilities is more costly than 230 kV construction. The applicant is no longer considering this alternative.

Alternative 3: This transmission alternative involves looping into the existing 230 kV transmission lines in the same corridor as the Metcalf to Monta Vista No. 4 circuit by crossing under that circuit and others in the corridor. This might require underground cable systems or cross several 115 kV and 230 kV lines, decreasing reliability. The applicant is no longer considering this alternative.

Alternative 4: This transmission alternative involves looping into the existing 115 kV transmission lines in the same corridor as the Metcalf to Monta Vista No. 4 circuit or by connecting directly to the 115 kV bus at Metcalf substation. This alternative would require relocation or crossing over of lines in the corridor increasing costs and decreasing reliability. The applicant is no longer studying this alternative.

CUMULATIVE IMPACTS AND STSTEM BENEFITS

Several other generating projects in the area have been proposed. Delta Energy Center was modeled in the Detailed Facilities Study to determine general cumulative impacts, and new generation planned for Moss Landing has been the subject of study by the Cal-ISO. Studies performed for the Moss Landing interconnection indicate to staff that increasing the generation at Moss Landing can be expected to increase power flow on the 230 kV system, including the Metcalf – Moss Landing 230 kV lines (CEC 2000a). Including the Delta Energy Center with the MEC in the model resulted in overload of some circuits under normal and contingency operation. Overloads were reduced with both projects generating from the case showing only the Delta Energy Center in service with the MEC off-line. That is, the overloads that may be found to be attributable to the Delta Energy Center are somewhat reduced by the addition of the MEC to the system (MEC 1999b page 8 and page 20).

Significant transmission projects planned in the area are included in the “Northeast San Jose Transmission Reinforcement Project”. This project includes the proposed Los Esteros substation and associated new transmission and distribution lines,

including the new 230 kV circuit from Newark substation to the proposed Los Esteros substation. The project is needed to meet the projected electric demand in the area. That is, the new facilities are designed to alleviate overloads in the area occurring as a result of load growth. The new facilities will thus serve to reduce power flow on the 230 kV system (PG&E 1999). The project is expected to be completed by the time the MEC is operating. The Cal-ISO requested study of a delay in the implementation of the Northeast San Jose Transmission Project in the studies identified in Attachment A to the preliminary approval letter (Cal-ISO 2000a). Results of a delay of the transmission project will be reviewed by the Cal-ISO before the final interconnection approval letter is issued.

System benefits occur when a new generating source is shown to cause avoidance or deferral of investment in infrastructure that is required to meet reliability criteria. Negative benefits may occur if such a planned investment is required even sooner due to a project's power flow. Three instances are of significance for the MEC:

The Supplemental Studies suggest that some cost sharing for upgrades required to accommodate load growth may be appropriate, since the upgrades may be required sooner as a result of the MEC power flows (Cal-ISO 2000a). These costs are expected to be minor. No environmental responsibility would be attributed to the MEC. The acceleration of the cost of the improvements, if required, would have no significant impact on rates paid by the consumers

Without the MEC at the Metcalf site, overloading of the 500/230 kV transformer at Metcalf substation occurs under some emergency conditions. This overloading has been shown to be somewhat reduced by the MEC power flow under the conditions modeled in the studies. This reduction in flows on the transformer may help defer the need for a second 500/230 kV transformer at the Metcalf substation (CEC 2000a). This would allow PG&E to defer the $20 million expenditure for the transformer. The deferral of the cost of the transformer would have no significant impact on rates paid by the consumers.

Overloads were reduced by the MEC when power flows were compared to the case showing only the Delta Energy Center in service with the MEC off-line. That is, the overloads that may be found to be attributable to the Delta Energy Center are somewhat reduced by the addition of the MEC to the system (MEC 1999b, p.8 and p 20). Savings that may occur in the costs of transmission requirements for accommodating the DEC project as a result of the MEC may to result in slightly lower costs to the DEC.

Study of the impact of the new generation on system losses requires examination of power flows under operating conditions beyond the scope of this analysis. Studies that are performed to identify thermal overloads are not appropriate for analysis of changes in system losses. Thus a specific determination of the effect of new generation at Metcalf on the economic and environmental impacts of electrical power losses is beyond the scope of this analysis. Changes in system losses as a result of the project will be subject of Cal-ISO analysis and will be identified in the final interconnection agreement as

input into the determination of the total megawatts of capacity that the project will deliver to the system.

FACILITY CLOSURE

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 Midway substation) and general control over the interconnected generators. Prior to 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[2] and inspects the interconnection facilities. Contractual provisions may be developed to provide backup, or other power service, 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.” Condition of certification **TSE-1c** requires 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[3] 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

[2] 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.

[3] The PTO, in this instance, is PG&E, e.g., the system owner to which the project is interconnected.

power service via the outlet line to supply critical station service equipment or other loads.[4]

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).

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

CONCLUSIONS

CEC staff concludes that no significant additional new facilities are needed to accommodate the MEC. The Cal-ISO will give its final approval to the project after reviewing additional information requested by the Cal-ISO listed in Attachment A to the preliminary interconnection approval letter. The power plant switchyard, outlet lines, and terminations are acceptable assuming the conditions of certification are implemented. The CEC staff's preliminary findings indicate that reliability criteria will be met and downstream facilities will not be required for the interconnection of the MEC project to meet NERC, WSCC and Cal-ISO reliability criteria. The Cal-ISO will confirm staff's analysis upon issuance of the final interconnection approval. The Cal-ISO will provide testimony on the Attachment A studies, the Supplemental Studies and the Detailed Facilities Study Report and will provide conclusions and findings in the Energy Commission's hearings.

At this time staff does not expect the project will require any downstream facilities. 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 PG&E/applicant Facility Interconnection

[4] These are mere examples, many more exist.

Agreement. Interconnection of the project will comply with reliability criteria assuming implementation of the conditions of certification.

RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

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 substation configurations is acceptable.

The MEC 230 kV switchyard shall include busses in a breaker and a half scheme.

Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with the short-circuit analysis.

The power plant switchyard, outlet line and termination shall meet or exceed the requirements CPUC General Order 95.

The new transmission line will be a 230 kV double circuit line overhead extending 240 feet from the take off towers located inside the MEC switchyard to the existing tower No.0/6 of the Metcalf to Monta Vista No. 4 line located in the existing PG&E corridor. The tower will be modified to accommodate the new circuits.

Termination facilities at the interconnection shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E 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 transmission interconnection will use bundled 2300 kcmil AAC conductors.

The applicant shall provide proof of Cal-ISO final interconnection approval including an executed Facilities Interconnection Agreement. The final DFS on which the interconnection agreement with PG&E is based shall be provided.

Remedial Action Scheme sequencing and timing (if used) shall be fully described.

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM, 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 1a through 1i above. The Cal-ISO final interconnection approval and executed interconnection agreement shall be provided and include requirement 1I, above. 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 1h 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 or substation 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 GO-95, CPUC Rule No. 21, the PG&E Interconnection Handbook and these conditions. 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 synchronization of the project, the project owner shall transmit to the CPM an engineering description(s), and one-line drawings of the “as-built” facilities, signed and sealed by the registered electrical engineer in charge. A statement attesting to conformance with CPUC GO-95, CPUC Rule No. 21, the PG&E Interconnection Handbook, and these conditions shall be concurrently provided.

REFERENCES

Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator) 1999, California ISO's comments regarding the MEC project's PG&E Detailed Facilities Study Report. Letter from Jeff Miller to Kenneth Abreau, dated September 2, 1999.

Cal-ISO (California Independent System Operator) 2000a, California ISO's preliminary approval letter and comments regarding the MEC project's PG&E Supplemental Studies to the Detailed Facilities Study Report. Letter from Jeff Miller to Kenneth Abreau, dated February 11, 2000.

CEC (California Energy Commission). 2000a. Summary of biological resources workshop and 31 electric transmission system questions and answers. March 3, 2000.

MEC (Metcalf Energy Center) 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.

MEC (Metcalf Energy Center) 1999b. Metcalf Energy Center Generating Facility-Detailed Facilities Study Report. Submitted to the California Energy Commission July 8, 1999.

MEC (Metcalf Energy Center) 2000a. Metcalf Energy Center Generating Facility-Supplemental Studies to the Detailed Facilities Study Report. Submitted to the California Energy Commission January 19, 1999.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

PG&E (Pacific Gas and Electric Company) 1999. Application of Pacific Gas and Electric Company for a Certificate of Public Convenience and Necessity authorizing the construction of the Northeast San Jose Transmission Project. Application No. 99 09 029. Submitted to the California Public Utilities Commission September 9, 1999.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

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.

ALTERNATIVES

Gary Walker

SUMMARY

Several alternatives are environmentally preferable to the proposed project. These include the “No Project” alternative, a power plant with a smaller generating capacity, and staff’s alternative sites Alt-1, Alt-2, Alt-3, and Alt-4. Staff’s alternative sites Alt-5 and Alt-6 also appear, on balance, to be environmentally preferable to the proposed project. Staff’s sites Alt-3 and Alt-4 are the environmentally superior alternatives to the proposed project.

THE “NO PROJECT” ALTERNATIVE

The “No Project” alternative would avoid all of the environmental impacts that the proposed project would create. Energy Commission staff has determined that the MEC project would cause significant unavoidable impacts in regard to land use and visual resources, and possibly in regard to biological resources. Also, the applicant has not demonstrated that the proposed project would avoid significant water supply impacts.

If a different new energy generation facility would be built in the absence of MEC, it is not possible to identify the particular project. Each of the new generation facilities that will be built in California will differ in the particular environmental impacts that it has the potential to cause, primarily because of site-specific conditions. Therefore it is not possible to determine with certainty that a “substitute” project would cause less environmental impact than the MEC. However, the Energy Commission has found that recent projects that it has certified would not cause significant unmitigable environmental impacts. Therefore, it appears likely that a “substitute” project could avoid the significant environmental impacts of the MEC. Thus, even assuming that a different new energy facility would be built in the absence of the MEC, the “No Project” alternative would likely be environmentally superior to the proposed project.

TECHNOLOGY ALTERNATIVES

DEMAND SIDE MANAGEMENT

The Warren-Alquist Act prohibits the agency, in its alternatives analysis, from considering 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.

RENEWABLE RESOURCES

Because of problems related to resource availability, feasibility, and environmental impacts, technologies employing renewable resources to generate electricity cannot meet expected electricity demand in California.

ALTERNATIVE GENERATING CAPACITIES

A power plant with a smaller generating capacity than the proposed project may eliminate or reduce to a level of insignificance some significant impacts of the proposed project, and may reduce other significant impacts of the proposed project but not to a less than significant level. Overall, a power plant with a smaller generating capacity would be environmentally superior to the proposed project.

STAFF ALTERNATIVE SITES

The following discussion compares the environmental impacts of the proposed project to the use of each of staff's six alternative sites. **ALTERNATIVES Table 1** shows staff's assessment of the expected environmental impacts of the proposed project and of use of staff's alternative sites.

ALT-1 AND ALT-2

The proposed project and use of site Alt-1 or Alt-2 are essentially the same in regard to impacts to air quality, geological and paleontological resources, noise, public health, socioeconomics, soil and water resources, and traffic and transportation. The proposed project has less potential for significant impacts to cultural resources than use of site Alt-1 or Alt-2, but impacts due to any of these three options are likely to be mitigable to a less than significant level. Overall, use of site Alt-1 or Alt-2 is environmentally preferable to the proposed project because:

1. It would avoid a significant biological impact of the proposed project for which mitigation is unresolved;

2. It would avoid significant unmitigable land use impacts of the proposed project in regard to inconsistency with detailed design standards of local plans; and incompatibility with nearby land uses; and

3. It would avoid the significant unmitigable visual impacts of the proposed project.

ALT-3

The proposed project and use of site Alt-3 are essentially the same in regard to impacts to air quality, noise, public health, socioeconomics, and traffic and transportation. The proposed project has less potential for significant impacts to cultural resources than use of site Alt-4, but impacts due to either option are likely to be mitigable to a less than significant level. Overall, use of site Alt-3 is environmentally preferable to the proposed project because:

ALTERNATIVES Table 1
Comparison of Proposed Project and Staff's Alternative Sites in Regard to Impact Significance

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
AIR QUALITY	Significant adverse impacts as proposed , but mitigable	Potentially significant impacts, but mitigable	Potentially significant impacts, but mitigable	Potentially significant impacts, but mitigable	Potentially significant impacts, but mitigable	Potentially significant impacts, but mitigable	Potentially significant impacts, but mitigable
BIOLOGICAL RESOURCES	Potential significant impacts, mitigation unresolved	No potential significant impacts	No potential significant impacts	No potential significant impacts	No potential significant impacts	Potential significant impacts; one may be unmitigable	Potential significant impacts; one may be unmitigable
CULTURAL RESOUCES	Potential significant impacts, but mitigable	Greater potential for significant impacts than proposed project, but mitigable	Greater potential for significant impacts than proposed project, but mitigable	Greater potential for significant impacts than proposed project, but mitigable	Greater potential for significant impacts than proposed project, but mitigable	Potential for significant impacts, but less than proposed project, and mitigable	Potential for significant impacts, but less than proposed project, and mitigable
GEOLOGICAL AND PALEONTOLOGICAL RESOURCES	No expected significant impacts re: geological hazards, geological resources, or paleontological resources; potential significant impacts re: flooding, but mitigable	No expected significant impacts re: geological hazards, geological resources, or paleontological resources; potential significant impacts re: flooding, but mitigable; unknown potential for impacts re: linears, but expected to be mitigable	No expected significant impacts re: geological hazards, geological resources, or paleontological resources; potential significant impacts re: flooding, but mitigable; unknown potential for impacts re: linears, but expected to be mitigable	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, and lower flooding potential; Unknown potential re: linears, but expected to be mitigable	For power plant site, no expected significant impacts re: geological hazards, geological resources, paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable	For power plant site, no expected significant impacts re: geological hazards, geological resources, paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable	For power plant site, no expected significant impacts re: geological hazards, geological resources, paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
LAND USE	Significant unmitigable adverse impacts: inconsistent with local plans; incompatible with adjacent uses	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected
NOISE	Significant as proposed, but could be mitigated to insignificant	Significant as proposed, but could be mitigated to insignificant	Significant as proposed, but could be mitigated to insignificant	Significant as proposed, but could be mitigated to insignificant	Significant as proposed, but could be mitigated to insignificant	No significant impacts	No significant impacts
PUBLIC HEALTH	No significant impacts expected.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; potential could be less than for proposed site; any impacts could be mitigated to less than significant.	No significant impacts expected; potential could be less than for proposed site; any impacts could be mitigated to less than significant.
SOCIOECONOMICS	Significant adverse impact to emergency services as proposed, but mitigable	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
SOIL AND WATER RESOURCES	Impact of discharge water significant and unmitigated; but mitigable; uncertain impact re water supply ; benefit of reduced effluent discharge to South Bay	Same as the proposed project	Same as the proposed project	Impact of discharge water significant and unmitigated with connection to SBWR, but no significant impact with connection to WWTP	Impact of discharge water significant and unmitigated with connection to SBWR, but no significant impact with connection to WWTP	Potential significant impact to water supply; may be mitigable with dry cooling, but impacts to potable water supply may remain; Potential significant impact of discharge water; could be mitigated with evaporation ponds or zero discharge system	Potential significant impact to water supply; may be mitigable with dry cooling, but impacts to potable water supply may remain; Potential significant impact of discharge water; could be mitigated with zero discharge system
TRAFFIC AND TRANSPORTATION	Hazard at railroad crossing; mitigable	Potential traffic delays; mitigable	Potential traffic delays; mitigable	No impacts requiring mitigation	Potential traffic delays; mitigable	No impacts requiring mitigation	No impacts requiring mitigation
VISUAL RESOURCES	Significant unmitigable adverse impacts	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected
WASTE MANAGEMENT	No significant impacts expected	Expected to be similar to proposed site	Expected to be similar to proposed site	Greater potential for impacts than the proposed project, but expected to be mitigable to a less than significant level.	Greater potential for impacts than the proposed project, but expected to be mitigable to a less than significant level.	Expected to be similar to proposed site	Expected to be similar to proposed site

1. It has less potential for flooding than the proposed project;

2. It would avoid a significant biological impact of the proposed project for which mitigation is unresolved;

3. It would avoid significant unmitigable land use impacts of the proposed project in regard to inconsistency with detailed design guidelines of local plans, and incompatibility with nearby land uses;

4. It may avoid a potential significant water resources impact of the proposed project in regard to TDS, depending on the source of the water and where it is discharged; and
5. It would avoid the significant unmitigable visual impacts of the proposed project.

ALT-4

The proposed project and use of site Alt-4 are essentially the same in regard to impacts to air quality, noise, public health, socioeconomics, and traffic and transportation. The proposed project has less potential for significant impacts to cultural resources than use of site Alt-4, but impacts due to either option are likely to be mitigable to a less than significant level. Overall, use of site Alt-3 is environmentally preferable to the proposed project because:

1. It would avoid the potential significant flooding impact of the proposed project;

2. It would avoid a significant biological impact of the proposed project for which mitigation is unresolved;

3. It would avoid significant land use impacts of the proposed project in regard to:

    a. inconsistency with the General Plan;

    b. inconsistency with zoning;

    c. inconsistency with detailed design standards of local plans;

    d. unmitigable impacts on prime farmland;

    e. unmitigable incompatibility with nearby land uses;

4. It may avoid a potential significant water resources impact of the proposed project in regard to salinity, depending on the source of the water and where it is discharged; and

5. It would avoid the significant unmitigable visual impacts of the proposed project.

ALT-5 AND ALT-6

The proposed project and use of site Alt-5 or Alt-6 are essentially the same in regard to impacts to air quality, geological and paleontological resources, public health, socioeconomics, and traffic and transportation. In regard to biological

resources, the proposed project would cause significant impacts for which mitigation may be infeasible, and use of site Alt-5 or Alt-6 may cause some significant but mitigable impacts and another significant impact that may not be mitigable.

Use of the proposed site is preferable to the use of site Alt-5 or Alt-6 in the following respects:

1. It has less potential to cause significant water supply impacts, and it would be consistent with state policy regarding avoidance of use of fresh inland water. (These impacts may be mitigable at site Alt-5 or Alt-6 if the project is modified to use dry cooling, although impacts to the potable water supply may remain, costs would be higher, and efficiency would be lower. Air emissions would also be greater due to the need for more fuel to generate the same electrical output, but this effect could be mitigated. A previous application has been certified by the Energy Commission with dry cooling, with a finding of no significant impacts, so this mitigation appears to be technically, economically, and environmentally feasible).

2. It has less potential to cause significant water discharge impacts. (These impacts may be mitigable at site Alt-5 or Alt-6 if the project is modified to use a zero discharge system with evaporation ponds, although this mitigation would increase costs and the amount of land used for the project. Another application under Energy Commission review proposes a zero discharge system with an evaporation pond, so such mitigation appears to be technically and economically, and environmentally feasible).

3. It would have the benefit of reduced effluent discharge to the South Bay associated with the use of reclaimed water.

Use of site Alt-5 or Alt-6 is preferable to the proposed project in the following respects:

1. It has less potential for significant impacts to cultural resources, although impacts are likely to be mitigable for either the alternative site or the proposed project;

2. It would avoid significant land use impacts of the proposed project in regard to

   a. inconsistency with the General Plan;

   b. inconsistency with zoning;

   c. inconsistency with detailed design standards of local plans;

   d. unmitigable impacts on prime farmland; and

   e. unmitigable incompatibility with nearby land uses; and

3. It would avoid the significant unmitigable visual impacts of the proposed project.

Some significant land use and visual impacts due to the proposed project would be unmitigable, whereas all of the potential significant impacts due to use of site Alt-5 or Alt-6 either may be mitigable or may not occur. Therefore, based on available information, use of site Alt-5 or Alt-6 appears to be environmentally preferable to the proposed project.

SUMMARY

Staff's sites Alt-3 and Alt-4 are the environmentally superior alternatives to the proposed project. Use of staff's alternative site Alt-1, Alt-2, Alt-3, or Alt-4 is environmentally preferable to the proposed project. Use of staff's alternative site Alt-5 or Alt-6 appears to be environmentally preferable to the proposed project. Sites Alt-3 and Alt-4 are approximately equal and are preferable to staff's other alternative sites because staff does not expect the use of either site Alt-3 or Alt-4 to cause any significant environmental impacts.

PURPOSE OF THE ALTERNATIVES ANALYSIS

The purpose of the California Energy Commission (Energy Commission) staff's alternatives analysis is to provide the Energy Commission with an analysis of alternatives that could avoid or substantially lessen any potentially significant adverse impacts of the proposed project. (Cal. Code Regs., tit. 14, §15126(d)) (Cal. Code Regs., tit. 20, § 1765) This analysis identifies the potential significant environmental impacts of the Metcalf Energy Center (MEC) and analyzes technology and site alternatives and their ability to reduce or avoid potential significant impacts of the proposed project.

LEGAL GUIDANCE FOR ALTERNATIVES ANALYSIS

The Energy Commission has jurisdiction over licensing thermal power plants located in California that are equal to or larger than 50 megawatts in size. The Energy Commission is therefore the lead agency as defined by the California Environmental Quality Act (CEQA) regarding applications for such power plants. One of the basic purposes of CEQA is to identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1). The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations Section 15126(d), provide direction by requiring an 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," even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (Section 15126.6). In addition, the analysis must address the "No Project" alternative.

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. CEQA states that an environmental document does not have to consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. (Cal. Code

Regs., tit. 14, ɔ 15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate. (*City of Santee v. County of San Diego* (4th Dist. 1989) 214 Cal.App. 3d 1438).

STAFF APPROACH FOR ALTERNATIVE SITE ANALYSIS

Staff used the following approach in its alternatives analysis for the Metcalf Energy Center.

1. Describe the project objectives.
2. Identify any potential significant environmental impacts of the project.
3. Evaluate the environmental impacts of not constructing the project to determine whether the "no project" alternative is superior to the project as proposed.
4. Evaluate alternative technologies.
5. Determine which, if any, of the potential significant impacts could potentially be avoided by use of an alternative site.
6. Develop screening criteria for feasibility of alternative sites.
7. Select a reasonable range of alternative sites that:
   a. Meet most of the basic objectives of the project.
   b. Avoid or substantially lessen one or more of the potential significant effects of the project.
   c. Satisfy the feasibility screening criteria.
8. If any alternative sites are deemed infeasible, explain why.
9. Evaluate the environmental impacts of each feasible alternative site.
10. Compare the alternative sites to each other and to the proposed site in regard to the environmental impacts that use of each site would cause.
11. If the "no project" alternative is superior to the proposed project, identify the preferred environmental alternative.

PROJECT OBJECTIVES

Of the project objectives listed in the Application for Certification (AFC) (Calpine/Bechtel 1999a), staff has identified the following objectives relevant to alternative site selection:

1. Being on-line by the summer peak of 2002.
2. Providing [San Francisco] Bay Area electric grid reliability benefits.
3. Mitigating transmission congestion into the area.
4. Located near key infrastructure.

5. Having land of adequate size and shape to contain the proposed facilities and other site improvements.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

Staff initially identified potential significant environmental effects of the proposed project on air quality, biological resources, land use, traffic and transportation, and visual resources. Staff used these effects in identifying potential alternative power plant sites (see the following discussion). Since that time, additional information has caused staff to revise its assessment of some potential impacts. However, staff's consideration of these changes did not cause the deletion of any identified alternative sites or the need to identify any additional sites. Staff's current assessment of the expected environmental consequences of the proposed project is discussed in more detail in the individual sections of the Preliminary Staff Assessment. Staff used these assessments in comparing the impacts of the proposed project to those of using alternative sites (see the subsequent section on that topic).

AIR QUALITY

Staff initially thought that the proposed project might contribute to significant local air quality impacts due to the downwash effect on exhaust stack emissions due to nearby Tulare Hill.

BIOLOGICAL RESOURCES

Staff initially thought that the proposed project might have significant impacts on biological impacts in two respects. First, the project as originally proposed would have caused the loss of Ordinance Trees, as described in the Monterey Road Tree Survey and Impact Evaluation. Second, nitrogen loading due to exhaust emissions would threaten rare serpentine communities and associated sensitive plant and animal species.

LAND USE

The proposed project would not conform to a number of land use policies in local land use plans, including the City of San Jose's General Plan, the North Coyote Valley Plan, and the Riparian Corridor Study; and the Santa Clara County General Plan.

TRAFFIC AND TRANSPORTATION

The proposed access road for the project poses a safety risk at the crossing of the Union Pacific Railroad.

VISUAL RESOURCES

The proposed power plant would cause significant visual impacts to a number of view areas. The project also would not conform to a number of visual resource policies in local land use plans, including the City of San Jose's General Plan, the

North Coyote Valley Plan, and the Riparian Corridor Study; and the Santa Clara County General Plan.

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 built. It is compared to the proposed project and determined to be superior, equivalent, or inferior to it.

In the AFC (MEC 1999a, p.9-1) the applicant stated that if the project is not constructed and operated,

"energy that would have been produced by the proposed facility would need to be generated by another available source; common available sources include older power generation facilities that operate inefficiently and release larger quantities of air pollutants."

> "The purpose of a merchant power plant, such as MEC, is to generate and sell electricity to deregulated markets. The California market was deregulated on March 31, 1998….
>
> "The 'No Project' alternative is not considered feasible because it does not meet the objectives of a deregulated energy market, nor does it meet Calpine/Bechtel's business plans for the development of new merchant power generation facilities, or the general objective of replacing existing, less efficient generation facilities."

The applicant also states that MEC's consumption of less fuel and discharge of fewer air emissions for each energy unit generated when compared to other existing, older fossil fuel generation facilities is a beneficial environmental impact.

Energy Commission staff does not agree with the applicant's position for several reasons. If the MEC project is not built, the same market conditions that encouraged it to be proposed will encourage others. Therefore, the "no project" alternative is feasible. 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 retired, nuclear and 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 fact that the “No Project” alternative does not meet Calpine/Bechtel’s business plans has no bearing on its feasibility. The private objectives of an applicant are not relevant to public objectives that the Energy Commission considers in evaluating applications for new generation facilities.

The “No Project” alternative would avoid all of the environmental impacts that the proposed project would create. Energy Commission staff has determined that the MEC project would cause significant unavoidable impacts in regard to land use and visual resources, and possibly in regard to biological resources. Also, the applicant has not demonstrated that the proposed project would avoid significant water supply impacts.

If a different new energy generation facility would be built in the absence of MEC, it is not possible to identify the particular project. Each of the new generation facilities that will be built in California will differ in the particular environmental impacts that it has the potential to cause, primarily because of site-specific conditions. Therefore it is not possible to determine with certainty that a “substitute” project would cause less environmental impact than the MEC. However, the Energy Commission has found that recent projects that it has certified would not cause significant unmitigable environmental impacts. Therefore, it appears likely that a “substitute” project could avoid the significant environmental impacts of the MEC. Thus, even assuming that a different new energy facility would be built in the absence of the MEC, the “No Project” alternative would likely be environmentally superior to the proposed project.

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 monopolies, 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.

RENEWABLE RESOURCES

Staff examined the principal electricity generation technologies that could serve as alternatives to the proposed project and do not burn fossil fuels. These technologies are geothermal, solar, hydroelectric, wind, and biomass. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions. However, these technologies also cause environmental consequences and have feasibility problems.

Solar, wind, and hydroelectric resources require large land areas in order to generate 600 megawatts of electricity. Specifically, centralized solar projects using the parabolic trough technology require approximately 5 acres per megawatt. This 600 MW plant would require approximately 3,000 acres. Photovoltaic arrays require similar acreage per megawatt. Centralized wind generation areas generally require 40-50 acres per megawatt, with 600 megawatts requiring 24,000 - 30,000 acres. Large hydroelectric facilities generating 600 megawatts would inundate at least 30,000 acres with water. These technologies have the potential to cause significant land use, biological, cultural resource, and visual impacts. In summary, staff does not believe that these alternatives would be environmentally preferable to the proposed project.

Staff also considered the alternative of a biomass facility. However, biomass facilities are generally in the 3 to 10 MW range, must overcome significant fuel source reliability issues, have difficulty being economically competitive, and are typically worse from an air quality perspective than natural gas. For these reasons

such a project would not be a feasible alternative, nor would it be likely to sufficiently satisfy project goals.

Severe resource constraints also exist for most of the renewable technologies. Geothermal resources sufficient to generate substantial amounts of electricity are not available. Opportunities for new hydroelectric, wind, or biomass generation are very limited.

ALTERNATIVE GENERATION CAPACITIES

Staff requested that the applicant provide an analysis of alternative capacity output scenarios such as 120 MW and 240 MW that discuss whether or not the facility with a smaller output would meet local site requirements. Staff also asked for a description of and site plan for the largest sized (capacity output) facility that would meet setback requirements and height limitations (CEC 1999, Data Requests 18 and 19). The applicant's response stated that other recent applications to the Energy Commission were for projects 500 MW or greater, that "power plant projects of lesser capacity appear to be economically infeasible" and that ""the project needs to be of the size and configuration proposed to meet the project objectives" (Calpine/Bechtel 1999i, Data Responses #24 and 25). However, the applicant has not provided information that proves that a plant with a smaller generating capacity is infeasible.

A power plant with a smaller generating capacity could reduce some of the environmental impacts of the proposed project. Some inconsistencies with the City's North Coyote Valley Campus Industrial Area Master Development Plan could be eliminated, such as those regarding setbacks. A smaller power plant would not require as large an area as the proposed project. Given the space constraints at the proposed site, a smaller power plant would have more layout flexibility and may be able to eliminate some of the proposed project's inconsistencies with policies of the City's Riparian Corridor Policy Study, such as locating loading and unloading areas and noise generating equipment away from the riparian edge of the property. The height of the HRSG structures could be lower and might be less than the 95-foot height limit for the Public Quasi-Public General Plan designation. It is unlikely that the HRSG stacks would be consistent with this limit. However, it may be possible for a smaller capacity power plant to have shorter HRSG stacks than those of the proposed project, decreasing the contrast with the maximum allowable height of 120 feet for the Campus Industrial area. A smaller power plant would still be inherently incompatible with the uses planned for the area. Such a power plant would still cause a significant unmitigable impact on agriculture by eliminating Prime Farmland, although the acreage lost might be less. A smaller capacity power plant would have lower water needs, so the potential for water supply impacts would be reduced. A smaller power plant would also be likely to have lower noise levels than the proposed project, although noise mitigation would likely still be required. A smaller power plant would have less visual impact than the proposed project. Analysis of a specific design would be required to precisely determine the visual impacts of a smaller power plant. However, the visual impact could still be significant and unmitigable. Therefore, a smaller power plant may still be incompatible with nearby land uses. The impacts of air emissions on biological

resources would still be significant, but staff expects that the impacts would be less than for the proposed project. In summary, a power plant with a smaller capacity may eliminate some significant impacts of the proposed project and would reduce some other significant impacts but not to a less than significant level. Overall, a power plant with a smaller output capacity would be environmentally superior to the proposed project.

POTENTIAL SIGNIFICANT IMPACTS THAT COULD POTENTIALLY BE AVOIDED BY USE OF AN ALTERNATIVE SITE

Because all of the proposed project's potential significant environmental impacts that staff initially identified (discussed above) would be site specific, staff determined that use of an alternative site might avoid or substantially lessen any of the impacts. The same is true for any of the significant impacts that staff's updated analysis has identified. These impacts are discussed below in the subsection entitled "Evaluation of Staff's Alternative Sites in Regard to Site Selection Criteria, and in more detail in the subsection entitled "Evaluation of Identified Feasible Sites and Comparison to the Proposed Project."

ALTERNATIVE SITES

This analysis addresses alternative sites for the project that were identified by several sources, including the applicant, members of the public, an electric system consultant to the City of Santa Clara, and Energy Commission staff. Staff identified its alternative sites through independent staff investigations. Staff contacted local governments and commercial/industrial real estate brokers and made field visits.

STAFF'S ALTERNATIVE SITE SELECTION CRITERIA

Staff considered the following factors in selecting alternative sites:

a. meet most of the basic objectives of the project;

b. avoid or substantially lessen one or more of the potential significant effects of the project; and

c. satisfy the following screening criteria:
    1. Site suitability. Approximately 14 acres are required for the site. The shape of the site also affects its usability.
    2. Availability of infrastructure. The site should be within a reasonable distance of the electric transmission system, natural gas supply, and water supply.
    3. Availability of the site.
    4. General Plan and zoning consistency.
    5. Not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas.

STAFF'S ALTERNATIVE SITES

Staff examined a large area to identify alternative sites. The primary study area was the region bordering the southern portion of San Francisco Bay, from Milbrae on the northwest to Fremont on the northeast. This area was chosen based on technical staff advice that any of six substations in that area could accommodate the electricity generated by a power plant of the size proposed. Staff found that potential feasible sites that could meet staff's screening criteria are rare. Almost all of the buildable land in the study area has been developed, so few sites of adequate size exist. In addition, plans, policies, and ordinances of many local governments in the area either prohibit heavy industry (such as a power plant), discourage new heavy industrial facilities in areas currently devoted to heavy industry, or discourage expansion of heavy industry into areas where it is not currently the predominant land use. Because of the scarcity of sites in this area, staff also considered outlying areas, including Gilroy, Moss Landing, and eastern Alameda County, all near existing power plants or substations that connect directly to the study area.

DESCRIPTION OF STAFF'S ALTERNATIVE SITES

Staff identified six sites that appear to qualify as alternatives to the proposed site. **ALTERNATIVES Figure 1** is a regional map showing all six of staff's alternative sites. The sites consist of the following.

- Sites Alt-1 and Alt-2 near each other in the northern San Jose area, north of Highway 237 and between Zanker Road and I-880, adjacent to PG&E's proposed site for its Los Esteros Substation (see **ALTERNATIVES Figure 2**).
- Sites Alt-3 and Alt-4 in the City of Fremont (see **ALTERNATIVES Figure 3**).
- Sites Alt-5 and Alt-6 in unincorporated Alameda County, south of Interstate 580 and adjacent to PG&E's Tesla Substation (see **ALTERNATIVES Figure 4**).

ALT-1 AND ALT-2

Sites Alt-1 and Alt-2 were originally identified by Calpine/Becthel as potential sites for a power plant that would be adjacent to PG&E's proposed Los Esteros Substation in northern San Jose. A 230 kV substation and a 230 transmission line to Newark Substation, which the PG&E project would provide, are prerequisites for A project in this area with the generating capacity of MEC would require such a substation and the On March 1, 1999, Calpine/Bechtel filed General Plan Amendment applications with the City of San Jose regarding the sites. However, Calpine/Bechtel later withdrew those applications, citing uncertainty regarding the construction of the substation as one reason for the withdrawal. PG&E's application for the substation is currently in the review process before the CPUC, and the schedule calls for a decision on the application later this year. Energy Commission staff has conferred with the consultant preparing the EIR for the substation project (Aspen Environmental, our own soon-to-be consultant) (Aspen 2000). No fatal flaw has yet been identified for the substation project. Therefore, Energy Commission staff considers the adjacent sites as potential feasible alternative sites for the Metcalf project.

The parcels containing the sites are currently in agricultural use. Both are designated Light Industrial by the San Jose General Plan and zoned Light Industrial. The City recommended to Calpine/Bechtel that for a power plant at either site a General Plan Amendment should be requested to change the Light Industrial designation to Public/Quasi-Public.

Site Alt-1 is located approximately 2,400 feet north of State Route 237, east of Zanker Road and west of Coyote Creek (see **ALTERNATIVES Figure 2**). It consists of the northwestern 13 acres of a 66.46 acre parcel known locally as the Cilker property. The parcel is currently in agricultural use, and contains two farmhouses near its southern end.

Site Alt-1 is located close to the San Jose/Santa Clara Water Pollution Control Plant (WPCP), which would serve as the source of recycled water for the project. A route to the treatment plant following existing roads would be approximately 4,000 feet long. A natural gas line runs adjacent to the site, with another line approximately 1,500 feet to the south of the site. Because the site is adjacent to the proposed site

ALTERNATIVES Figure 1
Regional Map of Staff's Alternative Sites

ALTERNATIVES Figure 2
Staff's Alternative Sites Alt-1 and Alt-2

ALTERNATIVES Figure 3
Staff's Alternative Sites Alt-3 and Alt-4

ALTERNATIVES Figure 4
Staff's Alternative Sites Alt-5 and Alt-6

for PG&E's Los Esteros Substation, the length of the electrical transmission connection would be minimal.

ALT-2

Site Alt-2 is located adjacent to the north side of State Route 237, east of Zanker Road and west of Coyote Creek (see **ALTERNATIVES Figure 2**). It consists of the southern 30 acres of a 54.6 acre parcel known locally as the Lin/Hom property. The entire parcel is currently occupied by greenhouses, agricultural facilities, and buildings that house residents engaged in agricultural work.

Site Alt-2 is located close to the San Jose/Santa Clara WPCP, which would serve as the source of recycled water for the project. A route to the treatment plant following existing roads would be approximately 6,000 feet long. A natural gas line runs adjacent to the site, with another line approximately 1,500 feet to the north of the site. Because the site is adjacent to the proposed site for PG&E's Los Esteros Substation, the length of the electrical transmission connection would be minimal.

ALT-3

Site Alt-3 is located on a parcel of land that is partially occupied by the existing Borden Chemical facility on Boyce Road in the City of Fremont (see **ALTERNATIVES Figure 3**). Adjacent land uses are industrial, including the Borden facility, a Cellulite plant, and warehouses.

There are two potential sources of recycled water for the site Alt-3: the South Bay Water Recycling (SBWR) Program and the Alameda County Union Sanitary District (USD) Alvarado Waste Water Treatment Plant (WWTP). The closest connection to the SBWR Program is in Milpitas where the distribution system extends northward on the west side of I-880 to the Alameda County-Santa Clara County border. The distance from the existing distribution system to the site is approximately eight miles. The USD Alvarado WWTP is located in Union City, approximately eight miles from the site. A potable water line adjacent to the site apparently could provide most of the potable water needed for the project. Drilling new on-site wells may be able to provide additional water. Sanitary sewer lines are in the immediate vicinity of the site. Waste water disposal would probably require a dedicated blowdown brine line to the San Jose/Santa Clara WPCP (approximately nine miles) or to the Alvarado WWTP (approximately eight miles).

PG&E high pressure natural gas transmission lines are approximately two miles to the northeast. A route for a connecting line would be expected to follow city streets to the site. An overhead or underground electric transmission line would follow existing streets from the site to the existing PG&E Newark Substation approximately one mile away.

ALT-4

Site Alt-4 is northwest of the intersection of Grimmer Boulevard and Warm Springs Boulevard in the City of Fremont (see **ALTERNATIVES Figure 3**). The site consists of two parcels totaling 20.66 acres. The site is flat and vacant. Surrounding land uses are primarily industrial and commercial, including a lumber

yard, a truck trailer and railcar storage yard, a large RV storage yard. A huge GM/Toyota car manufacturing plant is approximately one-half mile to the south. Two homes on large lots with orchards are located east of the site, across Old Warm Springs Road.

There are two potential sources of recycled water for the site Alt-4: the South Bay Water Recycling (SBWR) Program and the Alameda County Union Sanitary District (USD) Alvarado Waste Water Treatment Plant (WWTP). The closest connection to the SBWR Program is in Milpitas where the distribution system extends northward on the west side of I-880 to the Alameda County-Santa Clara County border. The distance from the existing distribution system to the site is approximately seven miles. The USD Alvarado WWTP is located in Union City, approximately 11 miles from the site. A potable water line is adjacent to the site apparently could provide most of the potable water needed for the project. Drilling new on-site wells may be able to provide additional water. Sanitary sewer lines are in the immediate vicinity of the site. Waste water disposal would probably require a dedicated blowdown brine line to the San Jose/Santa Clara WPCP (approximately six miles) or to the Alvarado WWTP (approximately 11 miles).

PG&E high pressure natural gas transmission lines are adjacent to the site. An electric transmission line would connect the site to the existing PG&E Newark Substation. One route approximately three miles long may use existing towers that currently have one 115 kV circuit. It is not known whether the existing towers could accommodate the 230 kV outlet needed for the project. Using another route approximately 2 ½ miles long would likely require placing the lines underground.

ALT-5

Site Alt-5 is located on a 49.53 acre parcel in rural eastern Alameda County. The site is adjacent to the north side of PG&E's Tesla Substation. The site is currently used for grazing. Surrounding land is also used for grazing. A PG&E high-pressure natural gas transmission line runs through the substation property less than 1,000 feet south of the site. Because the site is adjacent to the existing Tesla substation, the length of the electrical transmission connection would be minimal. Constraints exist regarding water supply and wastewater disposal (see the subsequent discussion of Soil and Water Resources in relation to this site).

ALT-6

Site Alt-6 is located on a 299.1 acre parcel in rural eastern Alameda County. The site is adjacent to the northwest side of PG&E's Tesla Substation. The site is currently grazing land with a wind farm on the western portion. With the exception of the substation, surrounding land is used for grazing. A PG&E high-pressure natural gas transmission line runs through the substation property less than 1,000 feet south of the site. Because the site is adjacent to the existing Tesla substation, the length of the electrical transmission connection would be minimal. Constraints exist regarding water supply and wastewater disposal (see the subsequent discussion of Soil and Water Resources in relation to this site).

EVALUATION OF STAFF'S ALTERNATIVE SITES IN REGARD TO SITE SELECTION CRITERIA

A discussion of the six sites in relation to the selection factors follows.

a. Meet most of the Basic objectives of the project.

Staff has made the following determinations regarding the extent to which alternative sites are likely to meet the five basic project objectives identified above that are relevant to alternative site selection:

1. Being on-line by the summer peak of 2002.

Use of any alternative site could not satisfy this objective, because detailed site investigation and the permit process have not begun on any alternative site.

2. Providing Bay Area electric grid reliability benefits.

All of the staff's identified alternative sites would provide such benefits, to differing degrees.

3. Mitigating transmission congestion into the area.

To satisfy objective 3 the site must be connected to one of following six Pacific Gas & Electric substations or the 230 kilovolt transmission lines that connect them: Metcalf, Monta Vista, Jefferson, Newark, Ravenswood, or San Mateo. Sites Alt-1, Alt-2, Alt-3, and Alt-4 satisfy this objective.

4. Having land of adequate size and shape to contain the proposed facilities and other site improvements.

Staff generally considered sites 14 acres or larger unless specific circumstances indicated that a smaller site may be sufficient. Five of the alternative sites (Alt-1, Alt-2, Alt-4, Alt-5, and Alt-6) are larger than 14 acres and their shape creates no obstacle to their use. The sixth site (Alt-3) is approximately ten acres in size. Staff considered it potentially adequate in size and suitable for three reasons: 1) most of the boundary length of the site is bordered by industrial uses, so required buffering of public frontage would be minimal; 2) access road requirements would be minimal; and 3) the possibility exists for sharing some facilities with adjacent industrial uses.

5. Located near key infrastructure.

Staff has limited its search area to a reasonable distance from substations and transmission lines. Major natural gas lines are located in the vicinity of the identified sites. Staff has identified adequate water supply sources and water disposal infrastructure for sites Alt-1, Alt-2, Alt-3, and Alt-4. Existing water sources may be able to provide for some of the project's water needs at sites Alt-5 and Alt-6. However, meeting other water needs may require technically feasible alternative mitigation technology.

Three of the six sites (Alt-1, Alt-2, and Alt-4) satisfy objectives 2, 3, 4, and 5. Site Alt-3 satisfies objectives 2, 3, and 5, and may satisfy objective 4. The other two sites (Alt-5 and Alt-6) satisfy objective 4 and may satisfy objectives 2 and 5.

b. Avoid or substantially lessen one or more of the potential significant effects of the project.

Potential Significant Impacts of the Project Initially Identified

Staff used the following initially identified potential significant impacts to identify alternative sites that could avoid or substantially reduce the potential significant effects of the proposed project.

Air Quality/

- None of the alternative sites would cause downwash from nearby elevated terrain.

Biological Resources

- Five of the six sites do not infringe on a riparian corridor. One site, Alt-5, has a riparian corridor along one edge of the site. However, the site is of sufficient size (49.53 acres) to avoid the riparian corridor.
- Significant Trees do not exist on any of the alternative sites.
- Use of any of the alternative sites would not threaten rare serpentine communities and associated sensitive plant and animal species.

Land Use

- Four of the sites (Alt-3, Alt-4, Alt-5, and Alt-6) conform to general plan designations and zoning. Two sites (Alt-1 and Alt-2) would not conform to general plan designations and zoning.

Traffic and Transportation

- Use of any of the six alternative sites would avoid the railroad crossing safety problem of the proposed project.

Visual Resources

- Impacts to visual resources are not expected to be significant at any of the six alternative sites (Alt-1 through Alt-6).

In summary, use of any of the alternative sites would avoid five of the potential significant impacts that staff initially identified for the proposed project (one air quality impact, three biological resources impacts, and one traffic and transportation impact). Use of any of four of the sites (Alt-3, Alt-4, Alt-5, and Alt-6) would also avoid potential significant impacts to land use and visual resources.

Updated List of Potential Significant Impacts of the Project

Staff subsequently updated its assessment of environmental impacts due to the proposed project, based on additional information and analysis. Staff used the following updated list of potential significant impacts of the proposed project to identify alternative sites that could avoid or substantially reduce the potential significant effects of the proposed project. Staff also determined that no alternative sites need to be eliminated and no new sites need to be added, because the proposed project's potential significant impacts as updated could still be avoided by use of the identified alternative sites.

Biological Resources

- Use of any of the alternative sites (Alt-1 through Alt-6) would avoid the significant adverse impact on that the proposed project would cause to serpentine habitat for which mitigation has not been resolved.

Land Use

- The proposed site does not conform to general plan designations or zoning. Use of any of four of the alternative sites (Alt-3, Alt-4, Alt-5, and Alt-6) would conform to general plan designations and zoning. Use of two alternative sites (Alt-1 and Alt-2) would not conform to general plan designations and zoning.
- Use of any of the alternative sites (Alt-1 through Alt-6) would avoid the proposed project's inconsistency with local plans, policies, and ordinances regarding detailed design standards.
- Use of alternative sites Alt-3, Alt-4, Alt-5, or Alt-6 would avoid the proposed project's significant unmitigable impact on prime agricultural land.
- Use of any of the alternative sites (Alt-1 through Alt-6) would avoid the proposed project's significant unmitigable impacts due to incompatibility with nearby land uses.

Soil and Water Resources

- Use of site Alt-3 or Alt-4 could avoid the proposed project's significant impact on discharge water quality. Use of site Alt-5 or Alt-6 may constrained by insufficient water supply and water disposal infrastructure, without mitigation.

Visual Resources

- Use of any of the alternative sites (Alt-1 through Alt-6) is expected to avoid the significant unmitigable adverse impacts to visual resources that the proposed project would cause.

In summary, use of any of staff's six alternative sites would avoid at least one significant adverse environmental impact that the proposed project would cause.

c. Satisfy the Feasibility Screening Criteria

1. Site Suitability

This criterion is the same as one of the project objectives, and has been addressed above.

2. Availability of Infrastructure

This criterion is the same as one of the project objectives, and has been addressed above.

3. Availability of the Site

All of the identified sites are potentially available. In a response to a staff data request (Calpine/Bechtel 2000, Response to Data Requests 3-207, 3-208, and 3-209, p.11), the applicant discussed what they called a "fatal flaw" for site Alt-4. This concerns deed restrictions that the applicant says "appear to prevent the sale or lease of this land to any facility which would treat, store, or dispose of hazardous waste such as that normally encountered at a MEC-type of facility." Energy Commission staff contacted the real estate department for the former owner, General Motors Corporation. Their representative stated that the section of the deed regarding restrictions related to hazardous substances, hazardous waste, and toxic substances is used in virtually all of GM's deeds. He said that in his opinion the language does not preclude storage of hazardous substances for use. He said that GM sells the majority of its property to industrial users, and that although they do not follow-up on what the new owners are storing on the property, it is assumed, if they are an industrial user, some hazardous substances will be required to be stored on site for use (Schwartz, C. 2000). Therefore, this deed restriction does not appear to be a fatal flaw in regard to use of site Alt-4 as an alternative to the proposed MEC site.

The applicant also raised the issue of the specified 40-foot height limit within the General Industrial zone in the City of Fremont. This limit would apply to both site Alt-3 and Alt-4. A number of project structures would exceed the 40-foot height limit. The applicant explains that the Fremont Zoning Ordinance permits heights above 40 feet, subject to certain provisions. The City Council must approve requests for heights greater than 46 feet. A member of the City of Fremont's Economic Development Department indicated that obtaining this height variance would be a difficult challenge (Calpine/Bechtel 2000, p.12). However, such a variance is not prohibited, so the need for it does not constitute a fatal flaw for either site Alt-3 or Alt-4.

Use of site Alt-3 or Alt-4 for the power plant would also require a permit from the Zoning Administrator. Although power plants are not

4. General Plan and Zoning Consistency

Staff has evaluated the consistency of each alternative site with the applicable general plan and zoning. Four of the sites (Alt-3, Alt-4, Alt-5, and Alt-6) are consistent with existing general plan and zoning designations. Two other sites (Alt-1 and Alt-2) would require a general plan amendment and zoning change. However, Calpine/Bechtel have already applied for general plan amendments for these sites, which are currently zoned for light industrial use. The general plan designation and zoning for sites Alt-1 and Alt-2 are closer to those appropriate for a power plant than are those of the proposed project.

5. Not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas.

All of the alternative sites satisfy this criterion.

ALTERNATIVE SITES IDENTIFIED BY THE APPLICANT

In the AFC (Calpine/Bechtel 1999a) the applicant identified and evaluated three alternative sites for the proposed power plant: sites A, B, and C. Staff has evaluated these three alternative sites. Site B is addressed in the subsection that discusses infeasible alternative sites (see below). Sites A and C are addressed in the subsection that evaluates identified feasible alternative sites (see below). The AFC also discussed the feasibility of the site of Calpine's existing power plant in Gilroy (see below).

ALTERNATIVE SITES IDENTIFIED BY OTHERS

MOSS LANDING AND GILROY

Early in the AFC process members of the public asked that Energy Commission staff evaluate PG&E's Moss Landing Power Plant and Calpine's power plant at Gilroy Foods as alternative sites for the proposed project.

STOUFFER PROPERTY

At an Energy Commission workshop on alternatives, a member of the public requested that staff consider an alternative site in the City of San Jose at the site of the former Stouffer chemical plant on Monterey Road just north of Curtner Avenue.

CITY OF SANTA CLARA

An electric system consultant to the City of Santa Clara suggested that staff consider three sites on land used by the City for electrical transmission facilities (Schwartz 2000). One site is at the Trimble Substation on First Street. Another is at the Scott Receiving Station just north of Central Expressway. The third site is at the Northern Receiving Station on Lafayette Street.

INFEASIBLE ALTERNATIVE SITES

APPLICANT'S SITE B

Staff's review of the applicant's evaluation of the applicant's alternative Site B (Calpine/Bechtel 1999a) concluded that use Site B might reduce the expected significant visual impacts of the proposed project. However, staff later learned that site B is not available (Mosso 2000), so it is not a feasible alternative.

MOSS LANDING

Staff has determined that the existing transmission system connecting the Moss Landing power plant to the Bay Area cannot accommodate the power from existing generation facilities, the proposed Moss Landing power plant, and a plant with the capacity of the proposed MEC project. Providing such capacity is likely to require a new 230 kV transmission line from the Moss Landing site to the Metcalf Substation. Such a line would likely cause significant biological, land use, and visual impacts. Even with a new line most of the power may not flow to the Bay Area. Therefore, this site is not a feasible alternative to the proposed site.

GILROY

The AFC stated that the site of Calpine's existing power plant in Gilroy site was eliminated because there is insufficient land for another power plant. The AFC also stated that the site lacks existing transmission line capacity and water for cooling (Calpine/Bechtel 1999a, pp.9.2 to 9-3). Staff requested additional information regarding this alternative, including the acreage, current land use, and general plan/zoning designations of any vacant or unused parcels adjacent to or near the Gilroy Foods plant, the cooling water and transmission interconnection options, and the nature of the constraint precluding the repowering or expansion of the Gilroy Foods power plant (CEC 1999, Data Request 14). The applicant's response indicated that no additional land is available, that the existing 115 kV line connecting the existing plant to the Llagas (Gilroy) substation has insufficient capacity to accommodate the 600 MW of a new plant, and that the Llagas substation and the existing transmission lines beyond Llagas would have to be upgraded, and that any expansion of the Gilroy plant would be in addition to MEC, not an alternative to MEC (Calpine/Bechtel 1999i, Data Response #14). Energy Commission technical staff have independently evaluated the capacity of the electrical system and agree with the applicant's position. Staff also finds the applicant's position regarding the insufficiency of land and the expansion of the existing plant to be convincing. Therefore, staff finds that the site is not a feasible alternative to the proposed project.

STOUFFER PROPERTY

Staff inquired regarding the site and learned that approval has already been granted for a building for lighter industrial use on a portion of the parcel. The owners plan to have the remainder of the parcel developed for similar uses. Therefore, the site is not available and is thus not a feasible alternative to the proposed site.

CITY OF SANTA CLARA

Two of the three sites suggested by a consultant for the City of Santa Clara, one at the Trimble Substation and one at the Scott Receiving Station, were suggested for smaller projects because they are too small for a 600 MW plant and the nearby electrical transmission connections are only to 115 kV lines (which would be inadequate to carry the power from a 600 MW plant). Staff confirmed this during a site visit. The third site is at the Northern Receiving Station. Although this site may be large enough for a 600 MW power plant, its use for such a facility would be incompatible with an adjacent high density housing development that staff identified during a site visit. In addition, this site is not in the vicinity of any 230 kV substations or transmission lines, and development of a long connector line would be likely to cause significant visual impacts on the urbanized area through which it would have to pass. Therefore, staff does not consider any of these three sites to be feasible alternatives to the proposed project.

EVALUATION OF IDENTIFIED FEASIBLE SITES AND COMPARISON TO THE PROPOSED PROJECT

THE PROPOSED PROJECT

Staff's current analysis concludes that the proposed project:

a. would cause significant unmitigable adverse environmental impacts on land use and visual resources;

b. would cause significant adverse environmental impacts on biological resources for which mitigation may be infeasible; and

c. would cause significant adverse impacts to water quality that staff expects could be reduced to less than significant with additional mitigation.

For more information on these topics, refer to the **LAND USE, VISUAL RESOURCES, BIOLOGICAL RESOURCES, AND SOIL AND WATER RESOURCES** sections of the Preliminary Staff Assessment.

APPLICANT'S ALTERNATIVE SITES A AND C

Early in staff's evaluation process staff reviewed the applicant's assessment of alternative sites A, B, and C (Calpine/Bechtel 1999a) and later visited these sites. Staff concluded that use of Site A or C would cause greater environmental impacts than the proposed site, and therefore did not conduct a detailed evaluation of the sites. A summary of staff's evaluation of these sites follows.

SITE A

Use of Site A would require a new transmission line. Connection to PG&E's existing Newark – Metcalf 1 and 2, 230 kV lines approximately 3.5 miles to the east would require passage through undeveloped land and possible threatened and endangered species habitat (Calpine/Bechtel 1999a, p.9-4). Use of Metcalf Road as a transmission line corridor would require an approximately four mile long line and is considered infeasible because of threatened and endangered species habitat. Past attempts to widen Metcalf Road have not been implemented, in part, because of threatened and endangered species habitat concerns. In addition, direct impacts to special status species would be unavoidable if site A were chosen (Calpine/Bechtel 1999a, p.9-5). Site A is located in unincorporated Santa Clara County, and is zoned Agricultural. Use of the site would require a General Plan amendment and a zoning change, as would the proposed site. Staff expects use of site A would cause significant unmitigable visual impacts because the site is in a rural area with open landscape, in immediate proximity to a scenic rural road (Metcalf Road). In addition, staff expects that a transmission line along Metcalf Road would cause significant unmitigable visual impacts to travelers and to the numerous residences along the road.

SITE C

Placement of utility routes related to use of Site C could cause unavoidable direct impacts to special-status species. The site is located in unincorporated Santa Clara County, and is zoned Residential. Use of the site would require a General Plan amendment and a zoning change, as would the proposed project. However, staff's field visit revealed that Site C is also adjacent or nearly adjacent to almost a dozen homes, so its use for a power plant would be incompatible with this existing residential use, both because staff expects that it would cause significant unmitigable noise and visual impacts and because it would physically divide an existing neighborhood. Finally, a home has recently been constructed on approximately one quarter of the site.

STAFF'S ALTERNATIVE SITES ALT-1 THROUGH ALT-6

AIR QUALITY

ANALYSIS

This analysis discusses the implications of locating the proposed Metcalf Energy Center at various alternative sites and compares them in general to the proposed site with respect to air quality. Project-related emissions are generated during facility construction and operation. If not mitigated, emissions from the Metcalf project would add to existing ozone and PM10 violations and produce significant adverse impacts. However, the project's emissions will be fully mitigated by Calpine/Bechtel providing offsets and implementing mitigation measures. Calpine/Bechtel proposed certain offsets in the PDOC to mitigate NOx and VOC as precursors to ozone. Calpine/Bechtel is committed to provide PM10 offsets/mitigation, but has not yet identified the sources of offsets. The following is a basic comparison of alternative sites. Air emission dispersion modeling for each site may be necessary to accurately predict the extent of differences in public exposure to project emissions.

The quantity of air emissions from the operation of the facility would be the same at any site, because they are a function of the project design and operation.

All of the six alternative sites are located in the same Air District (Bay Area Air Quality Management District) as the proposed project. Therefore, all applicable rules to the proposed site would apply to all alternative sites. The mitigation/offsets requirements for the New Source Review regulations, BACT analysis, and permit conditions will be the same for all six sites and the proposed site.

The topography is different between the proposed site location and sites 1 to 4. Alternative sites 1 to 4 are located in relatively flatter areas that may help to better disperse the project emissions. However, the predominant wind direction is from the northwest, the same as for the proposed location. Therefore, the impact of locating the project at any of the four sites would add to the air quality violations in the San Jose area. Alt. Sites 5&6 are closer to hills, similar to the proposed site.

Sites Alt-1, 2, 3, and 4 are all within about one-half mile of residences, as is the proposed Metcalf site. This suggests that the exposure to the maximum impacts at these sites would be similar to the proposed site. Sites Alt-5 and 6 are within about one mile of residences, however, the impacts are not clear compared to the proposed site. Impacts are not necessarily less for Alt. 5 and 6 because residents are farther from the source.

Sites Alt-1, 2, 3, and 4 are located relatively close to industrial areas similar to the proposed project location, which can make potential offset sources available to mitigate the project emissions. On the other hand, Alt-5 and Alt-6 are farther from offset sources. However, for the Air District, as long as the offsets are obtained from the District's air basin, the Air District's regulations are satisfied. Therefore, the offsets issue is essentially the same for all of the sites.

Staff has not arrived at final conclusions regarding the significance of impacts from short-term/long term exposure to project emissions at the proposed Metcalf site. Short-term impacts may depend more on site-specific differences in the locations of sensitive receptors, although dispersion modeling would be necessary to confirm this for each alternative site. Sites Alt-5 and 6 could have less potential for significant short-term health impacts, since residences are somewhat farther away at these two locations.

BIOLOGICAL RESOURCES

ANALYSIS

Staff conducted a preliminary analysis of biological resources potentially present at six alternative sites for the MEC project. This analysis is based on a cursory review using aerial photographs and the California Natural Diversity Data Base. Staff did not visit the sites. Staff then compared the alternative sites to the proposed site.

The Proposed Project

The proposed MEC project may have significant indirect and cumulative impacts to biological resources from NOx deposition on serpentine habitats. The analysis of impacts and potential mitigation is still under review, pending further information from the applicant. Once it is completed, an evaluation of alternatives in relation to the proposed project can be completed.

Alt-1 and Alt-2

Site Alt-1 is disked agricultural land. Site Alt-2 consists of agricultural lands and structures, such as greenhouses and farms. These sites are about two miles southeast of the San Francisco Bay National Wildlife Refuge (Alviso Unit) and about 1000 feet west of Coyote Creek.

Sites Alt-1 and Alt-2 are adjacent to lands identified for PG&E's proposed Los Esteros Substation and have existing gas lines running through the properties. Water supply and discharge pipelines would travel along existing roads to the San Jose/Santa Clara Water Pollution Control Plant.

The sites proper and linear facilities are not expected to have any direct effect on listed plant or wildlife species.

The area is outside of the range of serpentine soils. Therefore, use of either site Alt-1 or Alt-2 should not cause the indirect impact of NOx deposition on serpentine habitat.

Alt-3 and Alt-4

Site Alt-3 consists of grassland, an evaporation pond, and shrubs which appear to have been planted as a visual screen around the pond. A transmission line would run about one mile along existing roads to the Newark Substation and would be placed either aboveground or underground. The 1.5-mile gas line would follow a transmission line easement along roads, including 0.5 miles through a residential area. Water lines would follow roads with the exception of about 0.5 miles, which would run through agricultural land.

Site Alt-4 has been disked and supports grasses that may be periodically harvested. The transmission line would either use existing towers of a 115 kV line or run underground for 2.5 miles. Existing gas lines are within several hundred feet of the site. Pipelines for supply water (7 to 11miles) and wastewater (6 to 11 miles) would follow existing roads.

Because the sites are disturbed, the linear facilities short and along existing roads, and the areas are not located near serpentine habitats, no direct or indirect significant impacts are expected.

Alt-5 and Alt-6

Sites Alt-5 and Alt-6 are located in rural eastern Alameda County. These sites support foothill grassland and likely have vernal pools and/or seasonal wetlands. Such wetlands could support listed fairy and tadpole shrimp. Creeks could support California red-legged frogs and foothill yellow-legged frogs. Listed plants including large-flowered fiddleneck could be present. These sites are also within the range of, and support habitat for, San Joaquin kit fox and western burrowing owl. Several protected resident and migratory species use this area for foraging.

The length of the gas line and transmission line would be minimal. The water source may be the California Aqueduct or the Delta-Mendota Canal which could result in Delta smelt, Sacramento splittail, and other fisheries issues.

Use of site Alt-5 or Alt-6 could result in impacts to listed species. Many of these impacts may be mitigable to less than significant levels. Mitigation of the loss of San Joaquin kit fox habitat would require off site compensation. However, in the event kit fox are observed, the impacts may be significant and unmitigable due to rare occurrences in this portion of their range. Use of site Alt-5 or Alt-6 would not affect serpentine habitat.

CONCLUSION

Staff's preliminary analysis of biological resources of the proposed project indicates that the project's indirect and cumulative impacts to serpentine habitats would be significant. As indicated above, mitigation for these impacts is still unresolved, pending further information from the applicant.

Sites Alt-1, Alt-2, Alt-3 and Alt-4 are preferable to the proposed project because their use would have no direct or indirect significant impacts to biological resources and would avoid the potential significant impacts of the proposed project on serpentine habitat.

Sites 5 and 6 support habitat for several listed species. If San Joaquin kit fox are found to occur at Sites 5 or 6, use of the site for the power plant could cause a significant impact that may be unmitigable. A complete and accurate determination of potential impacts to listed species would require field surveys completed at the appropriate time(s) of year. Given the potential for significant and possibly unmitigable impacts from both the proposed project and the use of site Alt-5 or Alt-6, these sites are considered approximately equal in regard to impacts on biological resources.

CULTURAL RESOURCES

INTRODUCTION

Unknown and previously unrecorded cultural resources may be present at or below the surface at the proposed and the alternative power plant sites and/or along the routes presented for the linear facilities needed to supply or service the project sites. Construction of a power plant and linear facilities would involve clearing of the ground surface and excavation and trenching below the surface. Any cultural resources present could be damaged or destroyed during such construction activities. A number of cultural resource mitigation measures are typically included with any permits granted for project construction in particularly sensitive resource areas. Frequently these measures include monitoring of construction activities by qualified cultural resource professionals. The Energy Commission typically adopts such measures in its certification of a project and then oversees project construction and operation to ensure that these measures are implemented so that potential impacts to cultural resources will be mitigated to a less than significant level.

ANALYSIS

The Proposed Project

The applicant has had a record search performed and has had the proposed project site and the routes for the proposed linear facilities surveyed. The record search and surveys show many cultural resources in the vicinity of the proposed project. This indicates that other as yet undiscovered cultural resources may be present, particularly beneath the present-day ground surface. Both prehistoric and historic resources have been recorded in the vicinity of the project.

Use of each alternative site would necessitate the use of several different routes for the linear facilities needed to serve each project site. Project-related linear facilities include a natural gas supply pipeline, a water supply pipeline, a potable water supply pipeline, a wastewater disposal pipeline, and an electric transmission line. For some of the linear routes, there is more than one potential source of supply, leading to alternative routes for the service being carried. Refer to the Description of the Alternatives for maps showing the various routes.

Alternative Site Evaluation Approach

This cultural resource assessment of alternative sites focuses on the topographic relationship between the alternative site and natural features and resources, the proximity of the alternative site to the location of known archaeological resources, and the type and extent of these known resources.

Record Search for Alternative Sites and Comparison of Resource Potential

Staff requested an archaeological record search by the Northwest Information Center [part of the California Historic Resource Information System (CHRIS)] at Sonoma State University. The summary report on the record search indicates that over one hundred archaeological studies have been carried out within one-quarter mile of the alternative project areas. Within the areas surveyed, a total of 52 archaeological finds (sites, structures, and isolates) have been found within one quarter-mile of the alternate project areas identified by staff. Generally, areas located near the margins of the marshes along the southern reaches of the San Francisco Bay, have been the subjected to more studies and contain the majority of the known resources. Areas to the east, into the hills of the coastal range, have been less studied and less is known about the resource potential (NW CHRIS 2000a).

The CHRIS considers the coastal portions of the project alternatives study area to be sensitive for prehistoric material even when there is no surface component visible. Many of the sites in the coastal areas have been buried under alluvium deposited by storm tidal patterns or during seasonal flooding. Southern Alameda County and northern Santa Clara County, in the vicinity of the San Francisco Bay, are rich in useable land and resources and they have a long pattern of prehistoric and historic human use. Numerous already-known cultural resources have been found both on the surface and beneath the surface. The nearness of the bay; the presence of the rivers, streams and creeks, marshes and wetlands; the form of sheltering hills and valleys; and the abundance and variety of necessary resources all indicate that there is a potential that prehistoric and historic resources may be encountered and disturbed by the proposed project, as well as use of alternative sites 1, 2, 3, and 4, and the routes for their linear facilities.

The topography and environmental conditions on the eastern side of the coastal hills, where sites 5 and 6 are located, led the CHRIS to describe the potential for cultural resources to be present as “intermittent” and to generally consider the area to be less sensitive for cultural resources than the area containing alternative sites Alt-1, 2, 3, and 4.

Alt-1

The Alternative 1 site has not been surveyed but 17 surveys have been conducted within one-half mile of the site. The CHRIS considers the site vicinity to be sensitive for buried prehistoric remains but to have a low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of six known prehistoric sites, including four with burials, within one-half mile of the power plant site, indicates that this alternative has a greater potential for impacts to cultural resources than the proposed project or alternative sites Alt-5 and Alt-6 and their linear routes.

Alt-2

The Alternative 2 site has been surveyed and 17 surveys have been conducted within one-half mile of the site. The CHRIS considers the site vicinity to be sensitive for buried prehistoric remains but to have a low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of six known prehistoric sites, including four with burials, within one-half mile of the power plant site, indicates that this alternative has a greater potential for impacts to cultural resources than the proposed project or alternative sites Alt-5 and Alt-6 and their linear routes.

Alt-3

The Alt-3 site area has previously been surveyed and numerous surveys have been conducted in the vicinity of the site and along the potential linear routes. The CHRIS considers the site area to be sensitive for buried prehistoric remains but to have a low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of several recorded prehistoric sites, including burials, along a section of the eight-mile route for the recycled water supply line and the wastewater disposal line, plus the greater length of the transmission lines indicate that this alternative has greater potential for impacts to cultural resources than the proposed project or sites Alt-5 and Alt-6 and their linear routes.

Alt-4

The Alt-4 site area has not been previously surveyed but numerous surveys have been conducted in the vicinity of the site and along the potential linear routes. Although no significant cultural resources were found, the CHRIS considers the site area to be sensitive for buried prehistoric remains but to have low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of several recorded prehistoric sites, including burials, along a section of the eleven-mile route for the recycled water supply line and the wastewater disposal line, plus the greater length of the transmission lines indicate that this alternative has greater potential for impacts to cultural resources than the proposed project or sites Alt-5 and Alt-6 and their linear routes.

Alt-5

The Alternative 5 site has not been previously surveyed but seven surveys have been conducted on lands adjoining the parcel to the west and north. Three historic resource sites were recorded during these surveys, two of them located less than 1,000 feet from this alternative site. Based on the previous surveys, the location, and other environmental factors, the CHRIS considers the area around site Alt-5 to have a low potential for prehistoric resources. However, the CHRIS considers the site area to have a high sensitivity for historic resources.

A transmission line would be very short because the site is adjacent to the Tesla substation. Similarly, a gas line would be very short because a gas line runs through the substation property. Information on the potential route for a water/wastewater pipeline from the Alt-5 site to the treatment facility in Tracy was unavailable. A record search has not been completed for the water and wastewater lines in San Joaquin County and no information was available on known cultural resources along these routes. Generally, because Alt-5 has a lower potential for prehistoric resources than the proposed project, it has a lower overall potential for impacts to cultural resources than the proposed project and Alternatives Alt-1, 2, 3, and 4.

Alt-6

The Alt-6 site has previously been surveyed and no significant cultural resources were found. The area around the site has been the subject of seven previous surveys and three historic resource sites have been recorded within one-quarter mile of this alternative site. Based on the previous surveys, the location, and other environmental factors, the CHRIS considers the area around site Alt-6 to have a low potential for prehistoric and historic resources.

A transmission line would be very short because the site is adjacent to the Tesla substation. Similarly, a gas line would be very short because a gas line runs through the substation property. Information on the potential route for a water/wastewater pipeline from the Alt-5 site to the treatment facility in Tracy was unavailable. A record search has not been completed for the water and wastewater lines in San Joaquin County and no information was available on known cultural resources along these routes. Generally, Alt-6 has a lower potential for impacts to cultural resources than the proposed project and Alternatives Alt-1, 2, 3, 4, and 5.

Summary

The available information indicates in regard to the likelihood of encountering cultural resources that:

1. There is a similar likelihood that cultural resources could be encountered for sites Alt-3 and Alt-4 and their linear routes;

2. There is a similar likelihood that cultural resources could be encountered for sites Alt-1 and Alt-2 and their linear routes;

3. There is a greater likelihood that cultural resources could be encountered for sites Alt-3 or Alt-4 and their linear routes than for sites Alt-1 or Alt-2 and their linear routes;

4. There is a greater likelihood that cultural resources could be encountered for Alt-1, 2, 3, or 4 and their linear routes than for the proposed project.

5. Site Alt-5 and its linear routes have less likelihood to encounter cultural resources than the proposed project or Alt 1, 2, 3, or 4; and

6. Site Alt-6 and it is linear routes have less likelihood to encounter cultural resources than the proposed project or any of the other five alternative sites and their linear routes.

The relative potential to encounter cultural resources is illustrated in the following table:

Sites Alt-1, Alt-2, Alt-3, and Alt-4 and their linears	Proposed Project	Site Alt-5 and its linears	Site Alt-6 and its linears
Highest Potential ←			**→ Lowest Potential**

CONCLUSIONS

Project development at any of the alternative project locations, as well as the proposed location, has the potential to encounter previously unknown cultural resources and cause significant impacts. However, the potential for such impacts differs between the locations. The locations for Alt-1, 2, 3, and 4 have more potential than the proposed project. The locations for site Alt-5 have less potential than the proposed project or the locations for Alt-1, 2, 3, or 4. The locations for Alt-6 have less potential than the proposed project or the locations for Alt-1, 2, 3, 4, or 5. Although the extent and nature of the unknown resources and impacts on them can only be imprecisely predicted in advance of construction-related ground disturbance, timely implementation of appropriate monitoring and mitigation measures would be likely to reduce such impacts to less than significant levels. Therefore, after implementation of mitigation, the expected impact to cultural resources would be less than significant for the proposed project and all of the six alternative locations.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

ANALYSIS

For the purposes of this analysis, the elements of the project located within the boundaries of the primary site location are considered to be the similar for all six alternative sites.

Alt-1

The site is located on fluvial (stream bed) deposits at the outer edge of an alluvial fan. The fluvial deposit is made up of sands, silt and clay. The depth to ground

water is approximately 5 to 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). No faults are known to cross the site. However, the Silver Creek fault trace is located approximately 3,900 feet southwest of the southwestern corner of the site. An unnamed fault is located approximately 600 east of the southeastern corner of the site. Neither the Silver Creek nor the unnamed fault are considered to be active faults. The closest active fault to the site is the Hayward fault, which is located approximately 3.5 miles east of the site. Due to the low amount of relief (approximately three feet) at the site, the potential for landsliding is considered to be insignificant.

Site Alt-1 is located approximately 800 feet west of Coyote Creek. The site has been designated as a 100 year flood zone with an underdetermined 100 year flood zone elevation. No permanent surface water bodies exist on the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-2

Site Alt-2 is located on fluvial (stream bed) deposits at the outer edge of an alluvial fan. The fluvial deposit is made up of sands, silt and clay. The depth to ground water is approximately 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). No faults are known to cross the site. However, the Silver Creek fault trace is located approximately 3,200 feet west of the southwestern corner of the parcel. An unnamed fault is located approximately 1,000 east of the southeastern corner of the parcel. The closest active fault to the site is the Hayward fault, which is located approximately 3.5 miles east of the site. Due to the low amount of relief (approximately three feet) at the site, the potential for landsliding is considered to be insignificant.

The site is located approximately 1,200 feet west of Coyote Creek. The site has been designated as a 100 year flood zone with an underdetermined 100 year flood zone elevation, flood zone "A." No permanent surface water bodies exist on the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-3

Site Alt-3 is located on alluvium. The depth to ground water is approximately 5 to 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). There are no known faults that cross the site; however, the Silver Creek fault is located approximately 1 mile to the west. The closest active fault is the Hayward fault, which is located approximately 4.5 miles to the east. Due to the low amount of relief at the site, the potential for landsliding is considered to be insignificant.

The site is located in flood zones "A0" (areas where the 100 year flood average depth is between 1 and three feet) along the eastern edge of the parcel and "C" (areas of minimal flooding) in the rest of the parcel. No permanent surface water bodies exist on the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-4

Site Alt-5 is located on alluvium. The depth to ground water is approximately 5 to 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). No known faults cross the site. The closest active fault to the site is the Hayward fault, approximately 2.5 miles to the east. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. Due to the low amount of relief at the site the potential for landsliding is considered to be insignificant. No significant paleontological resource locations and no geological resources are known to exist at the site.

The site is located in flood zone "C" (an are of minimal flooding). No permanent surface water bodies exist on the parcel.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-5

Surface geology of site Alt-5 is made up of mainly Quaternary Alluvium in valley bottoms and Miocene age marine sandstone of the Neroly formation. Locally, the

Neroly formation sandstone dips 5 degrees to the east. The depth to ground water is unknown. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. No significant landslides are known to exist on or immediately adjacent to the site. The potential for landslides at the site is considered to be low due to the shallow dip of the sandstone and the lack of existing landslides.

The Midway fault trace projection crosses the site under alluvium. The Midway fault is not considered active but has been documented to displace Pleistocene age strata. This indicates that, depending upon placement of the power plant on the parcel, fault rupture is a significant consideration in evaluating this site. The Greenville fault, located approximately 4.8 miles west of the parcel, would be considered the fault associated with the design earthquake from strong ground shaking, because it is active and is capable of generating a much larger earthquake than the Midway fault.

The site is located in flood zone "C." No permanent surface water bodies exist on the parcel.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-6

Site Alt-6 is located on Miocene age marine sandstone of the Neroly formation, an unnamed tan colored sandstone of Miocene age and Quaternary Alluvium. Locally, the sandstone dips from 5 to 17 degrees to the east or northeast. Valley bottoms are covered with Quaternary Alluvium. The depth to ground water is unknown. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. Since the majority of this site is located on sandstone, for discussion purposes a mat foundation for larger facilities may be the first choice for this site, should site specific conditions allow it. No significant landslides are known to exist on or immediately adjacent to the parcel. The potential for landslides at the site is considered to be low due to the shallow dip of the sandstone and the lack of existing landslides. The closest known faults to the site are an unnamed fault within 0.5 miles southwest of the southwestern western limits of the parcel, and the Midway fault, which is located approximately 400 feet east of the northeastern corner of site. The Midway fault is not considered active but has been documented to displace Pleistocene age strata. The Greenville fault is located approximately 4.3 miles west of the parcel and is considered the fault associated with the design earthquake from strong ground shaking, because it is active and is capable of generating a much larger earthquake than the Midway fault. The footprint for the primary MEC site location is not crossed by known faults, therefore surface rupture due to faulting is considered unlikely.

The site is located in flood zone “C,” an area of minimal flooding. No permanent surface water bodies exist on the parcel.

No significant paleontological resource locations and no geological resources are known to exist at the site; however, Diblee (Diblee 1980) indicated that a tan unnamed Miocene age sandstone outcrops in the southwestern corner of the parcel. This sandstone is indicated in the legend of Diblee’s map to be of a marine origin and fossiliferous.

Summary

The proposed MEC power plant site and alternative sites ALT-1 through ALT-4 and a portion of sites ALT-5 and ALT-6 are located on alluvium or fluvium. The western portion of ALT–5 is located on sandstone. The balance of ALT-5 is located on alluvium. ALT-6 is located on sandstone, but is covered by alluvium in the southern portion of the site. None of the sites (alternative sites ALT-1 through ALT-6 or the MEC primary site) are located on active faults. All six alternative sites and the primary MEC site are located in seismic zone 4 as delineated in the California Building Code.

Site Alt-1 has been designated as a 100 year flood zone with an underdetermined 100 year flood zone elevation. Site Alt-2 has been designated as a 100 year flood zone with an underdetermined 100 year flood zone elevation, flood zone “A.” Site Alt-3 is located in flood zones “A0” (areas where the 100 year flood average depth is between 1 and three feet) along the eastern edge of the parcel and “C” (areas of minimal flooding) in the rest of the parcel. Sites Alt-4, Alt-5, and Alt-6 are located in flood zone “C,” an area of minimal flooding. No permanent surface water bodies exist on any of the sites.

No significant paleontological resource locations and no geological resources are known to exist at any of the alternative sites.

CONCLUSIONS

None of the six alternative power plant sites are significantly better or worse than the proposed power plant site in regard to geological hazards, geological resources, or paleontological resources. Depending upon the alignment of linear facilities for an alternative site, there may or may not be cause for concern with crossing of active faults. The Energy Commission staff did not have adequate time to review the applicant’s surface water hydrologic analysis for the proposed power plant site that was requested by the Santa Clara Valley Water District in October 1999. Until this analysis has been reviewed by both the Santa Clara Valley Water District and the Energy Commission staff, staff will offer no assessment regarding mitigation of potential surface water issues with respect to relocation of the proposed project to one of the alternative sites.

LAND USE

ANALYSIS

Alt-1

Site Alt-1 is located in an unincorporated area of Santa Clara County but within the City of San Jose's Urban Service Area. Site Alt-1 consists of the northwest 13 acres of a 66.46-acre parcel. The site is currently in agricultural use and designated as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County compiled by the California Department of Conservation (CDC, 1999a). The remainder of the parcel is in agricultural use and contains two small farmhouses located about 2,200 feet and 2,450 feet from site Alt-1 in the southeast portion of the 66.46-acre parcel. Site Alt-1 is designated Light Industrial by the City of San Jose General Plan and zoned Light Industrial (M-1).

The San Jose/Santa Clara Water Pollution Control Plant is located to the northwest of site Alt-1. Other nearby land uses include vacant land planned for Public/Quasi Public uses to the west, and land currently used for agriculture and planned for light industrial use to the east. About 1,150 feet east of site Alt-1 and east of Coyote Creek in the City of Milpitas is undeveloped land planned for residential, commercial, and research and development/office uses (PG&E, 1998). Sensitive land uses in the vicinity of site Alt-1 include buildings on the parcel to the south that house residents engaged in agricultural work, a residential trailer park located about 0.5 mile to the southwest, and residential neighborhoods located about 0.75 mile to the southwest, about 1 mile to the east across Interstate 880 in the City of Milpitas, and about 1.5 miles to the west in the community of Alviso.

Comparison to Proposed Project

The Light Industrial designation is intended for a wide variety of industrial uses, excluding uses with unmitigated hazardous or nuisance effects (San Jose, 1994). Similar to the proposed site, the City of San Jose recommended to Calpine/Bechtel that for a power plant at site Alt-1 a General Plan amendment should be requested to change the Light Industrial designation to Public/Quasi-Public. In addition, power plants are prohibited uses in the Light Industrial zoning district, so site Alt-1 would require a zoning change as well (San Jose, 1997). To change the Light Industrial designation of site Alt-1 to allow a power plant would not be as substantial of a change as it would be to change the Campus Industrial designation of the proposed site. The City's industrial land use designations are intended to accommodate a variety of uses. In ascending order of level of intensity in terms of permitted uses and environmental effects, the industrial designations are as follows: Research and Development; Campus Industrial; Research, Development, and Administrative Office; Industrial Park; Light Industrial; and Heavy Industrial. A power plant is most appropriately defined as a "heavy industrial" use. It would be more similar in character to Light Industrial uses than to Campus Industrial uses. A power plant at site Alt-1 would not have inconsistencies in regard to detailed design guidelines that the proposed project has with the North Coyote Valley Campus Industrial Area Master Development Plan and the Riparian Corridor Policy Study.

Similar to the proposed project, a power plant at site Alt-1 would not disrupt or divide the physical arrangement of an established community since land in the immediate vicinity is either undeveloped or used for agriculture and a few residences.

Since a power plant at site Alt-1 would be adjacent to the proposed Los Esteros Substation, an electrical interconnection line would not disrupt or divide the physical arrangement of an established community. This is similar to the proposed project, which involves a short interconnection line traversing undeveloped grazing land between the MEC site and an existing transmission line tower on Tulare Hill.

Development at site Alt-1 would have a significant impact on agriculture as the proposed site would, since 13 acres of Prime Farmland would be converted to non-agricultural use.

Staff does not expect that a power plant at site Alt-1 would cause significant adverse land use incompatibilities, such as unmitigated noise, public health, traffic, or visual impacts. Therefore, use of site Alt-1 would avoid the potential land use compatibility impacts of the proposed project in regard to noise and the unmitigable impacts to visual resources. PG&E's construction of its Los Esteros Substation is a prerequisite for use of site Alt-1. The substation would remove residences close to the southern edge of site Alt-1 and create a buffer between the site and any remaining residences north of Highway 237, the closest of which would be about 1,300 feet from site Alt-1.

Alt-2

Site Alt-2 is located in an unincorporated area of Santa Clara County but within the City of San Jose's Urban Service Area. Site Alt-2 consists of the southern 30 acres of a 54.6-acre parcel. Greenhouses, agricultural facilities, and buildings that house residents engaged in agricultural work currently occupy the entire parcel. The site is designated as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County (CDC, 1999a). Site Alt-2 is designated Light Industrial by the City of San Jose General Plan and zoned Light Industrial (M-1).

Nearby land uses include vacant land planned for Public/Quasi-Public uses to the west, and land currently used for agriculture and planned for light industrial use to the east. About 1, 500 feet east of site Alt-2 and east of Coyote Creek in the City of Milpitas is undeveloped land planned for residential, commercial, and research and development/office uses. Sensitive land uses in the vicinity of site Alt-2 include two farmhouses located about 330 feet and 980 feet to the east, a residential trailer park located about 1,000 feet to the southwest across Highway 237, and residential neighborhoods located about 0.5 mile to the southwest, about 1 mile to the east across Interstate 880 in the City of Milpitas, and about 1.75 miles to the west in the community of Alviso.

Comparison to Proposed Project

As discussed above for site Alt-1, to change the Light Industrial designation of site Alt-2 to allow a power plant would not be as substantial of a change as it would be to change the Campus Industrial designation of the proposed site. A power plant at site Alt-2 would not have inconsistencies in regard to detailed design guidelines that the proposed project has with the North Coyote Valley Campus Industrial Area Master Development Plan and the Riparian Corridor Policy Study.

Similar to the proposed project, a power plant at site Alt-2 would not disrupt or divide the physical arrangement of an established community since land in the immediate vicinity is either undeveloped or used for agriculture and a few residences.

Site Alt-2 would be adjacent to the proposed Los Esteros Substation. Therefore, similar to the proposed project, an electrical interconnection line would not disrupt or divide the physical arrangement of an established community.

Development at site Alt-2 would have a significant impact on agriculture as the proposed site would, since 30 acres of Prime Farmland would be converted to non-agricultural use.

Development of a power plant at site Alt-2 would require demolition of at least one residence. This would not result in a significant displacement of housing units or people.

Staff does not expect that a power plant at site Alt-2 would cause significant adverse land use incompatibilities, such as unmitigated public health, traffic, or visual impacts. Therefore, use of site Alt-2 would avoid the potential land use compatibility impact of the proposed project in regard to the unmitigable impacts to visual resources. PG&E's construction of its Los Esteros Substation is a prerequisite for use of site Alt-2. The substation would remove nearby residences on the northern portion of the 54.6-acre parcel. Two small farmhouses are located about 330 feet and 980 feet from the east property line of Site Alt-2. Site Alt-2 is a 30-acre site. Locating the noise generating components of the power plant in the northwest quadrant of the site would place the project about 1,000 feet from the nearest residence. This is essentially the same distance to the nearest residence as the proposed project. The remainder of the site could be used for other project elements and a buffer area, both of which would provide noise mitigation. Therefore, it would be technically feasible to mitigate noise impacts on the nearest residence to a less than significant level at either site Alt-2 or the proposed site.

Alt-3

Site Alt-3 is located on a parcel of land that is partially occupied by the existing Borden Chemical facility, which includes an existing 0.2 MW power plant. Site Alt-3 consists of the vacant portion of the parcel. The property is currently designated General Industrial by the City of Fremont General Plan, and is zoned General Industrial. Adjacent land uses are industrial, including a large Celotex manufacturing plant and warehouses. An industrial park is being constructed on

property located about 1,000 feet west of Alt-3 in the City of Newark. Nearby sensitive land uses include a residential area located about 1,200 feet northwest of site Alt-3 in the City of Newark. The Celotex industrial facility separates this residential area from the site. There are three schools located between two-thirds of a mile and one mile of site Alt-3 to the north and northeast and across Interstate 880.

Comparison to Proposed Project

The General Plan's General Industrial designation allows all types of industrial uses. Certain industries with significant environmental impacts (e.g., noise, or dust), nuisance or hazardous characteristics can only locate in areas with this designation (Fremont, 1991). Uses allowed with a conditional use permit in the General Industrial zoning district include manufacturing uses such as meat packing plants, poultry dressing plants, petroleum refining and related industries, and any other use which the planning commission finds is similar in nature, function, or operation to other conditional uses allowed within the district (Fremont, 1991). Uses permitted with a zoning administrator permit include electric, gas, and sanitary services, and the manufacturing of chemicals and allied products. The zoning administrator may also permit any other use that he finds similar in nature, function, and operation to other zoning administrator permitted uses within the district. Although a power plant is not specifically listed as a permitted or conditionally permitted use in the General Industrial district, the zoning ordinance provides ample discretion to allow such a use. Thus, unlike the proposed site, development of a power plant at site Alt-3 would not require rezoning of the site. It also would not require a General Plan amendment, unlike the proposed site.

Similar to the proposed project, the City of Fremont General Plan contains restrictions on building heights. General Industrial uses are restricted to a building height of 40 feet. Similar to the proposed project, the Fremont General Plan allows height exceptions. General Plan Policy LU 3.7 allows additional height based on the unique building requirements of a particular use. The need for 145-foot tall stacks to meet local air quality standards appears to fit this criterion for a height exception.

Similar to the proposed project, a power plant at site Alt-3 would not disrupt or divide the physical arrangement of an established community because the immediate area is primarily industrial and commercial. Since the site is currently vacant, a power plant would not displace any existing use.

Site Alt-3 is approximately one mile north of the Newark Substation. An electrical transmission interconnection route would be either aboveground or underground in city streets. Land uses along this route are all industrial. Therefore, similar to the proposed project, a transmission line would not disrupt or divide the physical arrangement of an established community.

Site Alt-3 contains soils classified as Farmland of Statewide Importance and Prime Farmland (USDA, 1981). However, site Alt-3 is not currently being used for agriculture and has not been used for the production of irrigated crops for at least

the last 6 years. Hence, site Alt-3 is designated as Urban on the 1998 Important Farmland Map for Alameda County (CDC, 1999b). The site is currently vacant and zoned for General Industrial uses. The site is surrounded by industrial and commercial uses, and would not likely be used for agricultural purposes. Therefore, use of site Alt-3 would have a less than significant impact on Important Farmland, and would avoid the unmitigable significant impact on Prime Farmland that the proposed project would cause.

Staff does not expect that a power plant at site Alt-3 would cause significant adverse land use incompatibilities, such as unmitigated noise, public health, traffic, or visual impacts. Therefore, use of site Alt-3 would avoid the potential land use compatibility impacts of the proposed project in regard to noise and the unmitigable significant impacts to visual resources.

Alt-4

Site Alt-4 consists of two parcels totaling 20.66 acres. The site is currently designated General Industrial by the City of Fremont General Plan, and is zoned General Industrial. The site is currently vacant. Surrounding land uses are industrial and commercial, including a lumberyard, a truck trailer and railcar storage yard, and a large RV storage yard. A huge GM/Toyota car manufacturing plant is approximately 0.5 mile to the south. Several residences are located east and southeast of site Alt-4. The closest of these residences is located about 325 feet from the east property line of site Alt-4 across Old Warm Springs Road within an orchard. The properties these residences are located on are zoned General Industrial. The Zoning Ordinance specifically prohibits residential uses in the General Industrial zoning district (Fremont, 1999). These residences presumably predate the zoning ordinance (i.e., they are nonconforming uses). Other sensitive land uses include a residential area located about 0.5 mile to the east and across Interstate 680, a residential area located about 0.75 mile to the north, and a school located about 4,500 feet to the northwest.

Comparison to Proposed Project

As discussed above for site Alt-3, although a power plant is not specifically listed as a permitted or conditionally permitted use in the General Industrial district, the zoning ordinance provides ample discretion to allow such a use. Thus, unlike the proposed site, development of a power plant at site Alt-4 would not require rezoning of the site. It also would not require a General Plan amendment, unlike the proposed site.

Similar to the proposed project, a power plant at site Alt-4 would not disrupt or divide the physical arrangement of an established community because the area is primarily industrial and commercial. Since site Alt-4 is currently vacant, a power plant would not displace any existing use.

Site Alt-4 is located approximately two miles northeast of PG&E's Newark Substation. One possible electrical transmission interconnection route would be overhead for approximately three miles, first along a corridor that contains an existing 115 kV transmission line then along another corridor that contains two 230

kV transmission lines and one 115 kV transmission line. Because this route would be within existing utility corridors, the route would not disrupt or divide the physical arrangement of an established community. A second possible route would be underground for approximately two miles in city streets. Such an underground line would not disrupt or divide the physical arrangement of an established community. Thus, similar to the proposed project, an electrical transmission line would not have a significant adverse land use impact.

Site Alt-4 contains soils classified as Prime Farmland and Farmland of Statewide Importance (USDA, 1981). However, site Alt-4 is not currently being used for agriculture. Since 1988, site Alt-4 has been designated either Urban or Other Land (lands which do not meet the criteria for any other category) on the Important Farmland Maps for Alameda County (CDC, 1999b). The 1998 Important Farmland Map designates the site as Other Land. The site is currently vacant and zoned for General Industrial uses. The site is surrounded by primarily industrial and commercial uses, and would not likely be used for agricultural purposes. Therefore, use of site Alt-4 would have a less than significant impact on Important Farmlands, in contrast to the significant effect on Prime Farmland that the proposed project would cause.

Staff does not anticipate that a power plant at site Alt-4 would cause significant adverse land use incompatibilities, such as unmitigated public health, traffic, or visual impacts. Therefore, use of site Alt-4 would avoid the potential land use compatibility impacts of the proposed project in regard to the unmitigable impacts to visual resources. Several residences are located east and southeast of site Alt-4, the closest of which is located about 325 feet from the east property line of site Alt-4. Site Alt-4 is a 20-acre site. Locating the noise generating components of the power plant in the western portion of the site would place those components about 1,000 feet from the nearest residence. This is essentially the same distance to the nearest residence as the proposed project. The remainder of the site could be used for other project elements and a buffer area, both of which would provide noise mitigation. Therefore, it would be technically feasible to mitigate noise impacts on the nearest residence to a less than significant level at either site Alt-4 or the proposed site.

Alt-5 and Alt-6

Site Alt-5 is located on a 49.53-acre parcel in rural eastern Alameda County. The site is adjacent to the north side of PG&E's Tesla Substation. Site Alt-6 is located on a 299.1-acre parcel adjacent to the northwest side of the Tesla Substation. Both sites are currently used for grazing. The western portion of site Alt-6 is also used for wind energy production. Surrounding land is used for grazing and wind energy production.

Sites Alt-5 and Alt-6 are both designated Large Parcel Agriculture by the Alameda County General Plan, and zoned A-B-E, which requires parcels to be a minimum of 160 acres unless they were created before 1972. The minimum parcel size on which building is allowed is 160 acres, also with an exception for parcels created before 1972. The parcel for site Alt-5 was created before 1972. Uses allowed by

the Large Parcel Agriculture General Plan designation include low intensity agricultural uses (such as alfalfa, cattle and horse grazing), high intensity agricultural uses (such as row crops and vineyards), windfarms and related facilities, utility corridors, and other industrial uses appropriate for remote areas and determined to be compatible with agriculture (Alameda County, 1994). According to Alameda County planning staff, a power plant would be considered a public utility, which is an allowed use in any zoning district.

Comparison to Proposed Project

Unlike the proposed site, a power plant at sites Alt-5 or Alt-6 would not require a zoning change since power plants are an allowed use in any zoning district. Because a power plant would be compatible with grazing, use of sites Alt-5 or Alt-6 would not require a General Plan amendment.

Similar to the proposed project, a power plant at sites Alt-5 or Alt-6 would not disrupt or divide the physical arrangement of an established community since agricultural uses predominate in the area.

Sites Alt-5 and Alt-6 are adjacent to the Tesla Substation. Therefore, similar to the proposed project, an electrical interconnection line would not disrupt or divide the physical arrangement of an established community.

Sites Alt-5 and Alt-6 consist of Prime Farmland and Farmland of Statewide Importance soils (USDA, 1966). However, sites Alt-5 and Alt-6 are designated Grazing Land on the 1998 Important Farmland Map for Alameda County (CDC, 1999b). Therefore, unlike the proposed site, development at sites Alt-5 or Alt-6 would not have a significant impact on Important Farmlands.

Staff does not expect that a power plant at sites Alt-5 or Alt-6 would cause significant adverse land use incompatibilities, such as unmitigated noise, public health, traffic, or visual impacts. Therefore, use of either sites Alt-5 or Alt-6 would avoid the potential land use compatibility impacts of the proposed project in regard to noise and the unmitigable impacts to visual resources.

CONCLUSION

The use of site Alt-1 would avoid some of the significant adverse land use impacts of the proposed project. While a power plant at site Alt-1 would require a General Plan amendment and zoning change, it would not have the inconsistencies in regard to detailed design guidelines that the proposed project has with the North Coyote Valley Campus Industrial Area Master Development Plan and the Riparian Corridor Policy Study. A power plant at site Alt-1 would be more similar in character to Light Industrial uses than to Campus Industrial uses near the proposed site. A power plant at site Alt-1 would avoid the potential land use compatibility impacts of the proposed project in regard to noise and the unmitigable impacts to visual resources.

The use of site Alt-2 would avoid some of the significant adverse land use impacts of the proposed project. While a power plant at site Alt-2 would require a General

Plan amendment and zoning change, it would not have the inconsistencies in regard to detailed design guidelines that the proposed project has with the North Coyote Valley Campus Industrial Area Master Development Plan and the Riparian Corridor Policy Study. A power plant at site Alt-2 would be more similar in character to Light Industrial uses than to Campus Industrial uses near the proposed site. A power plant at site Alt-2 would avoid the potential land use compatibility impacts of the proposed project in regard to the unmitigable impacts to visual resources. It would be feasible to mitigate noise impacts on the nearest residence to a less than significant level at either site Alt-2 or the proposed site.

The use of site Alt-3 would avoid all of the significant adverse land use impacts of the proposed project. A power plant at site Alt-3 would not require a General Plan amendment or zoning change. Use of site Alt-3 would avoid the significant adverse impact on Prime Farmland of the proposed project. A power plant at site Alt-3 would avoid the potential land use compatibility impacts of the proposed project in regard to noise and the unmitigable impacts to visual resources.

With mitigation, the use of site Alt-4 would avoid all of the significant adverse land use impacts of the proposed project. A power plant at site Alt-4 would not require a General Plan amendment or zoning change. Use of site Alt-4 would avoid the significant adverse impact on Prime Farmland of the proposed project. A power plant at site Alt-4 would avoid the potential land use compatibility impacts of the proposed project in regard to the unmitigable impacts to visual resources. It would be feasible to mitigate noise impacts on the nearest residence to a less than significant level at either site Alt-4 or the proposed site.

The use of either sites Alt-5 or Alt-6 would avoid all of the significant adverse land use impacts of the proposed project. A power plant at either site Alt-5 or site Alt-6 would not require a General Plan amendment or zoning change. Use of either site would not have a significant impact on Important Farmlands. A power plant at either sites Alt-5 or Alt-6 would avoid the potential land use compatibility impacts of the proposed project in regard to noise and the unmitigable impacts to visual resources.

NOISE

ANALYSIS

It is technically and, typically, economically feasible to mitigate power plant noise impacts to a level of insignificance. The chief factor in determining the cost, and thus the feasibility, of this mitigation is the distance to the nearest sensitive noise receptor.[1] The nearest receptor to the proposed project site is a farm residence approximately 1,150 feet south of the site. The proposed project would mitigate noise emissions to a level of insignificance at this residence.

[1] Sensitive receptors include residences, schools, libraries, hospitals, places of worship and any other uses for which quiet is important.

Alt-1

This site is currently in agricultural use. The nearest sensitive noise receptor that would remain after development of the proposed Los Esteros Substation is approximately 1,300 feet distant.

Alt-2

This site is also currently in agricultural use. The nearest sensitive receptor that would remain after development of the proposed Los Esteros Substation is approximately 330 feet from the site boundary. Site Alt-2 is large enough (30 acres) to locate the noisier power plant elements approximately 1,100 feet from the closest sensitive receptor.

Alt-3

This site lies adjacent to a Borden Chemical facility in Fremont. The nearest sensitive receptor is approximately 1,000 feet distant.

Alt-4

This site lies in an industrial and commercial neighborhood in Fremont. The nearest sensitive noise receptor is approximately 324 feet distant. Site Alt-4 is large enough (over 20 acres) to locate the noisier power plant elements approximately 1,100 feet from the closest sensitive receptor.

Alt-5

This site lies in a rural portion of Alameda County. There are no sensitive noise receptors within range of any power plant noise emissions.

Alt-6

This site also lies in a rural portion of Alameda County. There are no sensitive noise receptors within range of any power plant noise emissions.

CONCLUSIONS

The nearest sensitive noise receptors at alternative sites Alt-1 and Alt-3 are effectively the same distance from the project as is the nearest receptor at the proposed site. Sites Alt-2 and Alt-4 are large enough to allow noisier power plant elements to be located approximately the same distance from the closest sensitive receptor as for the proposed site. 1,100 feet from the nearest receptor. Mitigating project noise emissions to a level of insignificance at these four sites would thus cost approximately the same as at the proposed site, and is therefore assumed to be feasible.

The nearest sensitive receptors at alternative sites Alt-5 and Alt-6 are so far away as to be effectively nonexistent. Mitigation of project noise emissions to a level of insignificance at these sites would thus be cheaper than at the proposed site, and therefore feasible.

Since after mitigation no significant adverse noise impacts are to be expected at either the proposed site or at any of the alternative sites, all seven sites are considered equal in regard to noise impacts.

PUBLIC HEALTH

ANALYSIS

Public health impacts due to power plants are generally due to air emissions. Project-related are emissions are generated during facility construction and operation.

Construction

Construction of the proposed project would result in diesel exhaust emissions from heavy equipment. These emissions have the potential to cause short-term health effects. The type, duration, and amount of diesel exhaust from construction of the facility itself would be about the same regardless of project location. However, site-specific differences in hazardous substance contamination could affect the level of remediation required, resulting in differences in quantities of diesel exhaust from earth moving equipment.

Site specific differences in the location of sensitive receptors such as residential areas and schools could affect the public's exposure to the toxic substances contained in equipment exhaust. Sites Alt-1, 2, 3, and 4 are all within about one-half mile of residences, as is the proposed Metcalf site. Sites Alt-5 and 6 are within about one mile of residences. Air emission dispersion modeling for each site is necessary to accurately predict differences in public exposure to diesel exhaust, but sites Alt-5 and 6 could have the lowest potential, since they are farthest from residences. Conversely, sensitive receptors nearest to sites Alt-3 and 4 may have the highest potential for exposure to diesel exhaust, since both of these sites are located in industrial areas, and may have the highest potential for existing contamination, which could require more use of heavy equipment for remediation. Unless there are individual residences very close to a proposed site, it is unlikely that construction emissions would cause significant health impacts at the proposed or alternative sites, because their concentrations tend to decrease within a short distance. If significant health effects are anticipated, mitigation measures such as exhaust emission controls or limiting the operation of heavy equipment may be considered to reduce the level of impact to below significance.

Operation

Hazardous substances emitted from routine operation will be substantially similar regardless of the location of the project, since such emissions are a function of facility design. The proposed Metcalf facility is not likely to result in significant long-term cancer or noncancer public health impacts. Although the location of sensitive receptors near a project site affects the public's exposure to toxic substances as discussed above, staff also believes it unlikely that there would be significant impacts to public health from long-term exposure to facility emissions at any of the alternative sites.

Health impacts from short-term (acute) exposure to project operational emissions at the proposed Metcalf site are not likely to be significant. The magnitude of short-term impacts depend on site-specific differences in the locations of sensitive receptors. However, staff believes that significant impacts at any of the alternative sites would be unlikely, although dispersion modeling would be necessary to confirm this. Sites Alt-5 and 6 could have less potential for short-term health impacts, since residences are somewhat further away at these two locations.

CONCLUSION

The proposed project is not likely to cause significant adverse long-term health impacts (either cancer or noncancer) from exposure to toxic emissions, regardless of the site chosen. Short-term health impacts from both facility construction and operation may depend more on the location of nearby sensitive receptors. Staff believes it unlikely that health impacts would be significant at the proposed site or any of the alternative sites, but dispersion modeling at the alternative sites would be required to confirm this.

SOCIOECONOMICS

ANALYSIS

Most of staff's alternative sites are located in the northern San Jose and Fremont area and two sites are located near PG&E's Tesla substation in eastern Alameda County. The number of workers, construction costs, payroll, property tax revenues, and related items would be relatively the same. The majority of workers needed for construction would probably come from the San Jose/Santa Clara Valley though the Tesla sites might draw some workers from the Sacramento/Stockton area.

Staff assumes that, as noted in the Metcalf site analysis, workers would commute daily or weekly to the plant site. Some may move temporarily to the local area during construction. There could be some site-specific impacts in terms of housing, schools, utilities, and emergency services. If there were significant impacts identified, mitigation measures could be devised that would reduce these impacts to less than significant. For example, if there were a need for additional fire fighting equipment, such as is needed for the proposed site, staff would propose mitigation that would resolve the matter. Property tax revenues, payroll, and sales of necessary supplies would benefit the local community and the nearest metropolitan area.

The minority population within six miles of the proposed power plant site for 1999 was estimated to be 48 percent (Claritas 2000). After reviewing the U.S. Census Bureau data for Santa Clara and Alameda counties and the cities of San Jose, Fremont, Newark, Milpitas, and Tracy, it appears that there are significant minority or low-income populations near several of the alternative sites. Staff used 1990 census data regarding the minority population in the areas near the alternative sites. Sites Alt-1 and Alt-2 are in Santa Clara County, which has a 42 percent minority population. However, these sites are adjacent to the City of San Jose, which has a 45 percent minority population, and near the City of Milpitas, which has a 58 percent

minority population. Sites Alt-3 and Alt-4 are in Fremont, which has a 36 percent minority population. However, these sites are near the near Newark, which has a 42 percent minority population. Pockets of minority population greater than 50 percent may exist in the area of impacts due to placing the power plant at one of these sites. Further analysis would be necessary to determine if any such populations could be disproportionately impacted by the construction and operation of the power plant at these sites. The minority population in Alameda County is 47 percent but it is reasonable to assume that the eastern part of the county, near the Tesla substation, has a higher percentage of white persons. Also, very few people live in the vicinity. In comparison, Santa Clara County has a 42 percent minority population.

The low-income population in Alameda County is less than 20 percent (11.3 to 17.3 percent depending on age), while the corresponding figures for Santa Clara County range from 9.1 to 13.4 percent, based on age. These percentages are well below the 50 percent threshold as outlined in the latest U. S. Environmental Protection Agency's guidance for addressing environmental justice concerns (EPA 1998). Staff uses this document as a reference in analyzing environmental justice issues.

CONCLUSIONS

The socioeconomic impacts of the Metcalf Energy Center would be generally the same at the proposed site or any of the alternative sites. As noted in the socioeconomic assessment for the proposed site in south San Jose, construction activities with appropriate mitigation would probably not cause a significant impact on housing, schools, utilities, or emergency and other services at any of the alternative sites. Benefits from the construction and operation of the power plant regardless of its location include increases in the affected areas property and sales taxes, employment, and sales of service, manufactured goods and equipment.

SOIL AND WATER RESOURCES

ANALYSIS

The Proposed Project

The proposed MEC project would require three water systems: recycled water for cooling purposes; potable water for process, domestic, and back-up water needs; and an industrial wastewater discharge system for all plant wastewater.

Most of MEC's water demand would be required for cooling purposes. Estimated average use of water for cooling is 3.3 mgd[2] and estimated peak cooling water use is 4.7 mgd. The applicant proposes to use recycled water for cooling. The water would be obtained from the San Jose/Santa Clara Water Pollution Control Plant (WPCP) through the South Bay Water Recycling Program. The applicant proposes to use groundwater as a back-up cooling water supply should recycled water service be interrupted. The applicant has not yet decided on the purveyor of the

[2] Million gallons per day.

ground water so it is unclear what additional infrastructure may be required or what potential impacts may occur as a result of providing this water supply.

Potable water requirements for non-cooling industrial processes and domestic uses are estimated at 0.2 mgd on average with a peak requirement of 0.69 mgd. The applicant has not yet decided on the purveyor of the potable water supply so it is unclear what additional infrastructure may be required or what potential impacts may occur as a result of providing this water supply.

The applicant estimates peak wastewater discharge at 1.9 mgd for three cycles of concentration and 0.6 mgd for five cycles. The City of San Jose has indicated that this discharge would result in a three percent increase in the salinity concentration of the WPCP's recycled water product, and thus, poses a significant unmitigated adverse environmental impact.

Alt-1 and Alt-2

Sites Alt-1 and Alt-2 are located in north San Jose, just north of State Route 237, east of Zanker Road and west of Coyote Creek. Both of these sites are located close to the San Jose/Santa Clara WPCP, which would serve as the recycled water supply for these sites. A route to the treatment plant from site Alt-1 would be approximately 4,000 feet long, while a route from site Alt-2 would be approximately 6,000 feet long. Staff expects that back-up water supplies would be provided through San Jose Municipal Water System Division (MUNI) primarily from groundwater resources, much like the proposed project. Wastewater from plant operations would have the same characteristics as for the proposed project and would be the same amount. The only differences between the proposed project and use of sites Alt-1 and Alt-2 are the length of the linear supply and discharge lines.

Alt-3 and Alt-4

Sites Alt-3 and Alt-4 could be served by one of two potential sources of recycled water: South Bay Water Recycling (SBWR) or the Alameda County Union Sanitary District (USD) Alvarado Waste Water Treatment Plant (WWTP). A connection from Alt-3 to the SBWR's system could be made at a location approximately eight miles from the site. The closest connection to SBWR's system is approximately seven miles from Alt-4. In order for the SBWR Program to serve a project at a site in Fremont such as Alt-3 or Alt-4, the Alameda County Water District would need to support it and LAFCO approval may be required. Connection to the USD WWTP would require an approximately eight-mile pipeline for Alt-3 and an 11-mile pipeline for Alt-4.

Potable water to serve the non-cooling industrial processes and domestic requirements can be obtained from the Alameda County Water District system. The closest source of potable water for Alt-3 is approximately seven miles away (McGhie 2000), while potable water for Alt-4 could be obtained from a line adjacent to the site. These connections can not provide the amount of water necessary for back-up supplies when recycled water is not available and would need to be augmented by another supply (groundwater or a separate connection to another

line). It is questionable whether groundwater alone could supply the needed back-up requirements and further analysis would be required in the event this option is pursued.

If the recycled water is obtained from SBWR, the potential increased TDS levels in the wastewater product would be the same for Alt-3 or Alt-4 as for the proposed project. The impacts of this increase would be the same for Alt-3 or Alt-4 as for the proposed project and very similar if obtained from USD WWTP. However, discussions with the USD suggest that connection to the WWTP may not result in exceeding its discharge limits or violate any standard (Ernest 2000). Therefore, use of this alternative may avoid the potential significant adverse impact of the proposed project due to TDS, depending on the source of the water and where it is discharged.

Alt-5 and Alt-6

Water Supply and Wastewater

Sites Alt-5 and Alt-6 are located in rural eastern Alameda County near PG&E's Tesla Substation. Staff contacted Alameda County, San Joaquin County, and the City of Tracy to determine whether disinfected, tertiary-treated recycled water could be made available to a power plant located at either of these sites. Staff learned that water service to Alt-5 or Alt-6 would likely be provided by San Joaquin County or the City of Tracy. City of Tracy staff stated that at this time, no facility in the area of the sites is capable of producing the required quality or quantity of reclaimed water. The earliest any plans anticipate a facility to be capable of generating reclaimed water is a minimum of five years from now.

Staff investigated other options for water supply that included ground water from local existing wells or new wells and local water service from the City of Tracy or San Joaquin County. Staff has not investigated the use of irrigation return flow for use in cooling. Presently the City of Tracy uses groundwater. They also use surface water through a contract for a maximum of 10,000 acre-feet per year. Their system has a maximum treatment capacity of 25 mgd (10 mgd of well water and 15 mgd of surface water). Current demand on the City's potable water system is approximately 21 mgd. According to City of Tracy staff, the City's current system is insufficient to serve the entire water needs of a project such as MEC. It is possible that the City could provide water service for the peak potable non-cooling industrial processes and domestic needs (0.69 mgd), but not for cooling purposes (4.7 mgd). The City would be very concerned about the impacts from new wells for such a project because the groundwater resources may be inadequate to supply the needed amount of water.

The nearest service line to sites Alt-5 or Alt-6 is located at I-580 and Patterson Pass Road, approximately two miles from the sites.

For the County to provide the water would most likely require new wells because the existing infrastructure is insufficient for the amount required.

The State Water Resources Control Board's Policy 75-58 states in part that "fresh inland waters should only be used for power plant cooling if other sources or methods of cooling would be environmentally undesirable or economically unsound." This policy states that power plant cooling water should, in order of priority, come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. The proposed project would use recycled water that would otherwise be discharged to the ocean, obtained from the SBWR Program, and is consistent with the SWRCB policy. Use of fresh inland water for a power plant at sites Alt-5 or Alt-6 would not be consistent with this policy. Use of dry cooling would be consistent with the policy, but the benefits associated with the use of recycled water would not be realized.

Dry Cooling and Wet/Dry Cooling

Dry cooling systems are a technically feasible alternative to wet cooling. These systems use less water and eliminate the occurrence of visible vapor plumes. However, these systems are less efficient in rejecting heat, and generally require more electricity and create higher pressure in the steam turbine condenser. These factors decrease the thermal efficiency and power output of the plant. In addition, capital costs of dry cooling systems are two to four times as much as wet cooling systems.

Dry cooling could be employed at any of the sites under consideration assuming that space is available. If evaporation ponds are used for wastewater, the space required would increase. For sites Alt-5 and Alt-6, dry cooling could be considered a preferred alternative to using groundwater or potable water and would result in less wastewater to be discharged. However, the benefits associated with the use of reclaimed water would not be realized, the facilities would be less efficient, capital costs would be higher, and air emissions would be higher (as a result of having to use more fuel for the same level of electrical output).

Wastewater

Wastewater in this region is normally handled by the City of Tracy, but currently there is little capacity available to accommodate the 0.6 mgd of wastewater expected (Bayley 2000a, Guzman 2000). The City's wastewater treatment facility has a capacity to treat 9 mgd. The facility treated more than 7 mgd last year, and has treated its capacity in the past. Pipelines near sites Alt-5 and Alt-6 have no available capacity and thus new conveyance infrastructure would be required. If the project is likely to concentrate salts that may increase the salinity of the City's effluent, the wastewater could not be accepted (Bayley 2000a). Therefore, wastewater generated from the project would likely have to be discharged to evaporation ponds or may require a zero discharge system. A zero discharge system is proposed for two other power plant projects under consideration by the Energy Commission.

Stormwater Discharge

At any alternative site an erosion and sediment control plan would be needed to mitigate any potential for impacts due to erosion. In addition, a project of this nature

would have to comply with national Pollution Discharge Elimination System permit requirements, developing and implementing a Storm Water Pollution Prevention Plan for both construction and operation activities. Consequently, the erosion and stormwater related impacts would be essentially the same for each of the alternative sites as for the proposed project.

CONCLUSIONS

Use of sites Alt-1 or Alt-2 would be very similar to the proposed project in regard to water needs, available water supplies, and wastewater discharge impacts. Therefore, use of either of these sites would not avoid, reduce, or mitigate any of the water-related issues or impacts of the proposed project, nor would it create any additional impacts. Therefore, sites Alt-1 and Alt-2 are equivalent to the proposed project in regard to water resources.

A power plant at site Alt-3 or Alt-4 could use recycled water from two sources. One source is the same as that proposed for the MEC project: the San Jose/Santa Clara WPCP. Use of that source would cause the same level of impact as the proposed project to discharge salinity. Use of the other source, the USD Alvarado WWTP, for site Alt 3 or Alt-4 would have similar impacts. Discharging plant wastewater to the USD Alvarado WWTP may avoid the proposed project's potential significant adverse TDS impact at the San Jose/Santa Clara WPCP regardless of the recycle water product source. Therefore, sites Alt-3 and Alt-4 are preferable to the proposed project in regard to water resources.

Several water-related constraints not associated with the proposed project are associated with sites Alt-5 and Alt-6, including the lack of sufficient available water supplies and treatment capacity for wastewater discharge. If the project were modified to employ dry cooling, which is a technically feasible option, these constraints may be lessened. However, water-related impacts may still result from providing the remaining potable water needs and handling the wastewater discharge for either of these sites. In addition, the benefits associated with the proposed project's use of recycled water (and thus a reduction of the amount of effluent being discharged by SBWR to the South Bay) would not occur. To address wastewater discharge concerns, sites Alt-5 and Alt-6, because of their large size, could accommodate a zero discharge wastewater system, unlike the proposed site. This could avoid any impacts associated with evaporation ponds or the lack of wastewater treatment capacity at these sites as well as the potentially significant impact of increased TDS levels at the San Jose/Santa Clara Waste Water Treatment Plant. Sites Alt-5 and Alt-6 may provide an environmentally preferred alternative to the proposed project in regard to water resources if the proposed plant was altered to employ alternative technologies (dry cooling or zero discharge). However, these technologies have the disadvantages of decreased efficiency, increased capital costs, additional land requirements, and increased air emissions.

Several water-related constraints not associated with the proposed project are associated with sites Alt-5 and Alt-6, including the lack of sufficient available water supplies and treatment capacity for wastewater discharge. If the project were modified to employ dry or wet/dry cooling and alternative wastewater disposal

methods, which are technically feasible, these constraints may be lessened. Use of these alternative cooling and disposal methods raises their own issues. In addition, the benefits associated with the proposed project's use of recycled water (and thus the reduction of the amount of effluent being discharged by SBWR to the South Bay) would not occur.

TRAFFIC AND TRANSPORTATION

ANALYSIS

Alt-1 and Alt-2

Sites Alt-1 and Alt-2, located adjacent to Milpitas (north of Highway 237 and east of Zanker Road), would utilize the same access. The sites are surrounded by agricultural land and by agricultural facilities and buildings that house residents engaged in agricultural work. The main traffic concern for these alternatives is site access. Access to either site would be provided via a private road leading to the site off of Zanker Road.

The major traffic impact associated with site Alt-1 or Alt-2 would be the potential delays caused on Zanker Road, which is a two-lane roadway with modest amounts of traffic. A left-turn pocket and the associated road widening on Zanker Road would be needed. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project. Unlike the project, the need for railroad crossings equipment (gates and signals) is not relevant for these two sites because no crossings exist in their vicinity.

Alt-3

Site Alt-3, located in Fremont adjacent to Boyce Road between Stevenson Boulevard and Stewart Avenue, would result in little or no traffic impacts. This site is situated on a vacant portion of the Borden Chemical facility on Boyce Road and is surrounded by industrial uses. Boyce Road is a 4-lane roadway with northbound and southbound left-turn pockets between Stevenson Boulevard and Stewart Avenue serving the existing industrial land uses. An unused left-turn pocket exists on Boyce Road directly adjacent to the proposed alternative site. Boyce Road carries substantial traffic volume as well as modest bike travel (the roadway has a bike lane).

Site Alt-3 has similar traffic characteristics to the proposed project, with the exception of a controlled railroad crossing. Since a left-turn pocket into the proposed site from Boyce Road already exists, no site access problems are expected. A railroad crossing with adequate site distance, active gates, and signals exists on Boyce Road near the southern border of Alt-3. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project.

Alt-4

Site Alt-4, located in Fremont adjacent to Grimmer Boulevard between Fremont Boulevard and Old Warm Springs Road, would cause minor traffic impacts. This site is located on a flat and vacant parcel and is surrounded by a combination of industrial and commercial uses.

Access to the site could be provided via Grimmer Boulevard or Old Warm Springs Road to avoid the greater impact that would result by providing access via Fremont Boulevard, which has higher traffic volumes. Grimmer Boulevard is a four-lane roadway with bike lanes separated by a raised median between Fremont Boulevard and Old Warm Springs Road. An eastbound left-turn pocket serves Kato Road and a westbound left-turn pocket serves the existing commercial land uses adjacent to the proposed alternative site. Grimmer Boulevard carries a substantial amount of vehicle traffic. Old Warm Springs Road is a 30-foot two-lane roadway adjacent the site with no shoulders. Old Warm Springs Road carries much less traffic than Grimmer Boulevard. The intersection of Grimmer Boulevard and Old Warm Springs Road is all-way stop-controlled with crosswalks on all approaches. Delays on either Grimmer Boulevard or Old Warm Springs Road would result with site Alt-4 depending on where the site access is provided.

Site access would need to be provided via Old Warm Springs Road since this option would exhibit the least traffic impact for site Alt-4. A left-turn pocket and the associated road widening necessary for this improvement would be needed on Old Warm Springs Road north of Grimmer Boulevard to reduce any delays that may result from use of the site. The need for railroad crossings equipment (gates and signals) is not relevant at this location since no crossings exist in the vicinity of this alternative site. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project.

Alt-5 and Alt-6

Sites Alt-5 and Alt-6, located adjacent to Midway Road near the eastern border of Alameda County, have little if any traffic concerns. Midway Road is a two-lane roadway with little or no shoulder width, carrying relatively low traffic volumes. These sites are surrounded by PG&E's Tesla Substation to the south and grazing land to the north, east and west.

The provision for a left-turn pocket into Sites Alt-5 or Alt-6 from Midway Road would probably not be needed because the existing traffic volumes on this roadway are relatively low. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project.

CONCLUSIONS

Sites Alt-1 and Alt-2 would differ from the proposed project in that a left-turn pocket would be needed to provide access but there would be no need to install railroad crossing equipment (which the proposed project would require), because there is no railroad nearby.

Site Alt-3 would differ from the proposed project in that railroad crossing equipment would not be needed, because there is no railroad nearby

Site Alt-4 would differ from the proposed project in that railroad crossing equipment would not be needed, because there is no railroad nearby; however, a left-turn pocket may be needed depending upon the choice of access location.

Sites Alt-5 and Alt-6 would differ from the proposed project in that railroad crossing equipment would not be needed because there is no railroad nearby.

Neither the proposed project or any of the six alternative sites would generate any significant environmental impacts; therefore, they are not substantially different with respect to transportation.

VISUAL RESOURCES

ANALYSIS

The proposed project

The **VISUAL RESOURCES** section of the PSA concludes that the proposed project would cause significant unmitigable visual impacts from several view areas.

Alt-1

Site Alt-1 is currently open agricultural land. The landscape in the site vicinity includes other open agricultural land to the east and west, greenhouses and farm worker housing to the south, and the large San Jose/Santa Clara Waste Water Treatment Plant to the north and northwest. State Route 237 is slightly farther to the south and Zanker Road is slightly farther to the west. Use of the site for a power plant is contingent on construction of PG&E's proposed Los Esteros Substation (immediately to the south of Site Alt-1) and related transmission lines. The environmental setting for a project at Site Alt-1 would thus have substantial heavy industrial components and visual quality would be low (see PG&E 1998, Figure 16-14). The number of nearby residences is low, and some of them would be removed to construct the substation. The substation would block the view of the site from most other nearby residences. Other residences in the vicinity, including in the trailer park approximately ¾ mile to the southwest across State Route 237, are beyond foreground viewing distances. Travelers on State Route 237 are primarily work-related and the site is not in their primary field of view. The site is more visible from Zanker Road but most travelers on this road are also work related. Considering all of these factors, staff does not expect that use of Site Alt-1 would cause significant visual impacts.

Alt-2

Site Alt-2 is currently used for greenhouses and agricultural worker housing. The landscape in the site vicinity includes open agricultural land to the east and west, greenhouses and farm worker housing to the north, and the large San Jose/Santa Clara Waste Water Treatment Plant farther to the north and northwest. State Route 237 runs close to the south side of the site and Zanker Road is to the west of the site. Use of the site for a power plant is contingent on construction of PG&E's proposed Los Esteros Substation (immediately to the north of Site Alt-2) and related transmission lines. The environmental setting for a project at Site Alt-2 would thus have substantial heavy industrial components and visual quality would be low (see PG&E 1998, Figure 16-14). The number of nearby residences is low, and some of them would be removed to construct the substation and on Site Alt-2. Other residences in the vicinity, including in the trailer park approximately ½ mile to the southwest across State Route 237, are beyond foreground viewing distances. Travelers on State Route 237 are primarily work-related. The site is in their primary field of view. The site is also visible from Zanker Road but most travelers on this road are also work related. Considering all of these factors, staff does not expect that use of Site Alt-2 would cause significant visual impacts.

Alt-3

Site Alt-3 is located in the City of Fremont in an area designated and zoned for general industrial use, including heavy industry. A portion of the parcel on which the site is located is occupied by the Borden Chemical Plant. A large Celotex manufacturing plant is immediately northwest of the site. Warehouses are to the northeast. Two 115 kV electric transmission lines and a rail spur are immediately southeast of the site. Other industrial facilities are beyond the rail spur and Stewart Road to the southeast and to the southwest across Boyce Road. The nearest residences are to the northwest beyond the Celotex plant. The visual quality of the immediate vicinity is low due to the presence of the heavy industrial facilities of the Borden Chemical Plant and the Celotex manufacturing plant. Electrical transmission connection would be to PG&E's Newark Substation, approximately one mile to the south. Land uses along this route are all industrial. Considering these factors, staff does not expect that use of Site Alt-3 would cause significant visual impacts.

Alt-4

Site Alt-4 is located in the City of Fremont in an area designated and zoned for general industrial use, including heavy industry. Surrounding land uses are industrial and commercial, including a lumberyard, a truck trailer and railcar storage yard, and a large RV storage yard. A huge GM/Toyota car manufacturing plant is approximately 0.5 mile to the south. Two residences are located east and southeast of Site Alt-4, the closest of which is about 325 feet from the east property line of the site and across Old Warm Springs Road. No other residences are near the site, and existing development blocks most views of the site from farther away. The site is bounded by Fremont Boulevard to the northwest, Old Warm Springs Road to the northeast, and Grimmer Road to the south. These streets are used primarily for commuter and delivery traffic. The visual quality of the immediate

vicinity is low due to the presence of numerous industrial facilities. Electrical transmission connection would be to PG&E's Newark Substation, approximately two mile to the northwest. One possible route would be overhead for approximately three miles, first along a corridor that contains an existing 115 kV transmission line then along another corridor that contains two 230 kV transmission lines and one 115 kV transmission line. Although the second portion of this route is adjacent to existing residences, because of the existing transmission lines staff does not expect that visual impacts would be significant. A second possible route would be underground for approximately two miles in city streets. Such an underground line would not cause any significant visual impacts. Considering the numerous industrial elements in the project vicinity and the very small number of residences with close views of the site, staff does not expect that use of Site Alt-4 would cause significant visual impacts.

Alt 5 and Alt-6

Sites Alt-5 and Alt-6 are located in rural eastern Alameda County, adjacent to PG&E's Tesla Substation. The site vicinity is primarily grazing land, with wind energy development to the west, including the western portion of Site Alt-6. The visual quality of the vicinity has been degraded by the existing substation, numerous transmission lines crisscrossing the area, and wind development. A transmission line from the site to the substation or to existing transmission lines would be less than 1,000 feet long. The sites are surrounded by hills, blocking views from beyond the hills. No residences are in this immediate area. The closest residences are approximately ¾ mile to the north, and their views toward the sites are blocked by the hills. Travelers on Midway Road and Patterson Pass Road have views of the sites, but traffic is relatively light on these roads and most travelers are commuters. Considering all of these factors, staff does not expect that use of Sites Alt-5 or Alt-6 would cause significant visual impacts.

CONCLUSIONS

Staff does not expect that use of any of the six alternative sites would cause significant visual impacts. Therefore, use of any of the sites would avoid the significant unmitigable visual impacts of the proposed project.

WASTE MANAGEMENT

ANALYSIS

This analysis discusses the implications of locating the proposed Metcalf Energy Center at various alternative sites with respect to waste management. Wastes would be generated during facility construction and operation.

Construction

Wastes generated during project construction include those related to site preparation as well as construction of the facility. As long as the design of the project does not change significantly, the types and quantities of wastes generated from construction of the actual facility would not vary among sites.

Wastes generated during site preparation could vary, according to the quantity and type of contaminants that might exist at the alternative sites, the need to remove existing structures, and contamination which could exist along the length of linear facilities. Potential sources of site-specific contamination could include existing on-site landfills, unauthorized dumping, spills from hazardous materials containers being transported over or temporarily parked at the site, and migration of chemicals from nearby leaking tanks or waste sites. For instance, leaking storage tanks may be found near a site, and contaminants may migrate onto the site itself. Even though a site may appear to be vacant with no evidence of contamination, only a detailed investigation can confirm the nature and extent of contamination.

The potential for contamination along linear routes associated with each alternative is unknown without a site-specific assessment. However, the existence of contamination does not usually imply that there would be a significant impact during linear facility construction, since it would be cleaned up, either before or during construction.

If existing structures have to be removed or modified, additional solid or hazardous waste could also be generated.

Alt-1

Site Alt-1 is currently in agricultural use and does not contain any structures that would have to be removed. Because of the agricultural use, there is the potential for pesticide contamination, but this is speculative, and would have to be investigated as part of an Environmental Site Assessment, as would the potential for other types of contamination.

Alt-2

Site Alt-2 is occupied by greenhouses, agricultural facilities, and worker housing. Demolition of these structures would result in solid wastes that would be taken primarily to nonhazardous landfills. However, it is unlikely that such impacts would be significant, due to the availability of regional landfills. Due to agricultural activity at this site, there is the potential for contamination from pesticides.

Alt-3

Site Alt-3 is located on a vacant portion of a parcel near the Borden chemical facility, and contains an evaporation pond on part of it. Staff has no information regarding the use of the pond. Depending on historical practices, there may be significant groundwater contamination from pond leachate, and remediation may be required. Further information and groundwater sampling would be required to more accurately assess the potential for contamination at the site.

Alt-4

Site Alt-4 is a flat, vacant site located in a general industrial area. A car manufacturing plant is about one-half mile to the south of the site. Since this site is in an industrial area, there may be a higher potential for groundwater or soil

contamination from past activities onsite, or from migration of toxic substances from nearby sites with leaking tanks.

Alt-5 and Alt-6

Both sites are located in agricultural areas, and are currently used for grazing, as are surrounding lands. Thus, there may be a lower potential for toxic substance contamination than for sites Alt-3 and Alt-4, except for the possibility of pesticides.

Operation

The amounts and types of most wastes generated during routine facility operation, such as used oil, solvents, batteries, air pollution control catalyst, and the like, are a function of facility design, and not location. However, wastes generated from treating water used in plant operations could vary, depending on the quality of the source water. Types and amounts of normally occurring constituents can vary greatly in ground and surface water supplies, and the use of reclaimed water may require special treatment options. In addition, site specific considerations may lead to differences in wastewater disposal options, such as zero discharge or the use of evaporation ponds, which in turn may influence the quantity and types of wastes generated from water treatment and use. However, site specific differences in water supply and quality may not lead to significant differences in waste management impacts, because these are usually either minor or can be mitigated successfully.

CONCLUSIONS

Staff has concluded in the **WASTE MANAGEMENT** section of the PSA that the proposed project would not be likely to cause any significant adverse impacts from waste management.

Staff has no site-specific information concerning contamination that may be associated with leaking underground tanks, landfills, past releases of hazardous materials, contaminated wells, etc. at the six alternative sites. Thus, until a site is investigated specifically, the amount of hazardous or nonhazardous waste that may be generated during site preparation is speculative. Sites Alt-1, 2, 5, and 6 are located in agricultural areas, as is the proposed site, so all of these sites may in general have a similar potential for soil contamination, lower than sites Alt-3 and 4, which are located in industrial areas. There is an existing evaporation pond on a portion of site Alt-3, which may also indicate a higher probability of having to manage contaminated soil or groundwater. Except in those instances where there is extensive site contamination resulting from decades of industrial use, management of hazardous wastes from site cleanup activities can be accomplished without significant adverse environmental impacts.

The quantity and types of project wastes due to project operation could differ between the alternative sites, and between the alternative sites and the proposed site. However the likelihood is that any differences would be minor.

COMPARISON OF STAFF ALTERNATIVE SITES AND THE PROPOSED SITE

ALTERNATIVES Table 1 shows staff's assessment of the expected environmental impacts of the proposed project and of use of staff's alternative sites. The following discussion compares use of each of staff's sites to the proposed project in regard to impacts.

ALT-1 AND ALT-2

The proposed project and use of site Alt-1 or Alt-2 are essentially the same in regard to impacts to air quality, geological and paleontological resources, noise, public health, socioeconomics, soil and water resources, and traffic and transportation. The proposed project has less potential for significant impacts to cultural resources than use of site Alt-1 or Alt-2, but impacts due to any of these three options are likely to be mitigable to a less than significant level. Overall, use of site Alt-1 or Alt-2 is environmentally preferable to the proposed project because:

1. It would avoid a significant biological impact of the proposed project for which mitigation is unresolved;

2. It would avoid significant unmitigable land use impacts of the proposed project in regard to inconsistency with detailed design standards of local plans; and incompatibility with nearby land uses; and

3. It would avoid the significant unmitigable visual impacts of the proposed project.

ALT-3

The proposed project and use of site Alt-3 are essentially the same in regard to impacts to air quality, noise, public health, socioeconomics, and traffic and transportation. The proposed project has less potential for significant impacts to cultural resources than use of site Alt-4, but impacts due to either option are likely to be mitigable to a less than significant level. Overall, use of site Alt-3 is environmentally preferable to the proposed project because:

1. It has less potential for flooding than the proposed project;

2. It would avoid a significant biological impact of the proposed project for which mitigation is unresolved;

3. It would avoid significant unmitigable land use impacts of the proposed project in regard to inconsistency with detailed design guidelines of local plans, and incompatibility with nearby land uses;

4. It may avoid a potential significant water resources impact of the proposed project in regard to TDS, depending on the source of the water and where it is discharged; and

5. It would avoid the significant unmitigable visual impacts of the proposed project.

ALT-4

The proposed project and use of site Alt-4 are essentially the same in regard to impacts to air quality, noise, public health, socioeconomics, and traffic and transportation. The proposed project has less potential for significant impacts to cultural resources than use of site Alt-4, but impacts due to either option are likely to be mitigable to a less than significant level. Overall, use of site Alt-3 is environmentally preferable to the proposed project because:

1. It would avoid the potential significant flooding impact of the proposed project;

2. It would avoid a significant biological impact of the proposed project for which mitigation is unresolved;

3. It would avoid significant land use impacts of the proposed project in regard to:

   a. inconsistency with the General Plan;

   b. inconsistency with zoning;

   c. inconsistency with detailed design standards of local plans;

   d. unmitigable impacts on prime farmland;

   e. unmitigable incompatibility with nearby land uses;

4. It may avoid a potential significant water resources impact of the proposed project in regard to salinity, depending on the source of the water and where it is discharged; and

5. It would avoid the significant unmitigable visual impacts of the proposed project.

ALT-5 AND ALT-6

The proposed project and use of site Alt-5 or Alt-6 are essentially the same in regard to impacts to air quality, geological and paleontological resources, public health, socioeconomics, and traffic and transportation. In regard to biological resources, the proposed project would cause significant impacts for which mitigation is unresolved, and use of site Alt-5 or Alt-6 may cause some significant but mitigable impacts and may cause another significant impact that may not be mitigable. Therefore, staff considers the proposed site and the use of site Alt-5 or Alt-6 approximately equal in regard to biological resources.

Use of the proposed site is preferable to the use of site Alt-5 or Alt-6 in the following respects:

1. It has less potential to cause significant water supply impacts, and it would be consistent with state policy regarding avoidance of use of fresh inland water. (These impacts may be mitigable at site Alt-5 or Alt-6 if the project is modified to use dry cooling, although impacts to the potable water supply may remain, costs would be

higher, and efficiency would be lower. Air emissions would also be greater due to the need for more fuel to generate the same electrical output, but this effect could be mitigated. A previous application has been certified by the Energy Commission with dry cooling, with a finding of no significant impacts, so this mitigation appears to be technically, economically, and environmentally feasible).

2. It has less potential to cause significant water discharge impacts. (These impacts may be mitigable at site Alt-5 or Alt-6 if the project is modified to use a zero discharge system with evaporation ponds, although this mitigation would increase costs and the amount of land used for the project. Another application under Energy Commission review proposes a zero discharge system with an evaporation pond, so such mitigation appears to be technically and economically, and environmentally feasible).

3. It would have the benefit of reduced effluent discharge to the South Bay associated with the use of reclaimed water.

Use of site Alt-5 or Alt-6 is preferable to the proposed project in the following respects:

1. It has less potential for significant impacts to cultural resources, although impacts are likely to be mitigable for either the alternative site or the proposed project;

2. It would avoid significant land use impacts of the proposed project in regard to

   a. inconsistency with the General Plan;

   b. inconsistency with zoning;

   c. inconsistency with detailed design standards of local plans;

   d. unmitigable impacts on prime farmland; and

   e. unmitigable incompatibility with nearby land uses; and

3. It would avoid the significant unmitigable visual impacts of the proposed project.

Some significant land use and visual impacts due to the proposed project would be unmitigable, whereas all of the potential significant impacts due to use of site Alt-5 or Alt-6 either may be mitigable or may not occur. Therefore, based on available information, use of site Alt-5 or Alt-6 appears to be environmentally preferable to the proposed project.

SUMMARY

Staff's sites Alt-3 and Alt-4 are the environmentally superior alternatives to the proposed project. Use of staff's alternative sites Alt-1, Alt-2, Alt-3, or Alt-4 is environmentally preferable to the proposed project. Use of staff's alternative sites Alt-5 or Alt-6 appears to be environmentally preferable to the proposed project.

Sites Alt-3 and Alt-4 are approximately equal and are preferable to staff's other alternative sites because staff does not expect the use of either site Alt-3 or Alt-4 to cause any significant environmental impacts.

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GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Steve Munro

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) has 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:

1. 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; and
- 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.

2. 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

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 may need to be publicly noticed unless they are confined to administrative issues and process.

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:

21. 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 audit of project records; and/or

Energy Commission staff inspection 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 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 that the project was approved, unless the 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 Monthly Compliance Reports 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 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 which follows:

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

COMPLAINT LOG NUMBER _____
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

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 which will 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

This 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

This unplanned 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

This unplanned 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

PLANNED CLOSURE

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide 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 or 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 that 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 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

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

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.

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

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

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

EVENT DESCRIPTION	***DATE ASSIGNED***
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……Paul Richins

Introduction..... ……Paul Richins

Project Description ..... ……Paul Richins

Need .....Kerry Willis

Air Quality .....Magdy Badr

Public Health ..... Mike Ringer

Worker Safety and Fire Protection.....Kathi Hann

Transmission Line Safety and Nuisance .....Obed Odoemelam

Hazardous Materials .....Rick Tyler

Waste Management ..... Mike Ringer

Land Use..... Eric Knight

Traffic and Transportation .....Steve Brown

Noise ..... Kisabuli

Visual Resources.....Joe Donaldson

Cultural Resources.....Gary Walker/Dorothy Torres

Socioeconomics .....Jim Adams

Biology.....Linda Spiegel

Water and Soils.....Lorraine White/Joe O'Hagan

Paleontological Resources ..... Robert Anderson

Facility Design..... Steve Baker/Al McCuen/M. Kisabuli

Reliability.....Steve Baker

Efficiency.....Steve Baker

Transmission System Engineering ..... Linda Davis

Alternatives ..... Gary Walker

Compliance Monitoring Plan and General Conditions ..... Steve Munro

Glossary of Terms and Acronyms ..... Bert Fegg

Project Secretary..... Luz Angelica Manriquez

Support Staff……..Nancy Baker