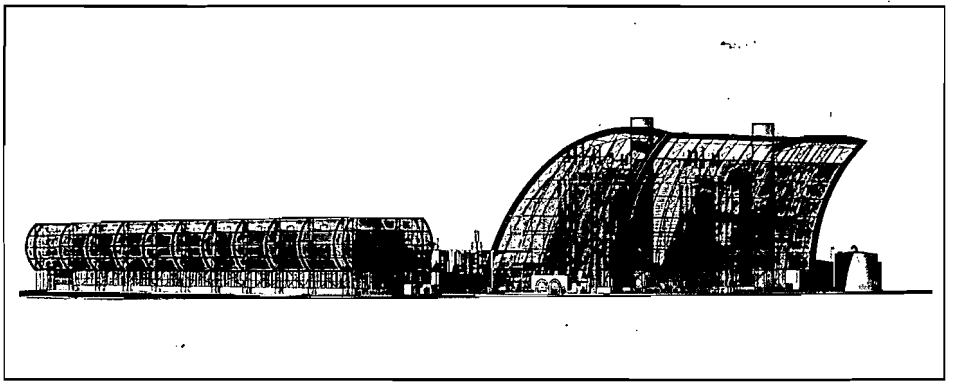
Final Staff Assessment

RUSSELL CITY ENERGY CENTER PROJECT

Application For Certification (01-AFC-7)
Hayward, California



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CALIFORNIA ENERGY COMMISSION

STAFF REPORT

JUNE 2002
(01-AFC-7)

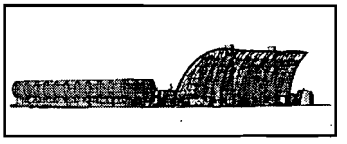
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Gray Davis, Governor

Final Staff Assessment

RUSSELL CITY ENERGY CENTER PROJECT

Application For Certification (01-AFC-7)
Hayward, California



CALIFORNIA ENERGY COMMISSION

STAFF REPORT

JUNE 2002
(01-AFC-7)

Gray Davis, Governor

CALIFORNIA ENERGY COMMISSION

SITING OFFICE

Jack Caswell
Project Manager

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SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION

Terry O'Brien
Deputy Director

EXECUTIVE SUMMARY

Testimony of Jack W. Caswell

INTRODUCTION

This Final Staff Assessment (FSA) contains the California Energy Commission (Energy Commission) staff's evaluation of the Russell City Energy Center (RCEC) Project Application for Certification (AFC) (01-AFC-7). The proposed RCEC electric generating plant is under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification.

Staff is an independent party in the proceedings. This FSA is a staff document, presenting staff's independent analysis. It examines engineering and environmental aspects of the RCEC, based on the information available at the time the FSA is prepared. The FSA contains analyses similar to those contained in Environmental Impact Reports required by the California Environmental Quality Act (CEQA). It is not a Committee document nor is the FSA a final or proposed decision on the proposal. The FSA presents staff's independent assessment, recommendations and proposed conditions of certification that would apply to the design, construction, operation, and closure of the proposed facility, if it is certified.

BACKGROUND

On May 22, 2001, Calpine/Bechtel Joint Development (Calpine/Bechtel) filed an Application for Certification (AFC) for the Russell City Energy Center (RCEC). The AFC was determined to be data adequate for the 6-month process by the Energy Commission at the July 11, 2001 Business Meeting, thus beginning the Energy Commission's review of this project.

The staff, in its Issue Identification Report last summer, supported processing the project as a 6-month project, and the Committee adopted a schedule to implement that process. However, in month six it became increasingly apparent that other agencies that provide critical information for the licensing process would not provide that information in time for the project to be licensed in six months. At the request of the applicant on April 15, 2002, the Committee converted the RCEC project from a 6-month proceeding to a 12-month proceeding. This conversion was granted on April 26, 2002, by Committee order.

The analyses contained in this FSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests, workshops and site visits; 4) supplementary information from federal, state and local agencies; and 5) existing documents and publications.

PROJECT DESCRIPTION

The proposed Russell City Energy Center (RCEC) is a 600 megawatt (MW) natural gas-fired, combined-cycle electric generating facility located at the intersection of Enterprise

and Whitesell Streets in the Industrial Corridor of the City of Hayward in Alameda County, California.

The proposed project consists of two "F-Class" combustion turbine-generators (CTGs), two multi-pressure, supplementary-fired heat recovery steam generators (HRSGs), a single 3-pressure, reheat, condensing steam turbine-generator (STG), and a hybrid, wet/dry plume-abated mechanical draft cooling tower. Additional infrastructure includes: a 230-kilovolt (kV) on-site switchyard, approximately 1.1 mile 230-kV, double circuit overhead transmission line and 7 towers (this line would connect the RCEC switchyard to the existing Pacific Gas & Electric (PG&E) Eastshore substation via PG&E's existing Eastshore to Grant 115-kV transmission corridor); and 0.9 miles of an underground natural gas pipeline that would extend from PG&E's gas distribution line 153 to the RCEC site. The project's water supply will be principally secondary effluent from the City of Hayward's Water Pollution Control Facility (WPCF). This supply will receive tertiary treatment from an Advanced Water Treatment facility to be constructed by the project and owned and operated by the City of Hayward. Backup supplies, domestic and fire protection supplies will be provided by the City of Hayward. Construction of the RCEC is proposed to begin in the summer of year 2003 and continue for 18-21 months. However, the start of construction is now uncertain due to Calpine's new licensing policy of licensing projects and then waiting to start construction when financial and energy markets are favorable.

STAFF'S ASSESSMENT

Each technical area section of the FSA contains a discussion of impacts, and where appropriate, mitigation measures and conditions of certification. The FSA includes staff's assessments of:

- the environmental setting of the proposal;
- environmental impacts, and measures proposed to mitigate these impacts;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation; and
- proposed conditions of certification.

Listed in the table below is a summary of the technical sections showing the most significant potential impact level for that section. For a number of technical areas, staff believes that if the mitigation measures suggested in this document and conditions of certification are implemented, RCEC will be in compliance with the applicable LORS, and no significant adverse direct, indirect, or cumulative impacts will occur. There are

three areas, however, where the potential for significant impacts may exist. For details on the impacts refer to the technical section in this Final Staff Assessment.

Environmental and Engineering Check List	No Impact	Less Than Significant Impact	Less Than Significant Impact With Mitigation	Potentially Significant Impact
ENVIRONMENTAL				
Air Quality			X	
Biological Resources			X	
Cultural Resources			X	
Geology & Paleontology			X	
Hazardous Materials			X	
Land Use	X			
Noise			X	
Public Health		X		
Socioeconomic Resources		X		
Soil & Water Resources			X	
Traffic & Transportation			X	
Transmission Safety Nuisance			X	
Visual Resources			X	
Waste Management			X	
Worker Safety			X	
ENGINEERING , No Check List				
Efficiency	X			
Facility Design			X	
Reliability	X			
Transmission System Engineering			X	

The following provides a discussion of potentially significant impacts and other noteworthy issues. For a more detailed review of potential impacts for all sections see staff's technical section in this FSA.

TECHNICAL AREAS WITH POTENTIALLY SIGNIFICANT IMPACTS

Visual Resources – The visual impacts from the power plant facility itself have been mitigated to a level that is less than significant by the applicant. However, the location of the power plant will result in the relocation of the KFAX radio tower. Because the radio tower relocation is a result of the project, Staff has analyzed the environmental impacts of that relocation, including the visual impacts. Staff has concluded that the visual impact of the radio tower relocation is significant and cannot be mitigated to an impact that is less than significant. This conclusion is based on the proximity of very tall tower structure to the entrance of the Hayward Regional Shoreline Park, and the impact on viewers at or near the park entrance. The tower relocation is proposed for vacant land owned by the City of Hayward, and has already been permitted by the City of Hayward, which has permitting jurisdiction for the tower. The Staff analysis concerning the tower relocation environmental impacts are addressed in the Visual Resources section of this document and Appendix B, ("KFAX Radio Tower Environmental Assessment").

TRANSMISSION SYSTEM IMPACTS

The RCEC project will increase the electrical demand on the existing transmission line system. Staff believes that a likely result of the project is the reconductoring of the East Shore to San Mateo 230 kV transmission line, which would otherwise be subject to excessive load demands from this project when added to the current electrical demands on this system. The applicant has provided an environmental assessment for the reconductoring of the East Shore to San Mateo line. Staff has reviewed the study to verify its assessment of potential impacts to the environment from the reconductoring. The effects of the reconductoring project are discussed in the Transmission System Engineering section of this document and Appendix A ("East Shore to San Mateo Reconductoring CEQA Analysis").

ENVIRONMENTAL JUSTICE

Staff conducted an environmental justice analysis for the proposed Russell City Energy Center based on U.S. Environmental Protection Agency Guidance. Using Census 2000 data, staff determined that a minority population of greater than 50 percent exists within a six-mile radius of the proposed project. Staff uses a six-mile radius as the potential affected area to be consistent with the area evaluated for cumulative air quality impacts. Several technical areas in this FSA include an environmental justice evaluation. Staff did not find a potential significant impact or disproportionate impact on the minority population.

STAFF CONCLUSIONS AND RECOMMENDATION

With the mitigation the applicant has agreed to provide, Staff believes that the project can be built consistent with all applicable laws, ordinances, regulations, and standards. Impacts from the project and the associated transmission facilities have likewise been mitigated, by the agreed upon conditions of certification, to impact levels that are less than significant. Thus, all facilities that would be licensed by the Energy Commission are consistent with all applicable legal requirements, and do not result in significant adverse environmental impacts.

The power plant will provide a new generation source that will contribute to overloading of the East Shore to San Mateo 230 kV line, making the reconductoring of that line a reasonably foreseeable result. The transmission line is owned by PG&E, which must apply to the CPUC for permission to upgrade the line. The Energy Commission will not be the licensing agency for such a project, but it has required that the impacts be generally analyzed so that the Energy Commission will fully understand the potential range of environmental consequences of licensing the power plant. Based on the applicant's environmental assessment, discussions with PG&E, and its own analysis, Staff believes that it is likely that impacts from reconductoring can be mitigated to levels that are less than significant by avoiding sensitive biological resources.

As stated in earlier staff testimony, the KFAX radio tower will be moved as a result of the project to land owned by the City of Hayward, which has granted entitlements for

such a move. The relocated radio tower will, in staff's view, result in a significant adverse visual impact that cannot be feasibly mitigated to a less than significant level.

Staff has concluded in its Transmission System Engineering section that the RCEC project will provide significant voltage support and reliability benefits to the east San Francisco Bay area, and to the San Francisco peninsula assuming the reconductoring discussed above. Based on these important benefits, Staff recommends that the project be licensed, and that the decision include a statement of overriding considerations indicating that the visual impacts of the radio tower are acceptable in light of the benefits the project provides.

RUSSELL CITY ENERGY CENTER
FINAL STAFF ASSESSMENT

EXECUTIVE SUMMARY 1

INTRODUCTION 2

PROJECT DESCRIPTION 3

ENVIRONMENTAL ASSESSMENT 4

- AIR QUALITY 4.1
- BIOLOGICAL RESOURCES 4.2
- CULTURAL RESOURCES 4.3
- HAZARDOUS MATERIALS MANAGEMENT 4.4
- LAND USE 4.5
- NOISE 4.6
- PUBLIC HEALTH 4.7
- SOCIOECONOMIC RESOURCES 4.8
- TRAFFIC AND TRANSPORTATION 4.9
- TRANSMISSION LINE SAFETY AND NUISANCE 4.10
- VISUAL RESOURCES 4.11
- WASTE MANAGEMENT 4.12
- WATER AND SOILS 4.13
- WORKER SAFETY AND FIRE PROTECTION 4.14

ENGINEERING ASSESSMENT 5

- FACILITY DESIGN 5.1
- GEOLOGY AND PALEONTOLOGY 5.2
- POWER PLANT EFFICIENCY 5.3
- POWER PLANT RELIABILITY 5.4
- TRANSMISSION SYSTEM ENGINEERING 5.5

ALTERNATIVES 6

GENERAL CONDITIONS 7

APPENDIX A RECONDUCTORING PROJECT IMPACT ANALYSIS 8

APPENDIX B KFAX RADIO TOWER TRELOCATION REPORT 9

PREPARATION TEAM 10

INTRODUCTION

Jack W. Caswell, Project Manager

PURPOSE OF THIS REPORT

The Final Staff Assessment (FSA) is the California Energy Commission (Energy Commission) staff's independent analysis of the Russell City Energy Center (RCEC) project's Application for Certification (AFC). The FSA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision. The FSA describes the following:

- the existing environment;
- the proposed project;
- 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;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors which may lessen or eliminate potential impacts;
- the proposed conditions under which the project must be constructed, and operated, if it is certified ;
- project alternatives;
- project closure.

The analyses contained in this FSA are based upon information from the: 1) AFC, 2) subsequent amendments, 3) responses to data requests, 4) supplementary information from local and state agencies and interested individuals, 5) existing documents, publications, 6) independent field studies and research 7) comments and information gathered at workshops. 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 not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements. The FSA presents conclusions and proposed conditions that apply to the design, construction, operation and closure of the proposed facility.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code sections 25500 et seq., and Title 20, California Code of Regulation sections1701 et seq., and the California Environmental Quality Act (CEQA).

ORGANIZATION OF THE STAFF ASSESSMENT

This **INTRODUCTION** section explains the purpose of the FSA and its relationship to the Energy Commission's siting process.

The **PROJECT DESCRIPTION** section provides a brief overview of the project including its purpose, location and major project components.

The environmental and engineering evaluations of the proposed project follow the "PROJECT DESCRIPTION". In the environmental analysis, the project's environmental setting is described, environmental impacts are identified and their significance assessed, and the project's compliance with applicable laws is reviewed. The mitigation measures proposed by the applicant are reviewed for adequacy and conformance with applicable laws; if any remaining unmitigated impacts are identified, staff proposes additional mitigation measures and project alternatives. Staff's conclusions and recommendations are discussed, and proposed conditions of certification are included, if applicable. In the engineering analyses, the project is evaluated in each technical area with respect to applicable laws and performance objectives. Staff proposed modifications to the facility, if applicable, are listed. Each technical section ends with a discussion of conclusions and recommendations. Proposed conditions of certification are included, if applicable.

ENVIRONMENTAL JUSTICE

Staff provides a determination of whether any project impacts fall disproportionately on a low-income or minority population. This analysis is provided several of the technical section of the FSA and discusses the potential direct and cumulative impacts of a proposed project. The Public Adviser delivered more than 8,700 flyers for insertion into the Hayward Daily News. Additionally More than 1000 additional flyers and 20 posters were sent to environmental groups and two churches.

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 power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts, and compliance with applicable governmental laws or standards (Pub. Resources Code, section25523 (d), 25552).

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)). Staff's independent review is presented in a report (Cal. Code Regs., tit. 20, section 1742.5).

In addition, staff must assess the completeness and adequacy of the measures proposed by the applicant in terms of applicable 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. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, section 21080.5 and Cal. Code Regs., tit. 14, section 15251 (k)).

In this Final Staff Assessment, staff presents its analysis, conclusions, and recommendations. Where staff believes it is appropriate, the FSA incorporates comments received from city, county, state, and federal agencies, the public and parties to the siting case, and comments made at the workshops. The FSA serves, as staff's written testimony for Evidentiary Hearings.

There will be a comment and review period to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the review period, staff will conduct a workshop to discuss their findings, proposed mitigation, and proposed compliance-monitoring requirements. Based on the workshops and written comments, staff may amend their analysis, correct errors, and finalize conditions of certification to reflect areas where we have reached agreement with the parties.

The staff's assessment is only one piece of evidence that will be considered by the Committee (two commissioners who have been assigned to this project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public hearings, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. During the hearing proceedings the Committee 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 circulated in order to receive written public comments within 30 days. 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 intervenor may request that the Energy Commission reconsider its decision.

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 FSA.

PROJECT DESCRIPTION

Jack W. Caswell, Project Manager

NATURE AND PURPOSE OF THE PROJECT

The Russell City Energy Center (RCEC) project is proposed by Calpine/Bechtel Corporation (referred to as either "Calpine/Bechtel," or the "applicant"). On May 22, 2001, the applicant filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) for a 6-month, expedited review to construct and operate a 600 megawatt (MW) natural gas-fired combined cycle electrical generating facility. On July 11, 2001, the California Energy Commission found the AFC to be data adequate. The finding of data adequacy by the Commission began staff's analysis of the project. On April 15, 2002 the applicant filed a request with the Committee to convert the RCEC project to a 12-month review process, this request was granted by the Committee on April 26, 2002.

The applicant's objectives include selling clean and efficiently generated energy to the California's electricity market; benefiting the electrical supply and transmission system within the San Francisco Bay area; providing system reliability and transmission congestion benefits; and, locating generation near centers of demand for maximum efficiency and system benefits.

PROJECT LOCATION

Calpine/Bechtel proposes to construct and operate an energy generating facility known as the Russell City Energy Center (RCEC) in the City of Hayward's industrial Corridor (Alameda County). The site will consist of 14.7 acres and will accommodate generation facilities, an advanced water treatment facility, control and administration building, emission control equipment, storage tanks, parking area, and storm water detention basins. The proposed facilities will be located in the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility (WPCF). This location is approximately 2 miles from the east entrance to the San Mateo-Hayward Bridge (State Route 92). See **Project Description Figure 1** for the local setting of this proposed project. In addition, primary construction worker parking are proposed to be located adjacent to the Pacific Gas and Electric (PG&E) Co. Eastshore Substation.

In addition, a radio antenna tower at the project site will require relocation to vacant land owned by the City of Hayward near the entrance to the Hayward Regional Shoreline Park. The impacts of the radio tower relocation have been discussed separately in the Visual Resources section of the AFC as Appendix B.

PROJECT FACILITIES

The proposed facility will include two Siemens Westinghouse "F-class" combustion turbine generators (CTGs) equipped with dry, low oxides of nitrogen (NOx) combustors and steam injection capability; two heat recovery steam generators (HRSG); a single

condensing steam turbine-generator (STG); a dearerating surface condenser; a mechanical draft hybrid, (wet/dry) plume-abated cooling tower; and, support equipment. Each HRSG unit will have a 145 foot exhaust stack and will be equipped with duct burners for additional steam production when increased electric power generation is necessary. See **Project Description Figure 2** for the facility and equipment configuration of the proposed project. Also see the **Visual Resources** section for discussion and figure of the plant design.

To control emissions of air pollutants, RCEC will have gas turbines with dry, low nitrogen oxide (NOx) burners. The units will use the best available control technology (BACT) including selective catalytic reduction (SCR) for control of NOx. The SCR system consists of a reduction catalyst and an aqueous ammonia injection system. In addition, the RCEC is required by the Bay Area Air Quality Management District to provide emission reduction credits for NOx and precursor organic compounds (POC).

NATURAL GAS FACILITIES AND TRANSMISSION LINE

Natural gas will be supplied from a 0.9 mile pipeline that will be constructed to deliver fuel from pipeline number 153 located along the Union Pacific Railroad corridor. The pressure of natural gas delivered to the site is expected to be approximately 250 pounds per square inch gauge (psig).

The RCEC will interconnect with the electrical grid from a switchyard built on the plant site, which connects to PG&E's Eastshore Substation south of State Route 92. The proposed transmission line is a 1.1 mile 230-kilovolt (kV) double-circuit overhead line which will be added to the existing corridor of the Eastshore-Grant 115 kV transmission line and run parallel to that line. The project will be responsible for the construction of seven additional transmission towers to accommodate the project's transmission line.

Reconductoring may be required prior to plant operation. RCEC has provided an environmental assessment of the East Shore to San Mateo 230 kV transmission line. Staff has reviewed this document and provided comments in the Transmission System Engineering section of the FSA under Appendix A.

WATER SUPPLY AND WASTE WATER TREATMENT

The combined cycle units are proposed to use a maximum of 3.3 million gallons per day (gpd) or 3,730 acre feet of water per year. Approximately 95 percent of the water demand would be used as makeup water for evaporation losses in the cooling tower. The remainder will be used as process water to produce steam and for other plant uses. The cooling and process water used at RCEC will consist of secondary effluent (wastewater) supplied by the City of Hayward's Water Pollution Control Facility (WPCF) located across from the plant site. This water will be delivered from WPCF to a new advanced wastewater treatment plant (AWT) which will supply tertiary effluent water to the plant (secondary effluent is not appropriate for power generating operations without additional treatment). The AWT will be built by the project and ultimately owned and operated by the City of Hayward. Cooling wastewater from the plant will subsequently be delivered to the WPCF for reuse.

Secondary effluent from the City's WPCF will be the primary water supply for RCEC following treatment in the AWT. The AWT will provide for six million gallons of on-site storage of recycled water. In the event of an extended outage at the Hayward WPCF that depletes this storage, the City of Hayward will provide water from the City's (Hetch Hetchy) water supply. Water for fire protection, drinking and other domestic uses will be supplied from this City of Hayward source. Pipelines will be constructed from the WPCF to the AWT and the plant under Enterprise Avenue along with wastewater return piping from the plant to the WPCF.

CONSTRUCTION AND OPERATION

Calpine/Bechtel proposes construction to begin on the project in the spring of year 2003 and take approximately 18 to 21 months. Commercial operation of RCEC is expected to begin by the summer of year 2005. The construction force necessary for RCEC is expected to peak at 485 workers in month 15. Once the new units are on line, the operational staff required is expected to be about 25 employees. The capital cost of the RCEC project is expected to be between $300 and $400 million.

FACILITY CLOSURE

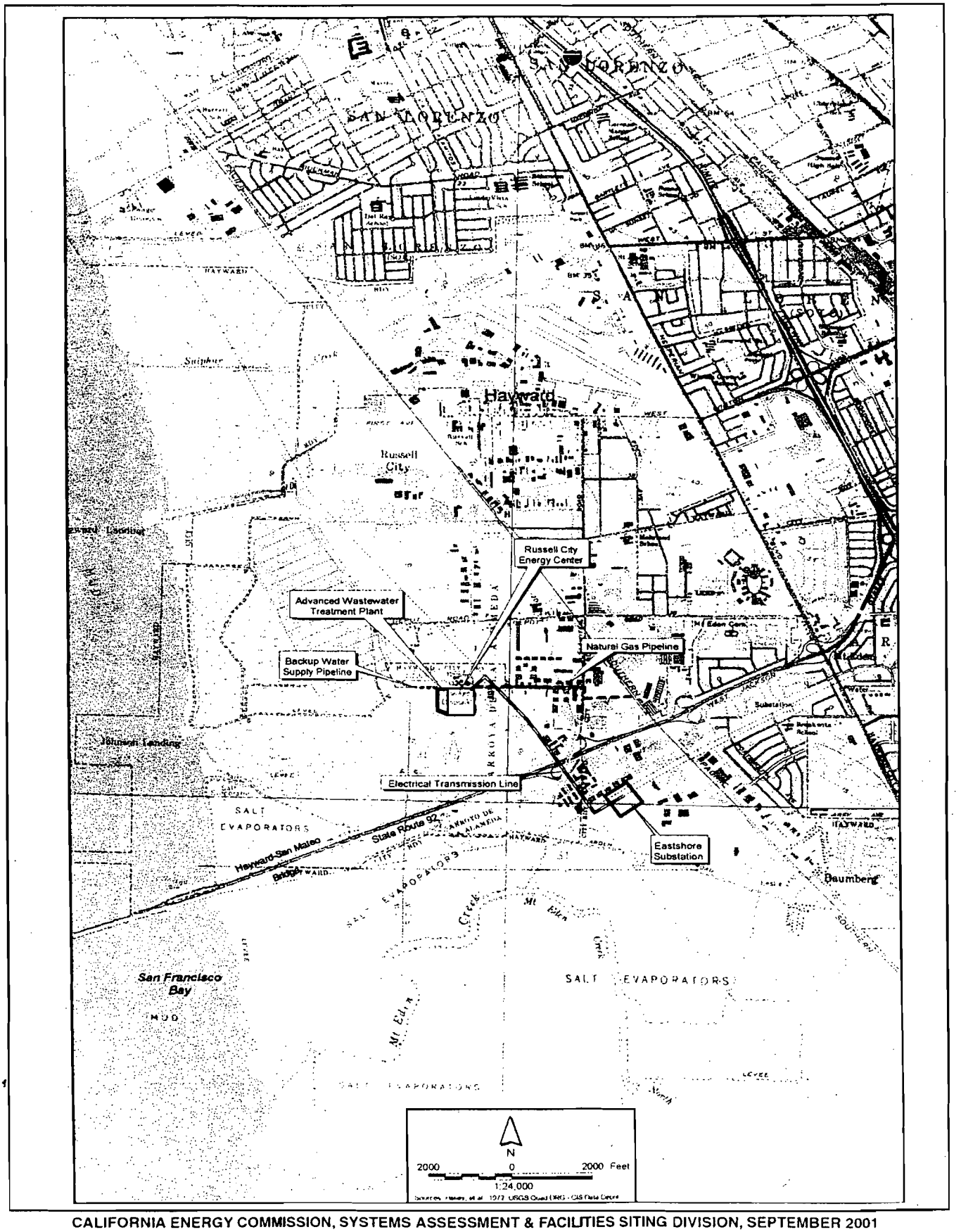
The planned life of the RCEC facility is 30 years or longer. Whenever the facility is closed, either temporally or permanently, the closure procedures will follow the described plan provided in the RCEC AFC, LORS, and in the Staff Assessment discussions on facility closure and Conditions of Certification.

REFERENCES

Calpine/Bechtel, Application for Certification (AFC), Volumes 1 and 2 (Appendices), submitted to the California Energy Commission on May 22, 2001

Calpine Corporation, Revised Mitigation Plans and Additional Information, January 2002, submitted to the California Energy Commission on January 31, 2002

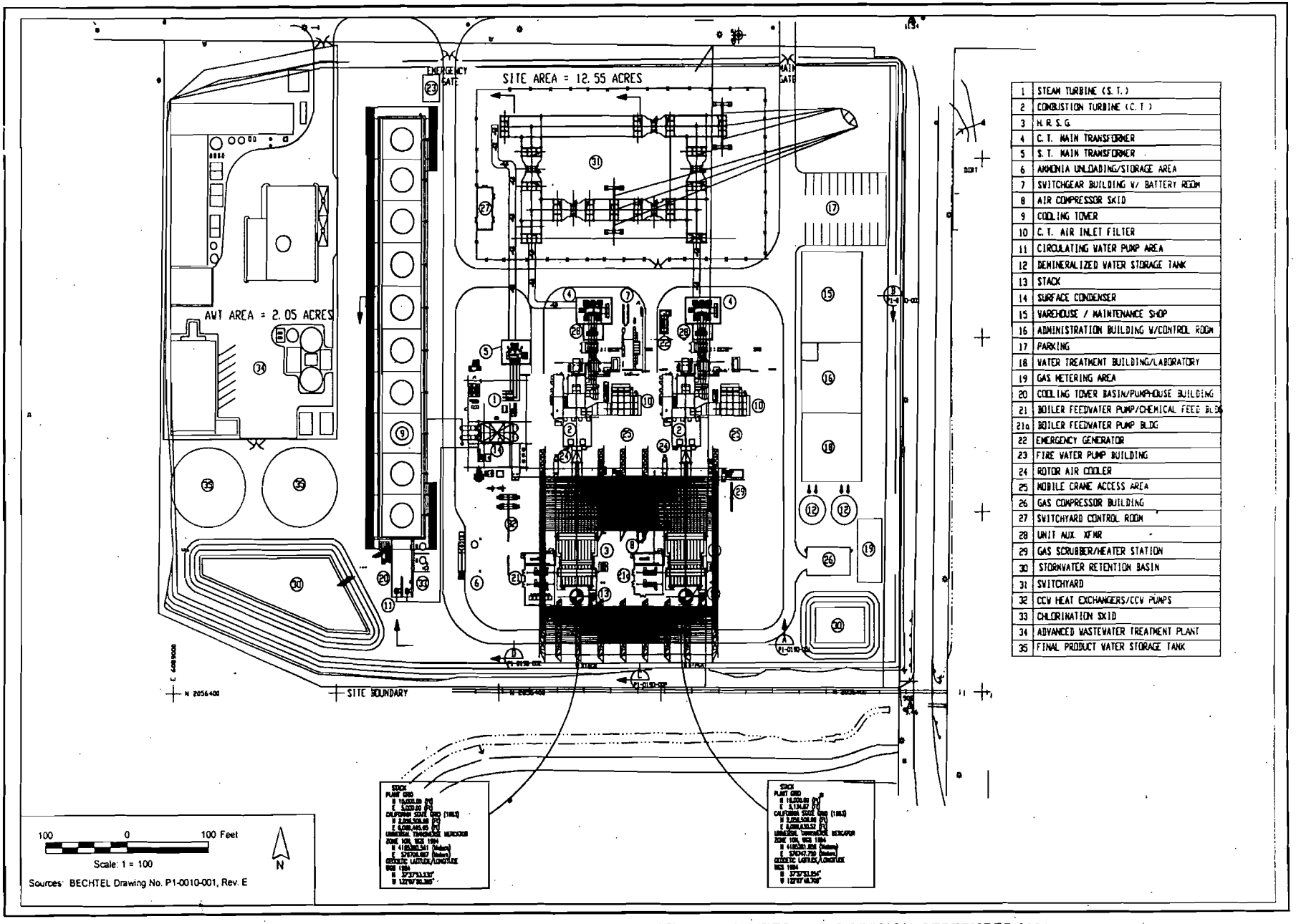
PROJECT DESCRIPTION - FIGURE 1
Russell City Energy Center - Local Setting



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, SEPTEMBER 2001
SOURCE: AFC Figure 1-2

PROJECT DESCRIPTION - FIGURE 2

Russell City Energy Center - Plant Configuration



1	STEAM TURBINE (S.T.)
2	COMBUSTION TURBINE (C.T.)
3	H.R.S.G.
4	C.T. MAIN TRANSFORMER
5	S.T. MAIN TRANSFORMER
6	AMMONIA UNLOADING/STORAGE AREA
7	SWITCHGEAR BUILDING W/ BATTERY ROOM
8	AIR COMPRESSOR SKID
9	COOLING TOWER
10	C.T. AIR INLET FILTER
11	CIRCULATING WATER PUMP AREA
12	DEMINERALIZED WATER STORAGE TANK
13	STACK
14	SURFACE CONDENSER
15	WAREHOUSE / MAINTENANCE SHOP
16	ADMINISTRATION BUILDING W/CONTROL ROOM
17	PARKING
18	WATER TREATMENT BUILDING/LABORATORY
19	GAS METERING AREA
20	COOLING TOWER BASIN/PUMPHOUSE BUILDING
21	BOILER FEEDWATER PUMP/CHEMICAL FEED BLDG
21a	BOILER FEEDWATER PUMP BLDG
22	EMERGENCY GENERATOR
23	FIRE WATER PUMP BUILDING
24	ROTOR AIR COOLER
25	MOBILE CRANE ACCESS AREA
26	GAS COMPRESSOR BUILDING
27	SWITCHYARD CONTROL ROOM
28	UNIT AUX. XFMR
29	GAS SCRUBBER/HEATER STATION
30	STORMWATER RETENTION BASIN
31	SWITCHYARD
32	CCW HEAT EXCHANGERS/CCW PUMPS
33	CHLORINATION SKID
34	ADVANCED WASTEWATER TREATMENT PLANT
35	FINAL PRODUCT WATER STORAGE TANK

PROJECT DESCRIPTION

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, SEPTEMBER 2001

SOURCE: AFC Figure 2.2-1

ENVIRONMENTAL

ASSESSMENT

AIR QUALITY

Testimony of Gabriel D. Behymer

INTRODUCTION

This Final Staff Assessment (FSA) evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed Russell City Energy Center (RCEC). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), precursor organic compounds (POC) and particulate matter less than 10 microns in diameter (PM10).

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

1. Whether the project is likely to conform with applicable Federal, State and Bay Area Air Quality Management District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);
2. Whether the project is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
3. Whether the mitigation proposed for the project is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (42 U.S.C. §7401 et seq.), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the United States Environmental Protection Agency (USEPA) to the Bay Area Air Quality Management District. The USEPA determines conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

STATE

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

LOCAL

The project is subject to all applicable Bay Area Air Quality Management District (District or BAAQMD) rules and regulations, briefly described below:

Regulation 2

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

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

- Section 2-2-301 - Best Available Control Technology (BACT) Requirement: This rule requires that BACT be applied for each pollutant which is emitted in excess of 10.0 pounds per day.
- Section 2-2-302 - Offset Requirement, Precursor Organic Compounds (POC) and Nitrogen Oxides (NOx): This section applies to projects with an emissions increase of 50 tons per year or more of POC and/or NOx. Offsets shall be provided at a ratio of 1.15 tons of emission reduction credits for each 1.0 ton of proposed project permitted emissions.
- Section 2-2-303 - Offset Requirements, Particulate Matter Less Than 10 Microns in Diameter (PM10) and Sulfur Dioxide (SO2): If a Major Facility (a project that emits more than 100 tons per year of PM10) has a *cumulative increase* of 1.0 ton per year of PM10 or SO2, emission offsets must be provided for the entire cumulative increase at a ratio of 1.0:1.0.

Emission reductions of nitrogen oxides and/or sulfur dioxide may be used to offset increased emissions of PM10 at offset ratios deemed appropriate by the Air Pollution Control Officer. A facility that emits less than 100 tons of any pollutant may voluntarily provide emission offsets for all, or any portion, of their PM10 or sulfur dioxide emissions increase at the offset ratio required above (1.0:1.0).

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

Rule 7-Acid Rain. This rule applies the requirements of Title IV of the federal Clean Air Act, which are spelled out in Title 40, Code of Federal Regulations, section 72. The provisions of Section 72 will apply when USEPA approves the District's Title IV program, which has not been approved at this time. The Title IV requirements will

include the installation of continuous emission monitors to monitor acid deposition precursor pollutants.

Regulation 6

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

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

Regulation 9

Rule 1 - Limitations

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

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

Regulation 10

Rule 26 - Gas Turbines - Standards of Performance for New Stationary Sources. This rule adopts the national maximum emission limits (40 C.F.R. §60) which are 75 ppm NOx and 150 ppm SO2 at 15 percent O2. Whenever any source is subject to more than one emission limitation rule, regulation, provision or requirement relating to the control of any air contaminant, the most stringent limitation applies.

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

The climate of the San Bay Francisco area is dominated by a semipermanent high pressure system off the Pacific Coast, known as the Pacific High. During the summer months, the Pacific High extends to and often over the western United States, causing low pressure systems to pass north of the Pacific High into Canada and strong northwesterly air flow around the north-eastern edge of the Pacific. This air flow causes colder water to accumulate close to the California coast, thus cooling the onshore air flow further. The relatively cold air temperatures cause a high incidence of coastal fog and cloud cover along the northern California coast, but the brisk westerly winds blow throughout the afternoon and evening hours usually disperse the fog by late afternoon.

During the winter months, the Pacific High moves south, allowing low pressure systems to move through California. Cloud cover, precipitation, and generally strong winds prevail during this period. About 80 percent of the average annual rainfall (approximately 20 inches) in the area occurs between the months of November and March. Between storms, skies are fair, winds are light, and temperatures are moderate.

Temperatures in the general area of the proposed site are moderated by the proximity of the ocean and the San Francisco Bay. Local ambient temperatures range from the mid-50s to low-90s in the summer, fall and spring, and from the mid-40s to low-60s during the winter.

Specific local meteorological data was collected by the District at their Union City monitoring station located approximately 4.2 miles southeast of the project site. The data sets from 1990 through 1994 were proposed for use by the applicant and approved by the district. These data sets include hourly measurements of ambient temperature, Pasquill air stability class, wind speed and wind direction. Monthly wind roses, which are graphic representations showing wind speeds and directions based on the collected data from all four years, are shown in Appendix A. At the Union City location, the winds blow almost solely from the west-north-west during the spring and summer seasons and with nearly equal frequency from the west-north-west and the south-east during the fall and winter seasons.

Smith et al. (1984) reported that mixing heights in the area, which represent the altitudes to which different air masses mix together, have been estimated to range from a minimum of approximately 80 meters in the morning to a maximum of 2,300 meters in the afternoon. Higher mixing heights, normally associated with unstable conditions, can lead to greater dispersion of air contaminants and lower impacts. When the mixing height is low and the wind is calm, air contaminants can be trapped near the ground and impacts will be higher due to lower dilution.

EXISTING AIR QUALITY

The United States Environmental Protection Agency (EPA) and the California Air Resource Board (CARB) both establish allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more stringent) than the federal AAQS, established by USEPA. The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated, the averaging times for the various air quality standards (the duration over which they are measured) range from one hour to one year (annual). The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (10^{-3} g, 0.001 g or mg) or micrograms (10^{-6} g, 0.000001 g or μg) of pollutant per cubic meter (m^3) of air.

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	1 Hour	0.12 ppm (235 $\mu g/m^3$)	0.09 ppm (180 $\mu g/m^3$)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	-
	1 Hour	-	0.25 ppm (470 $\mu g/m^3$)
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 $\mu g/m^3$)	-
	24 Hour	0.14 ppm (365 $\mu g/m^3$)	0.04 ppm (105 $\mu g/m^3$)
	3 Hour	0.5 ppm (1300 $\mu g/m^3$)	-
	1 Hour	-	0.25 ppm (655 $\mu g/m^3$)
Respirable Particulate Matter (PM10)	Annual Geometric Mean	-	30 $\mu g/m^3$
	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Annual Arithmetic Mean	50 $\mu g/m^3$	-
Sulfates (SO_4)	24 Hour	-	25 $\mu g/m^3$
Lead	30 Day Average	-	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	
Hydrogen Sulfide (H_2S)	1 Hour	-	0.03 ppm (42$\mu g/m^3$)
Vinyl Chloride (chloroethene)	24 Hour	-	0.010 ppm (26 $\mu g/m^3$)
Visibility Reducing Particulates	1 Observation	-	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where

not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

The Russell City Energy Center is located in the city of Hayward within the Bay Area Air Basin and is under the jurisdiction of the Bay Area Air Quality Management District. All state and federal ambient air quality designations are presented in AIR QUALITY Table 2 below (EPA 1999 & CARB 1999). Note that the region is classified as Nonattainment for both the State PM10 and State Ozone Ambient Air Quality Standards. The region is also classified as Nonattainment for the Federal Ozone Ambient Air Quality Standard.

AIR QUALITY Table 2
Local Air Quality Classifications

Pollutant	State Designation	Federal Designation
NO2	Attainment	Attainment
CO	Attainment	Attainment
PM10	Nonattainment	Attainment
SO2	Attainment	Attainment
Ozone	Nonattainment	Nonattainment

Ambient air quality data has been collected extensively in the Bay Area Air Basin. NO2, CO and SO2 are all classified as in attainment with both the State and Federal AAQS. AIR QUALITY Table 3 below shows the maximum ambient concentrations of the three attainment pollutants measured by the BAAQMD over the past decade, and demonstrates that no violation of standards have occurred.

AIR QUALITY Table 3
BAAQMD Attainment Pollutant
Maximum Ambient Concentrations (ppm)

Pollutant	Averaging Time	1993	1994	1995	1996	1997	1998	1999	Limiting AAQS
NO2	Annual	0.027	0.028	0.027	0.025	0.025	0.025	0.026	**0.053**
	1-hour	0.12	0.107	0.116	0.108	0.118	0.098	0.128	**0.25**
CO	8-hour	7.88	8.75	5.84	7	6.11	6.27	6.28	**9**
	1-hour	14	12	10.1	8.8	10.7	8.7	9	**20**
SO2	24-hour	0.0125	0.0123	0.0117	0.0144	0.0141	0.0159	0.0382	**0.04**
	1-hour	0.11	0.074	0.047	0.063	0.099	0.062	0.098	**0.25**
Source: California Air Resources Board									

The following sections discuss the specific ambient air conditions regarding the two nonattainment criteria pollutants, PM10 and Ozone.

Ambient PM10

PM10 can be emitted directly from a combustion process or it can be formed many miles downwind when various precursor pollutants chemically interact in the atmosphere. Gaseous emissions of pollutants such as NOx, SOx and POC from turbines, and ammonia (NH3) from NOx control equipment can, given the right meteorological conditions, form particulate nitrates, sulfates, and organic solids. These pollutants are known as secondary particulates, because they are not directly emitted but rather are formed outside the facility through chemical reactions in the atmosphere.

The District has recorded violations of the state PM10 AAQS in the Bay Area Air Basin in all recent years, though no violations of the federal PM10 AAQS were recorded. AIR QUALITY Table 4 shows the maximum recorded ambient 24-hour average concentrations and the number of ambient violations of the state AAQS each year. It should be noted that ambient PM10 measurements are only taken once every six days. Therefore, the calculated number of daily violations could be as high as six times the measured number of violations indicated.

AIR QUALITY Table 4
BAAQMD PM10 Maximum 24-hour Average Concentrations and Number of Measurement Periods In Violation with the State AAQS

Station	PM10	1993	1994	1995	1996	1997	1998	1999	2000
Marin County Summary	24-Hour High Avg. ($\mu g/m^3$)	69	72.4	74.2	50.3	72	52.4	75.6	39.5
	State Violations	1	4	1	0	2	1	2	0
SF County Summary	24-Hour High Avg. ($\mu g/m^3$)	69	93	49.9	70.9	81	52.4	77.9	63.2
	State Violations	5	6	0	2	3	1	6	2
Alameda County Summary	24-Hour High Avg. ($\mu g/m^3$)	84	96.9	51.7	71.1	64.7	62.7	87.9	71.2
	State Violations	4	4	2	1	2	2	3	2
San Leandro	24-Hour High Avg. ($\mu g/m^3$)	51	61.8	47.1	58.8	64.7	32.4	NA	NA
	State Violations	1	1	0	1	1	0	NA	NA
Fremont	24-Hour High Avg. ($\mu g/m^3$)	77	81.8	51.5	58.8	63.1	62.7	87.9	58.1
	State Violations	3	3	1	1	1	1	2	1
Livermore (Old 1st St.)	24-Hour High Avg. ($\mu g/m^3$)	84	96.9	51.7	71.1	61.6	62.3	86.6	71.2
	State Violations	3	4	1	1	2	2	3	2
Contra Costa County Summary	24-Hour High Avg. ($\mu g/m^3$)	81	87	72.7	75.6	77.8	66.8	100.6	62.0
	State Violations	7	6	4	1	3	2	7	1
Santa Clara County Summary	24-Hour High Avg. ($\mu g/m^3$)	101	92.6	59.7	76.1	95	92	114.4	76.1
	State Violations	9	9	4	2	3	3	7	7
Basin Wide Summary	24-Hour High Avg. ($\mu g/m^3$)	101	96.9	74.2	76.1	95	92	114.4	76.1
	State Violations	11	10	7	3	4	5	12	7

Source: California Air Resources Board

State 24-Hour Ambient Air Quality Standard for PM10: 50 $\mu g/m^3$
Federal 24-Hour Ambient Air Quality Standard for PM10: 150 $\mu g/m^3$
NA = PM10 data is not yet available for these years at these sites.

Ambient Ozone

Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. NOx and POC react with oxygen in the presence of sunlight to form ozone. Collected air quality data indicates that ambient ozone is a regional pollutant and that violations occur primarily during the period of May through October.

In the Bay Area Air Basin, the maximum ambient ozone levels generally increase from west to east since the air coming onshore from the Pacific is generally clean. As air flows over regions of human activity, it accumulates pollutants. As the pollutants warm

up, the chemical reactions that generate ozone accelerate and the ambient ozone levels increase. This atmospheric chemistry takes time to proceed however, so the secondary ozone impact from NOx and POC emissions is generally miles down wind, to the south and east in the Bay Area Air Basin.

This pattern can be seen in the ozone data presented in AIR QUALITY Table 5 below. Note how the highest 1-hour average and particularly the annual number of state AAQS violations increases from north-west to south-east.

AIR QUALITY Table 5
Maximum Concentration of O_3 (Ozone) and Number of Days in which the State Ozone Standard was Violated

Station	Ozone	1993	1994	1995	1996	1997	1998	1999	2000
Marin County Summary	Highest 1-Hour Average (ppm)	0.080	0.089	0.088	0.105	0.106	0.074	0.102	0.071
	State Violations	0	0	0	2	1	0	2	0
SF County Summary	Highest 1-Hour Average (ppm)	0.080	0.055	0.088	0.071	0.068	0.053	0.079	0.058
	State Violations	0	0	0	0	0	0	0	0
Alameda County Summary	Highest 1-Hour Average (ppm)	0.13	0.129	0.155	0.138	0.114	0.146	0.146	0.137
	State Violations	8	7	21	23	6	22	15	5
Oakland	Highest 1-Hour Average (ppm)	0.110	0.064	0.114	0.088	0.079	0.056	0.081	0.072
	State Violations	1	0	1	0	0	0	0	0
San Leandro	Highest 1-Hour Average (ppm)	0.120	0.089	0.150	0.107	0.109	0.111	0.113	0.098
	State Violations	3	0	6	2	3	2	3	1
Fremont	Highest 1-Hour Average (ppm)	0.13	0.12	0.153	0.10	0.109	0.115	0.133	0.102
	State Violations	5	4	10	2	2	7	3	2
Hayward	Highest 1-Hour Average (ppm)	0.09	0.099	0.145	0.106	0.112	0.116	0.123	0.111
	State Violations	0	1	7	2	2	4	4	1
Livermore	Highest 1-Hour Average (ppm)	0.13	0.129	0.155	0.138	0.114	0.146	0.146	0.137
	State Violations	7	5	20	22	3	21	14	5
Contra Costa County Summary	Highest 1-Hour Average (ppm)	0.130	0.121	0.152	0.137	0.108	0.147	0.156	0.138
	State Violations	10	6	12	15	4	16	8	2
Santa Clara County Summary	Highest 1-Hour Average (ppm)	0.130	0.130	0.145	0.129	0.114	0.147	0.125	0.113
	State Violations	14	8	22	24	3	22	12	4
Basin Wide Summary	Highest 1-Hour Average (ppm)	0.130	0.130	0.155	0.138	0.114	0.147	0.156	0.152
	State Violations	19	13	28	34	8	29	20	12

Source: California Air Resources Board

State 1-Hour Ambient Air Quality Standard for Ozone: 0.09 ppm (180 $\mu g/m^3$)
Federal 1-Hour Ambient Air Quality Standard for Ozone: 0.12 ppm (235 $\mu g/m^3$)

CONSTRUCTION

The Russell City Energy Facility will include the following major components:

- Two 200 MW Siemens Westinghouse 501 FD Phase 2 combustion turbine generators (CTGs),
- Two heat recovery steam generators (HRSGs) with duct burners (rated at 200 MMBtu/hr each),
- One 235 MW steam turbine generator (STG), and
- A ten cell mechanical draft hybrid wet/dry cooling tower.

In addition, the project will include the following major ancillary facilities:

- A 1.1 mile 230 kV, double circuit overhead interconnection transmission line,
- A 300 bhp diesel fire pump,
- A 600 kW natural gas emergency generator, and
- An advanced wastewater treatment facility.

Project Site

The power plant itself will take approximately 21 months to construct. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves. Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and is a relatively small source of emissions in comparison to the early construction activities.

The construction of these facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions from construction equipment and vehicles. The projected maximum daily and annual emissions, based on the highest monthly emissions over the approximately 21 month construction period, are shown in AIR QUALITY Table 6. Note that these maximums do not necessarily occur during the same month, for example the maximum fugitive PM10 occurs during month five while the maximum CO emissions occur during month fifteen (RCEC, AFC Appendix E page 8.1E-2).

AIR QUALITY Table 6
Estimated Maximum Construction Emissions

	NOx	POC	CO	PM10	SOx
Maximum Daily Emissions (lb/day)	382.7	82.1	813.5	44.7	11.5
Maximum Annual Emissions (tons/year)	22.95	6.09	63.82	3.10	0.58
Note: Estimate based on an eight hour workday and a five day work week.					

Predictably, the largest percentage of the total construction emissions from AIR QUALITY Table 6 will be emitted during the project site activity, most of it due to earth moving, grading activities and large crane operations.

Transmission Line Interconnection

The construction of the new transmission lines will include clearing and grading, welding, and clean-up.

OPERATION

Equipment Operation

The CTGs will burn only natural gas; there are no provisions for an alternative back-up fuel.

The highest emissions from the turbines occur in transient states when the turbine is either starting up or shutting down. The specific length of each startup event depends on the length of time the turbine has been shutdown and the temperatures and pressures on the steam turbine side of the power generation block (i.e. the longer the turbine has been shutdown, the more it cools off and thus the longer it takes to restart). The usual practice is to define a startup as either a hot start, a warm start or a cold start, with the startup period being defined as the length of time until the gas turbine is fully loaded, that is, producing baseload electrical power. A hot start would occur after a short turbine shutdown and would take approximately one hour to complete. A warm startup would occur after a typical weekend shutdown (approximately 60 to 72 hours) and would take approximately one and one half hours. A cold start would be more rare, occurring only after the turbines have been under extended shutdown (such as an annual maintenance inspection), and takes approximately two hours. Because of the thermal efficiency of the project, it is highly likely that the RCEC will operate extensively, with few extended shutdown periods.

As a conservative estimation, the applicant has requested that the project be analyzed assuming 52 cold starts and 260 hot starts per year. Staff believes that the more likely scenario is that, barring major mechanical malfunction of the equipment itself, cold startups may occur once or twice a year, most likely during the annual maintenance and inspection. Staff expects that the vast majority of startups would be hot or warm starts, thus minimizing startup periods of time and emissions.

The applicant plans to augment the generating capacity with duct firing in the HRSGs. Duct firing is a process where additional natural gas is burned within the steam generator in order to generate additional steam and thus generate additional electrical energy with the steam turbine. This is a common practice and is generally only cost

effective when demand is high and turbine efficiency is low due to high ambient temperatures.

Emission Controls

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO2, PM10 and CO. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur dioxide emissions. However, in comparison to other fuels used in modern thermal power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low.

Like SO2, the emissions of PM10 from natural gas combustion are also very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue and is thus a relatively clean-burning fuel. A fuel sulfur content limit of 0.25 grains per 100 scf will be applied to the project and is assumed for the SO2 emissions calculations.

After combustion, the flue gases pass through the heat recovery steam generator (HRSG) to extract residual energy and a catalyst system to further reduce NOx emissions. The applicant is proposing to use a Selective Catalytic Reduction system and Dry Low NOx (DLN) combustors to reduce NOx emissions.

Project Operating Emissions

The proposed project's criteria air pollutant emissions during short periods of time (approximately one hour or less) are shown in AIR QUALITY Table 7.

AIR QUALITY Table 7
Individual Equipment Maximum Short-Term Emissions
(pounds per hour [lb/hr])

OPERATIONAL PROFILE	NOx	SOx	PM10	POC	CO
1 CTG Cold Startup (3 hour maximum)	80	1.4	9	16	838
1 CTG Hot Startup (1 hour maximum)	80	1.4	9	16	902
1 CTG Steady State, 100% load with duct burner (limited to 1500 hours per year)	21.4	1.5	12	2.8	31.7
1 CTG Steady State, 100% load without duct burner	19.5	1.4	9	2.6	28.8
Cooling Tower	-	-	0.7	-	-
Emergency Generator	1.77	0.004	0.0006	1.42	3.02
Diesel Fire Pump Engine	3.9	0.106	0.13	0.48	2.35
Total Maximum Short-Term Emissions	105.3	3.11	24.8	20.22	936.7

Note: The applicant has committed to not testing the Emergency Generator and the Diesel Fire Water Pump on the same day, thus the total value includes only the higher of the two for each pollutant. The applicant will further be prohibited by condition of certification from testing the two pieces of equipment concurrently.

As this table shows, the NOx, POC and CO emissions from CTGs during startup are significantly higher than during steady state, full load operation. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation. During startup, combustion temperatures and

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

The estimated maximum daily emissions from the project are shown in AIR QUALITY Table 8. For NOx, CO & POC values, the calculations assume both turbines operate continuously after one cold start and one hot start. For PM10 and SO2 the calculations assume 24 hours of 100% load operations with 16 hours of duct firing.

AIR QUALITY Table 8
Project Maximum Daily Emissions
(pounds per day [lb/day])

	NOx	SO2	PM10	POC	CO
Two CTGs with duct burners	1441.80	67.6	510.0	233.20	8019.2
Cooling Tower	-	-	16.4	-	-
Emergency Generator	1.77	0.004	0.0006	1.42	3.02
Diesel Fire Pump Engine	3.9	0.106	0.1275	0.48	2.35
Total Maximum Daily Emissions	1,445.7	67.71	526.7	234.62	8,022.22
Proposed Daily Emissions Limits	1,364	78	456	230	7,882

Note: The applicant has committed to not testing the Emergency Generator and the Diesel Fire Water Pump on the same day, thus the total value includes only the higher of the two for each pollutant. The applicant will further be prohibited by condition of certification from testing the two pieces of equipment concurrently.

Annual emissions for the two CTGs combined are summarized in AIR QUALITY Table 9. The first line of this table represents a scenario of the maximum number of startups and shutdowns of the CTGs per year, with the balance of hours of operation at full load steady state without duct firing. The second line shows the CTGs operating throughout the year at full load (baseload). SO2 and PM10 are produced in proportion to fuel consumption, thus worst case scenarios of year round 100% operation are presented. One hour per week of testing for the emergency generator and 30 minutes per week of testing for the diesel fire pump engine is also included. Not surprisingly, startup emissions make up a considerable portion of the annual emissions liability.

AIR QUALITY Table 9
Project Maximum Annual Emissions
(tons per year [ton/year])

Operational Profile	NOx	SO2	PM10	POC	CO
52 cold starts and 260 hot starts for each CTG. Remainder of year at steady state.	199.0	12.42	83.39	28.67	610.08
Steady state operation, two CTGs, 1 full year	173.79	12.42	83.39	23.09	256.81
Cooling Tower	-	-	3.02	-	-
Emergency Generator (52 hours per year)	0.046	0.0001	<0.0001	0.037	0.0785
Diesel Fire Pump Engine (26 hours per year)	0.101	0.0028	0.0033	0.012	0.0611
Total Maximum Annual Emissions	199.1	12.43	86.42	28.72	610.22
Proposed Emissions Limits	134.6	12.2	86.4	27.8	584.2

Staff performed an independent calculation of all emissions based on the applicant's proposed operational patterns and vendor emissions data for the specified CTG. The numbers developed (and published in the Staff Assessment) for PM10 and POC were slightly higher then the applicant's estimates and were determined to be due to rounding errors. In contrast, staff's calculation for NOx (199.1 tpy) was much larger then the applicant's proposed value (134.6 tpy). In all cases, however, the applicant has indicated that they will accept emissions restrictions based on the lower, more restrictive, estimate. Since this approach will limit the project's emissions to a lower level and is reflected in the impact assessment presented below, staff supports this approach.

Ammonia Emissions

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the Selective Catalytic Reduction (SCR) system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered, from the stacks. These ammonia emissions are known as ammonia slip. Russell City Energy Center has proposed an ammonia slip no greater than 5 ppm, which is the current ammonia slip level required for other power plant licenses in California. On a daily basis, a maximum ammonia slip of 5 ppmv from both turbines combined will yield as much as 31.6 lbs total emitted to the atmosphere. It should also be noted that ammonia slip of 5 ppm usually only occurs after significant degradation of the SCR catalyst, usually five years or more after commencing operations. At that point, the SCR catalysts are removed and replaced with new catalysts. During most of the operational life of the SCR system ammonia slip emissions would be approximately 1 to 2 ppm, corresponding to a mass emissions of 6 to 13 pounds per day.

PROJECT IMPACTS

MODELING APPROACH

While the emissions are the actual mass of pollutants emitted from the project, the impacts are the maximum concentration of pollutants from the project that people may be exposed to. When emissions are expelled at a high temperature and velocity through

a relatively tall stack, the pollutants will be significantly diluted by the time they reach ground level. In contrast, the impacts from a source emitting at ground level (such as a car or lawnmower) can be much higher. The emissions from the proposed project are analyzed through the use of air dispersion models to determine the impacts at ground level. Once the project is built, the emissions of NOx and CO will be continuously monitored (samples commonly are taken every fifteen minutes) while all other pollutant emissions will be monitored through periodic source tests (commonly every calendar quarter) to insure that they are within the emissions limits.

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

CONSTRUCTION IMPACTS

The applicant performed a refined air dispersion modeling analyses of the potential construction impacts at the project site using the same ISCST3 computer model and meteorological data from 1990 through 1994 used to model the project's steady state impacts. The analyses included fugitive dust generated from the construction activity and combustion emissions from the equipment.

The 1 hour NO2 impact was calculated using the Ozone Limiting Method (OLM). The USEPA (Appendix W of 40 CFR Part 51) and CARB recommend the use of OLM as a second level screening analysis for the determination of NO2 impacts. This method basically assumes that the conversion rate of NO to NO2 is determined by the amount of ozone (O3) present in the atmosphere. This assumption is based on the fact that O3 reacts rapidly with NO forming NO2 and molecular oxygen.

The 24 hour impacts were assessed using the emission rates for the month of maximum activity and annual impacts were assessed using the average emissions for the entire construction period. Most of the highest emissions are estimated to occur approximately halfway through the 21 to 24 month construction period. The results of this modeling effort are shown in AIR QUALITY Table 10.

AIR QUALITY Table 10
Maximum Construction Impacts ($\mu g/m^3$)

POLLUTANT	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO2	1 hour	170.36	208.8	379.2	470	81 %
	Annual	27.36	41.5	68.9	100	69 %
SO2	1 hour	82.12	104.8	186.9	655	29 %
	3 hour	50.05	52	102	1,300	8 %
	24 hour	14.18	18.4	32.6	105	31 %
	Annual	2.335	5.3	7.64	80	10 %
PM10	24 hour	89	88	177	50	354 %
	Annual Geo. Mean	18.8	21.9	40.7	30	136 %
CO	1 hour	977	6440	7417	23,000	32 %
	8 hour	506.23	3617	4123.2	10,000	41 %

The applicant's original construction modeling indicated that the project could cause possible ambient air quality impacts on the 1-hour NO2, annual NO2 and annual PM10 state AAQS, in addition to contributing to the existing 24-hour PM10 problem. At staff's request, the applicant remodeled the construction impacts using more realistic worst case assumptions. Staff believes the impacts reported in AIR QUALITY Table 10 above represent a more realistic estimation of the worst case construction impacts than the estimates presented in the PSA. The modeling shows that, under worst case conditions, the construction activities may cause a violation of the State annual PM10 AAQS as well as contributing to the existing short term PM10 problem.

INITIAL COMMISSIONING

New power generation facilities must go through an initial firing and commissioning phase before going fully on line. During this period, emissions may exceed permitted levels due to startups, shutdowns, extended periods of low load operation and periods of time when the low-NOx burners and SCR systems are fine tuned for optimum performance. Two possible scenarios were identified for RCEC. The first will occur prior to SCR system installation, while the turbine combustor is being tuned. During this test phase, NOx emissions will be uncontrolled while the combustor is tuned for optimum performance. The second scenario will occur after the combustor optimization, but prior to the full installation of the SCR. During this test phase, the turbine may be operated at low load for short periods to test various turbine components.

Under both scenarios, the CO emissions were lower then the modeled CO emissions during routine turbine startup, thus the CO modeling was not repeated. The applicant has prepared air dispersion modeling of the probable NOx ground level impact during initial commissioning activities. This modeling indicates that, given certain restrictions, the initial commissioning activities will not cause ground level violations of state or federal standards. The results of this modeling are presented in AIR QUALITY Table 11 below.

AIR QUALITY Table 11
Maximum Initial Commissioning Impacts ($\mu g/m^3$)

POLLUTANT	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO2	1 hour	121.2	206.8	328	470	69.8 %

PROJECT OPERATION IMPACTS

The air quality impacts of project operation under fumigation meteorological conditions, during combustion turbine startup and during steady-state operations, are discussed in the following sections.

Fumigation Impacts

Surface air is usually very stable during the early morning hours before sunrise. During such meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed and diluted. When the sun first rises, the air at ground level is heated resulting in turbulent vertical mixing (both rising and sinking) of air within a few hundred feet of the ground. Emissions from a stack that enters this turbulent layer of air will also be vertically mixed, bringing some of those emissions down to ground level before significant dispersion occurs and possibly causing abnormally high impacts. As the sun continues to heat the ground, this vertical mixing layer becomes thicker and thicker, 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 USEPA approved SCREEN3 model for the calculation of fumigation impacts during both base load (with duct burners) and start up conditions. AIR QUALITY Table 12 shows the highest modeled fumigation impacts in comparison with the 1 hour NO2, CO and SO2 standards. Since fumigation impacts will not typically occur for more than a 1 hour period, only the impacts on the 1 hour standards are shown. The results of the modeling analysis show that fumigation impacts will not violate either the NO2, CO or SO2 1 hour standards.

AIR QUALITY Table 12
CTG Fumigation Modeling
Maximum 1 hour Impacts ($\mu g/m^3$)

POLLUTANT	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO2	34.6	206.8	241.4	470	51 %
SO2	1.73	104.8	106.53	655	61 %
CO	39.87	6440	6479.87	23,000	28 %

Refined Modeling Analysis

The applicant provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during both steady state operation and startup conditions. The worst case (maximum) results of this modeling analysis are shown in AIR QUALITY Table 13.

AIR QUALITY Table 13
RCEC Refined Modeling Maximum Impacts ($\mu g/m^3$)

POLLUTANT	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO2	1 hour *	18.9	206.8	225.7	470	48 %
	1 hour *	169.0	206.8	375.8	470	80 %
	Annual	0.36	41.5	41.86	100	42 %
SO2	1 hour	20.15	104.8	124.95	655	19 %
	3 hour	3.67	52	55.67	1,300	4 %
	24 hour	0.35	18.4	18.75	105	18 %
	Annual	0.02	5.3	5.32	80	7 %
PM10	24 hour	3.78	88	91.78	50	184 %
	Annual Geo. Mean	0.22	21.9	22.12	30	74 %
CO	1 hour	1230.6	6440	7670.6	23,000	33 %
	8 hour	230.1	3617	3847.1	10,000	38 %

* The worst case 1 hour NO2 impacts are dominated by the emissions from the diesel fire pump engine during the weekly 30 minute test. Worst case 1 hour NO2 impact not including the fire pump engine is 18.9 $\mu g/m^3$ while the worst case impact including the diesel fire pump engine is predicted to be 169.0 $\mu g/m^3$.

This table shows that during worst case normal operations the facility will not cause a surface level violation of any ambient air quality standards. In this case, the maximum impacts were dominated by the diesel fire pump engine's weekly testing. Maximum impacts without the diesel fire pump engine, including only the emissions from the two CTG and duct burners, are significantly lower then those listed in AIR QUALITY Table 13 above. However, the projects emissions of PM10 do add to the existing violations of the state PM10 standard, and thus are a significant impact.

Startup circumstances can be troublesome for significant air quality impacts for a number of reasons. First, emissions (particularly NOx and CO) can be high and often uncontrolled because emissions control equipment is not operating at optimum temperature ranges. Second, low volumetric flow rates and exhaust gas temperatures can result in low exhaust plume rise and consequently higher ground level impacts. Conversely, the highest SO2 and PM10 impacts, both short-term and long term, occur during full load steady state operation. Startup impacts on these pollutants are usually less because emissions of SO2 and PM10 are primarily a function of the volume of fuel burned. During startup much less fuel is burned per unit time than at full load, hence the impacts are lower. For these reasons, startup is modeled separately to assure that no violations occur during such an event. AIR QUALITY Table 14 below shows the maximum short term modeled impacts from a startup event.

AIR QUALITY Table 14
CTG Start Up Modeling
Maximum 1 hour Impacts ($\mu g/m^3$)

POLLUTANT	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO2	68.9	206.8	275.7	470	59 %
SO2	2.03	104.8	106.83	655	16 %
CO	841.0	6440	7281	23,000	32 %

The startup protocols of the project dictate that combustion turbines will be started sequentially (i.e. there will be no simultaneous startup of the two turbines) which will minimize air quality impacts. A startup sequence of a turbine will only occur when the other turbine is operating at steady state or the other turbine is not operating at all.

Since the project's impacts do not cause a violation of any NO2, CO or SO2 ambient air quality standards, staff considers the project impacts for those pollutants to be insignificant. However, all project emissions of PM10 would contribute to the existing PM10 problem in the Bay Area, and thus are considered significant.

Secondary Pollutant Impacts

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

There is a known relationship between emissions of NOx and ammonia and the formation of ammonium nitrate PM10. Whether the NOx and ammonia impacts are significant depends on the likelihood of ambient PM10 violations. The Bay Area Air Basin currently experiences violations of the state AAQS and is classified as a nonattainment area for the state PM10 AAQS. Staff thus considers both the primary and secondary PM10 emissions from the project to be a significant contribution to an existing problem.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis includes the effects of gaseous emissions (primarily NOx and SO2) and particulate (PM10) emissions on visibility impairment in the nearest Class I PSD areas, which are national parks and national wildlife refuges. The nearest Class I areas to the Russell City Energy Project are the Point Reyes National Seashore and the Pinnacles National Monument. The applicant used the USEPA model CALPUFF to assess the project's visibility impacts. The results from the CALPUFF modeling analysis indicate that under worst case ambient and operations conditions, the project's maximum visibility impacts at

Point Reyes National Seashore would be approximately a 3.67% change in extinction, and at the Pinnacles National Monument would be a 2.22% change in extinction. Both impacts are below the significance criteria of 5%. The project's visibility impacts on Class I areas is therefore considered insignificant.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impact analysis, staff needs specific information. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when that project applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that the applicant develop the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those future projects that are currently under construction, or are currently under District review in our cumulative impact analysis. Projects located up to six miles from the proposed facility site usually need to be included in the analysis.

The applicant identified all potential new sources within six miles of the project. The applicant obtained an inventory from BAAQMD identifying 17 proposed facilities within eight miles of the proposed project site that have not yet commenced operations. Eleven of these proposed facilities are sources of only POC, so only the remaining six were included in a cumulative modeling analysis. The maximum modeled cumulative impacts, and the portion of this maximum impact caused by the proposed RCEC, are presented below in AIR QUALITY Table 15. The total impact in this case is conservatively estimated to be the maximum modeled impact plus the maximum existing background pollutant levels.

AIR QUALITY Table 15
Maximum Modeled Cumulative Impacts ($\mu g/m^3$)

POLLUTANT	Averaging Time	Modeled Impact	RCEC Contribution	Background	Total Impact	Limiting Standard	Percent of Standard
NO2	1 hour	169	169	206.8	375.8	470	80%
	Annual	10.4	0.018	41.5	51.9	100	52%
SO2	1 hour	116.6	0	104.8	221.4	655	34%
	3 hour	74.49	0	52	126.5	1,300	10%
	24 hour	118.8	0	18.4	137.2	105	131%
	Annual	4.22	0.002	5.3	9.52	80	12%
PM10	24 hour	292.2	0.071	88	380.2	50	760%
	Annual Geo. Mean	60.1	0.06	21.9	82	30	273%
CO	1 hour	1230.6	1231	6440	7671	23,000	33%
	8 hour	415.9	0	3617	4033	10,000	40%

The maximum modeled 8 hour CO, annual NO2, and all SO2 impacts are due to the neighboring Union Sanitary District facility. The maximum modeled PM10 impacts are existing conditions caused by fugitive emissions from the Container Recycling Alliance facility. Note that these represent conservative, worst case estimates of local impacts from relatively small, ground level sources. Nevertheless, this analysis again shows that

the existing PM10 levels in the region are unacceptably high, and any further impact should be considered significant and be fully mitigated.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Construction Mitigation

The applicant proposes a number of mitigation and emissions control measures for use during the construction of the project. The applicant specifically proposes the following measures to control exhaust emissions from heavy diesel construction equipment:

- Operational measures, such as limiting time spent with the engine idling by shutting down equipment when not in use;
- Regular preventive maintenance to prevent emission increases due to engine problems;
- Use of low sulfur and low aromatic fuels meeting California standards for motor vehicle diesel fuel; and
- Use of low-emitting diesel engines meeting federal emissions standards for construction equipment.

The applicant further proposes the following measures to control fugitive dust emissions during construction of the project:

- Use either water application or chemical dust suppressant application to control dust emissions from unpaved road travel and unpaved parking areas;
- Use vacuum sweeping and/or water flushing of paved road surfaces to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard;
- Limit traffic speeds on unpaved roads to 15 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to roadways;
- Replant vegetation in disturbed areas as quickly as possible;
- Use wheel washers to wash off tires of all trucks exiting the construction site; and
- Mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant.

Operations Mitigation

The applicant proposes to reduce the project's air pollutant emissions impacts by using emission control equipment on the project, by providing emission offsets and by implementing a local PM10 Mitigation Plan.

PM10 and SO2 Controls

PM10 emissions will be limited by the use of a clean burning fuel (natural gas) and the efficient combustion process of the Siemens Westinghouse 501 Phase 2 combustion turbines. The use of natural gas with a maximum sulfur content of 0.25 grains per 100 scf as the only fuel will limit SO2 emissions.

NOx Controls

The primary NOx control method will be the use of turbines equipped with dry-low NOx combustors. This term refers to various CTG combustor design innovations that control NOx generation within the turbine combustor, without the addition of water or steam.

The CTG exhaust will also be treated with selective catalytic reduction (SCR) before release to the atmosphere. Selective catalytic reduction refers to a process that chemically reduces NOx to elemental nitrogen and water vapor by injecting ammonia into the flue gas stream in the presence of a catalyst and excess oxygen. The process is termed selective because the ammonia preferentially reacts with NOx rather than oxygen. The performance and effectiveness of SCR systems is directly related to operating temperature, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine are typically between 950° to 1100° F. Catalysts generally operate between 600° to 750° F (CARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. Below 600° F the ammonia reaction rate may start to decline, resulting in increased ammonia emissions called ammonia slip. At temperatures above approximately 800° F the catalyst may be damaged. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Newer catalysts (versus the older alumina-based catalysts) are more resistant to fuel sulfur fouling at temperatures below 770° F (EPRI 1990). Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

The applicant proposes to use an SCR system in conjunction with the dry-low NOx technology of the Siemens Westinghouse 501 Phase 2 combustion turbines chosen for the project. This will limit the NOx emissions from the two CTGs to 2.5 ppm @ 15% O2. The applicant proposes an averaging time of one (1) hour. In addition, the applicant proposes a maximum ammonia slip rate of 5 ppm.

CO and POC Controls

The applicant proposes only efficient combustion controls to control the project's potential CO and POC emissions.

PM10 Mitigation Plan

If built as proposed, the project will add approximately 86.3 tons per year of PM10 to the Bay Area Air Basin, resulting in a maximum ground level ambient impact increase of 3.78 $\mu g/m^3$ as shown in AIR QUALITY Table 13. Since the air basin already experiences violations of the state PM10 AAQS (AIR QUALITY Table 4), and is thus classified as nonattainment for that standard, this addition will contribute to existing violations, which staff considers a significant impact. Although the Bay Area Air Basin is classified as nonattainment for the state PM10 AAQS, the project will not be required by the BAAQMD to provide offsets because the quantity emitted is below the district's Offset Threshold of 100 tons per year (as set by district rule).

For these reasons, staff recommended that the applicant mitigate the project's PM10 impacts through the purchase of ERCs and/or a local mitigation plan. The applicant chose to prepare a PM10 Mitigation Plan, the most recent version of which was submitted to the CEC on April 5th, 2002.

The applicant proposes to fund the district's existing wood stove and fireplace retrofit/replacement program. Under this program, the BAAQMD will administrate distribution of approximately $900,000 as incentives for private individuals in and around the City of Hayward to retrofit or replace their older, uncertified wood stoves and fireplaces. Eligible individuals will receive an incentive payment of $300 to $500 for retrofitting or replacing their operational, uncertified wood stove or fireplace with a natural gas stove or fireplace insert. The BAAQMD will track the number of replacements and retrofits funded and will report periodically to the applicant and to the CPM.

Cooling Towers

Cooling tower drift consists of small water droplets, which contain particulate matter that originate from the total dissolved solids in the circulating water. To limit these particulate emissions, drift eliminators are installed in the cooling tower to capture these water droplets. The applicant intends to use drift eliminators on the cooling towers designed to limit drift to 0.0005 percent of the circulating water.

Emission Offsets

District Regulation 2-2-302 requires that the applicant provide emission offsets, in the form of banked Emission Reduction Credits (ERC), for the project's emissions increases of NOx and POC. The projected emissions of PM10 and SO2 are below the district's thresholds for requiring offsets. The applicant is in possession of sufficient offsets to satisfy their emissions liability. For facilities emitting more then 50 tons/year of NOx, the district requires a trading ratio of 1.15:1 (i.e. for every one ton of NOx emissions from the facility, 1.15 tons of NOx emission reduction credits must be provided). For facilities emitting between 15 and 50 tons/year of POC, the district requires a trading ratio of 1:1. For facilities emitting 50 tons/year POC or more, the district specifies a trading ratio of 1.15:1. A summary of the RCEC offset liability is presented below in AIR QUALITY Table 16.

The applicant is currently in possession of ERC certificates sufficient to fully satisfy these conditions. These certificate's numbers, the location of the source they were

derived from, and the amount of emissions reductions they represent are presented in AIR QUALITY Table 17 below.

AIR QUALITY Table 16
Emissions Offsets Liability (tons/year)

Pollutant	Emissions (tons/year)	Offset Ratio	Required Offsets
NOx	199.1	1.15:1.0	228.97
POC	28.72	1.0:1.0	28.72

AIR QUALITY Table 17
Emission Reduction Credits

ERC Number	Source (City)	NOx	SO2	PM10	POC	CO
# 671	Potrero Power Plant units 1 & 2 shutdown (San Francisco)	468.0	90.0	-	2.7	33.0
# 728	Pacific Refinery equipment shutdown (Hercules)	57.19	1.03	9.97	88.04	33.32

ADEQUACY OF PROPOSED MITIGATION

Construction Mitigation

As shown in AIR QUALITY Table 10 above, the applicant's proposed construction mitigation has been shown to limit impacts from NO2, SO2 and CO to a level of insignificance under worst case conditions. However, the significant PM10 impacts, both short term and annual, remain a concern. Staff believes that the emissions from the construction of the project could thus have a significant impact without further mitigation.

Operations Mitigation

PM10 Mitigation Plan

Ambient PM10 is generally a seasonal problem. As night falls, air near the ground cools relatively rapidly and sinks, pooling overnight along valley floors. This effect can lead to a "temperature inversion" where lighter, warmer air acts as a lid over the colder air pooled in valleys. Under such conditions air pollution will accumulate in the still cold air near the ground. These conditions are most likely to occur during cold fall and winter evenings. Pollution generated at such times tends to remain over night, exposing the local population to extended elevated concentrations of pollutants. This is particularly a problem among California's coastal mountain ranges due to the concentration of population centers (and thus pollution) along valley floors.

Though ambient PM10 levels in the Bay Area Air Basin in general have improved over the past fifteen years, numerous violations of the state PM10 AAQS continue to occur throughout the fall and winter quarters. The data also shows that violations of the state PM10 AAQS rarely occur during the summer and spring quarters. Staff therefore proposes that the applicant mitigate for the quantity of PM10 emissions generated by the project during the fall and winter quarters. Since this is half the year, staff proposes

that the applicant mitigate the impacts of 43.21 tpy, half the projects total annual emissions of 86.42 tpy.

Residential wood burning stoves and fireplaces produce significant quantities of PM10, CO, NO_2 and POC. Many of the POC produced by wood burning are themselves irritating, toxic and/or carcinogenic compounds such as benzene, formaldehyde and benzo-a-pyrene. In addition, cold winter evenings when people are most likely to use wood burning stoves and fireplaces are often the same times during which air pollution is least likely to dissipate, as described above, and ambient PM10 levels are likely to be highest. Wood burning stoves and fireplaces are particularly significant sources of air pollution at these times because the closer the pollution is generated to the ground, the more likely it will be trapped there. BAAQMD has identified wood smoke as the largest contributor to violations of the state's 24-hour PM10 standard in the Bay Area Air Basin.

Modern, USEPA-certified wood burning devices emit approximately ten percent as much pollutant per hour of operation compared to a conventional fireplace or simple wood stove. Natural gas fired fireplace inserts and heating systems emit less then one percent as much pollutant per hour. In addition, because the newer systems are more efficient at heating, the device will spend less time in operation, thus further reducing total emissions.

Upgrading residential wood burning devices can significantly reduce total pollutant impacts, particularly PM10 and PM10 precursors. These reductions will occur in the immediate vicinity of the retrofit and almost exclusively during the fall and winter quarters, when ambient PM10 is most problematic. Wood stove and fireplace retrofits and replacements are thus an excellent mitigation opportunity for the Russell City Energy Center.

The applicant proposes to replace approximately 900 wood stoves and retrofit approximately 1500 fireplaces. Based on fuel consumption and emissions estimates from CARB (ARB Area Source Methodology, Section 7.1, Residential Wood Burning) and USEPA (AP-42), the applicant estimates that the PM10 Mitigation Plan will secure the following emissions reductions, presented in AIR QUALITY Table 18 below.

AIR QUALITY Table 18
Emissions Reductions from Wood Stove and Fireplace Replacement/Retrofit

Type of Device	NOx	SO2	PM10	POC	CO
Emissions per Unit (Pounds/Year)					
Wood Stove	1.5	0.22	104.2	17.4	17.4
Fireplace	1.5	0.22	141.5	17.4	19.4
Gas Heater	0.062	0.00039	0.026	0.0072	0.0074
Emissions Reductions from PM10 Mitigation Plan (tpy)					
Wood Stoves	0.66	0.10	7.92	7.90	47.38
Fireplaces	1.10	0.17	14.84	13.29	108.34
TOTAL	**1.76**	**0.27**	**22.76**	**21.19**	**155.72**
Based on 0.56 tons (0.28 cords) of wood burned per stove/fireplace per year; AP-42 emission factors and replacement/retrofit of 919 wood stoves and 1532 fireplaces.					

As discussed in the modeling analysis section above, while the emissions are the actual mass of pollutants emitted, the impacts are the maximum concentration of pollutants from the project that people may be exposed to. In this case, since wood stoves and fireplaces emit near ground level, the impacts associated with this wood smoke will be much higher then the impacts associated with an equal quantity of pollutants emitted from the project. The applicant prepared a modeling analysis that predicts that one pound of PM10 emissions from a wood stove or fireplace produces an equivalent ground level impact to between 400 and 1500 pounds of PM10 from the project. While staff believes this is a rather optimistic estimate, it should be noted that the ratio of the necessary PM10 mitigation to the proposed PM10 mitigation is 1.90. In addition, the proposed wood stove and fireplace replacements and retrofits will yield a substantial reduction of NOx, SO2, CO and particularly POC. There are too many variables to quantitatively compare these emissions reductions to the facilities proposed PM10 impacts, but the qualitative benefits cannot be ignored.

Thus, staff is qualitatively convinced that if the specified number of wood stoves and fire places are retrofit/replaced, the benefit will be substantial enough to mitigate the projects PM10 emissions impacts to a level of insignificance.

Emission Controls

The applicant has proposed various emissions controls levels for the project. AIR QUALITY Table 19 presents the applicant's proposed control levels in comparison to the CARB recommended BACT levels.

AIR QUALITY Table 19
Comparison of Proposed Mitigation Levels (@ 15% O_2)

Emissions Source	Pollutant	Applicant Proposed	CARB Recommended BACT
CT/HRSG	NOx	2.5 ppmvd (1 hour average), and 2.0 ppmvd (annual average)	2.5 ppmvd (1 hour average)
CT/HRSG	CO	6 ppmvd (1 hour average)	6 ppmvd (3 hour average)
CT/HRSG	PM10	Fuel sulfur ≤0.25 gr/100 scf	Fuel sulfur ≤1 gr/100 scf
CT/HRSG	SO2	Fuel sulfur ≤ 0.25 gr/100 scf	Fuel sulfur ≤ 1 gr/100 scf
CT/HRSG	POC	1.0 ppmvd (1 hour average)	2.0 ppmvd, 3 hour average
Cooling Towers	PM10	0.0005% Drift Rate	N/A

In each case the proposed control levels are equal to or better then the CARB Recommended BACT. The proposed control levels are thus acceptable.

NOx Controls

The use of a Selective Catalytic Reduction (SCR) system to reach an emissions level at or below 2.5 ppmvd (1 hour average) satisfies BACT and is thus acceptable.

CO and POC Controls

To reduce the turbine carbon monoxide (CO) emissions, an oxidizing catalyst, similar in concept to catalytic converters used in automobiles, can be installed in the HRSG. The catalyst is usually coated with a noble metal, such as platinum, which will catalyze the oxidation of unburned hydrocarbons and CO to water vapor and carbon dioxide (CO2) respectively.

The applicant is proposing to meet the CO and POC emission levels without the use of an oxidizing catalyst. Most recent power plant projects of similar design are installing an oxidizing catalyst to meet these low emission levels. Proposed Condition of Certification AQ-23 requires the facility to be designed such that it can be retrofit with oxidation catalysts should the facility fail to meet the permitted emissions limits.

PM10 and SO2 Controls

The sole use of natural gas fuel with a certified sulfur content not greater 0.25 grains per 100 scf satisfies BACT requirements for both PM10 and SO2. Thus, the applicant's proposed control levels for these pollutants are acceptable.

Cooling Towers

The applicant's use of drift eliminators with an efficiency of 0.0005 percent on the proposed cooling tower represents the state-of-the-art of drift eliminator design. This level of emissions control is thus considered adequate.

Offsets

The proposed NOx and POC emissions offsets will fully mitigate the NOx and POC emissions from the project. Because ozone is a secondary pollutant generated from emissions of NOx and POC, the offset credits shown in AIR QUALITY Table 17 mitigate potential ozone impacts to a less than significant level. The CO emissions impacts from the project do not cause or contribute to a violation of any CO ambient air quality standard as shown in AIR QUALITY Table 13. Thus, assuming compliance with the emissions limits specified, the CO emissions from the project will not be significant.

STAFF PROPOSED MITIGATION

Construction Mitigation

The effectiveness of the proposed construction mitigation is measured as a percentage of the uncontrolled emissions that are avoided. This effectiveness can vary widely due to the number of influencing factors. Some of these factors include ambient conditions (temperature, wind & humidity), size & weight of vehicles, vehicle speed, number of vehicles and soil parameters (chemical composition, particle size distribution, organic components, etc.) The frequency of construction activities (disturbance of stabilized surfaces) and day to day aggressiveness of mitigation efforts (application of water or dust suppressants, street sweeping to remove carryout from paved roads, etc.) are further sources of uncertainty. Nevertheless, average control efficiency estimates have been developed. AIR QUALITY Table 20 below lists the estimated control efficiency of various construction mitigation measures based on an analysis of Best Available Control Measures (BACM) prepared by San Joaquin Valley Air Pollution Control District staff in October 2001.

AIR QUALITY Table 20
Construction Mitigation Estimated Control Efficiency

Source	Control Method	Percent Efficiency
Construction, Demolition and Earthmoving	Truck Load Covers	95
	Pave Roads	90
	Chemical Dust Suppressant	60
	Periodic Watering	50
Windblown Dust	Plant vegetation completely covering disturbed surface	99
	Chemical Dust Suppressant	75-80
Bulk Materials	Wind Fences	60-80
	Wet Suppression	56-81
Unpaved Roads & Parking Lost	Paving	99
	Chemical Dust Suppressant	75
	Gravel	60
	Reduce Traffic by 50%	50
	Set Speed Limits	37
Carryout to Paved Roads	Truck Load Covers	95
	Wheel Washers	75
	Paved Access Aprons	60
	Street Sweeping & Other Road Cleanup	45
Disturbed Open Areas & Vacant Lands	Re-vegetation, Chemical Dust Suppressants & Wind Fences	70
	Plant Trees as Windbreak	8

Experience has shown that a large degree of the uncertainty in these values is due to varying degrees of vigilance on the part of construction personnel. Particularly with respect to dust control of earth moving activities and unpaved roads, if the mitigation measures are applied correctly and with sufficient frequency the control efficiency can approach 100%.

The modeling analysis presents a worst case analysis of probable impacts and thus uses an average mitigation efficiency. Staff is confident that given a high degree of day to day vigilance on the part of construction personnel, the construction emissions from the project site will be minimized or eliminated and will not cause a new violation or significantly contribute to existing violations of the State PM10 AAQS.

The only way to guarantee a higher then average day to day mitigation effort is to set up real time up wind and down wind PM10 monitors around the site throughout construction. These monitors collect continuous ambient PM10 data from the air both before (up wind) and after (down wind) it flows over the construction site. The project's contribution can be determined by comparing the two values. Staff proposes that prior to the commencement of construction the applicant submit an Ambient Air Monitoring Program (AAMP) for review and approval that specifically identifies the protocols that will be used on site for detecting and reacting to possible elevated PM10 emissions from construction activities. In addition, staff proposes that prior to the commencement of construction the applicant submit a Fugitive Dust Mitigation Plan (FDMP) for review and approval that specifically spells out the mitigation measures necessary to limit fugitive dust during construction. Please see the Conditions of Certification section of this analysis for proposed conditions.

Operations Mitigation

Emission Controls

Staff is concerned that the project will be unable to meet the District proposed CO and POC control levels with combustion controls alone. In previous projects, emission levels set at similar low levels have required the use of an oxidizing catalyst. Staff proposes that the applicant agree to retrofit the project with an oxidizing catalyst if either the CO or POC limit is violated after commencement of operation.

FACILITY CLOSURE

Eventually the Russell City 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 cease as well.

A Permit to Operate, issued by the District under Regulation 2-3-302, is required for operation of the facility. 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 complied with state and District requirements and paid the fees to renew the Permit to Operate.

When the applicant decides to dismantle the project, there will potentially be emissions associated with the dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager will include the specific details regarding how the applicant plans to comply with all local, state and federal rules and regulations during facility closure and demolition.

COMPLIANCE WITH LORS

FEDERAL

USEPA has delegated full PSD authority to the District and the District issued the Final Determination of Compliance for the Russell City Energy Center on March 11, 2002. However, USEPA must consult with the US Fish and Wildlife Service before the PSD permit may be issued. The PSD permit and Authority to Construct will not be issued until after USEPA completes this consultation.

STATE

With the anticipated full mitigation (emissions offsets, mitigation and controls) discussed herein, staff anticipates compliance with Section 41700 of the California State Health and Safety Code.

LOCAL

The District issued the Final Determination of Compliance for the Russell City Energy Center on March 11, 2002 and found that the proposed project is in compliance with all District rules and regulations.

CONCLUSIONS AND RECOMMENDATIONS

Staff has reviewed the applicant's documentation and the District's FDOC and concludes that the project will not cause any significant impact on any ambient air quality standard, provided the following proposed Conditions of Certification are strictly adhered to. Staff recommends approval of the Russell City Energy Center.

CONSTRUCTION CONDITIONS OF CERTIFICATION

AQ-C1 The project owner/operator shall submit the resume(s) of their selected Construction Mitigation Manager(s) (CMM) and Fugitive Dust Mitigation Manager(s) (FDMM) to the CEC Compliance Project Manager (CPM) for approval. The owner/operator shall be responsible for funding the costs of the CMM and FDMM, however the CMM and FDMM shall report to the CPM. The CMM and FDMM shall preferably have a minimum of 8 years experience as follows, however the CPM shall consider all resumes submitted regardless of experience:

- 5 years construction experience as a subcontractor or general contractor.
- An engineering degree or an additional 5 years construction experience.
- 1 year construction project management experience.
- 2 years air quality assessment experience.

The project owner/operator shall make available a dedicated office for both the CMM and FDMM. The CMM shall be responsible for implementing all mitigation measures related to construction equipment combustion emissions, as outlined in Conditions of Certification **AQ-C4** . The FDMM shall be responsible for monitoring and enforcing the effectiveness of all mitigation measures for construction as outlined in Conditions of Certification **AQ-C3** and **AQ-C5**. A CMM shall be on-site or available to be on-site at any time, until deemed no longer necessary by the CPM. A FDMM shall be onsite during all construction activities, until deemed no longer necessary by the CPM. The CMM and FDMM shall be granted access to all areas of the main and related linear facility construction sites. The CMM and FDMM shall have the authority to stop construction on either the main or the related linear facility construction sites as warranted by specific mitigation measures. The CMM and/or FDMM may not be terminated prior to the cessation of all construction activities unless approval is granted by the CPM.

Verification: The project owner/operator shall submit the CMM and FDMM resume(s) to the CPM for approval at least sixty (60) days prior to site mobilization.

AQ-C2 The CMM and FDMM shall submit to the CPM for approval, a Monthly Construction Compliance Report (MCCR). The MCCR will, at a minimum, summarize all compliance actions taken germane to Conditions of Certification **AQ-C3**, **AQ-C4** and **AQ-C5**. The MCCR shall include, at a minimum, the following elements:

Fugitive Dust Mitigation Monthly Report
(see Condition of Certification AQ-C3 and AQ-C5)

- Identification of specific mitigation measure performed, the location performed, date performed and date enforced or verified as remaining effective.
- Identification of any transgressions or circumventions of mitigation measure and the actions taken to correct the situation.
- Identification of any observation by the FDMM of dust plumes beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) where taken to abate the plume.
- A summary report of all ambient air monitoring data.

Diesel Construction Equipment Mitigation Monthly Report
(see Condition of Certification AQ-C4)

- Identification of any changes, as approved by the CPM, to the Diesel Construction Equipment Mitigation Plan from the initial report or the last monthly report including any new contractors and their diesel construction equipment.
- A Copy of all receipt or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date for the main and related linear construction sites.
- Identification and verification of all diesel engines required to meet EPA or CARB 1996 off-road diesel equipment emission standards.
- The suitability of the use of a catalyzed diesel particulate filter for a specific piece of construction equipment is to be determined by a qualified mechanic or engineer who must submit a report through the CMM to the CPM for approval. The identification of any suitability report being initiated, pursued or the completed report should be included the monthly report (in the month that it was completed) as should the verification of any subsequent installation of a catalyzed diesel particulate filter.
- Identification of any observation by the CMM of dark plumes emanating from diesel-fire construction equipment beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) where taken to abate the plume or future expected plumes.

Verification: The CMM and FDMM shall submit to the CPM for approval, the Monthly Construction Compliance Report (MCCR) for each month by the 15th (or the following Monday if the 15th is a Saturday or Sunday) of the following month while construction is occurring at the main or related linear construction sites.

AQ-C3 The FDMM shall prepare and submit to the CPM for approval a Fugitive Dust Mitigation Plan (FDMP) that specifically identifies all fugitive dust mitigation measures that will be employed for the construction of the facility and is administered on site by the full time FDMM.

The construction mitigation measures that shall be addressed in the FDMP include, but are not limited to, the following:

- Identification of the employee parking area(s) and surface composition of those parking area(s)
- The frequency of watering of unpaved roads and all disturbed areas
- Application of chemical dust suppressants
- Gravel in high traffic areas
- Paved access aprons
- Sandbags to prevent run off
- Posted speed limit signs
- Wheel washing areas prior to large trucks leaving the project site
- Methods that will be used to clean tracked-out mud and dirt from the project site onto public roads
- For any transportation of borrowed fill material

    1. Vehicle covers
    2. Wetting of the transported material
    3. Appropriate freeboard

- Methods for the stabilization of storage piles and disturbed areas
- Windbreaks at appropriate locations
- Additional mitigation measures to be implemented at the direction of the FDMM in the event that the standard measures fail to completely control dust from any activity and/or source
- The suspension of all earth moving activities under windy conditions
- On-site monitoring devices

In monitoring the effectiveness of all mitigation measures included in the FDMP, the FDMM shall take into account the following, at a minimum:

a) Onsite spot checks of soil moisture content at locations where soil disturbance, movement and/or storage is occurring;

b) Visual observations of all construction activities; and

c) The results of measurements by portable PM10 instruments (as described in **AQ-C5**).

The FDMM shall implement the following procedures for additional mitigation measures if the FDMM determines that the existing mitigation measures are not resulting in adequate mitigation:

1. The FDMM shall direct more aggressive application of the existing mitigation methods within fifteen (15) minutes of making such a determination.

2. The FDMM shall direct implementation of additional methods of dust suppression if step #1 specified above fails to result in adequate mitigation within thirty (30) minutes of the original determination.

3. The FDMM shall direct a temporary shutdown of the source of the emissions if step #2 specified above fails to result in adequate mitigation within one (1) hour of the original determination. The activity shall not restart until one (1) full hour after the shutdown. The owner/operator may appeal to the CPM any directive from the FDMM to shutdown a source, provided that the shutdown shall go into effect within one (1) hour of the original determination unless overruled by the CPM before that time.

Verification: At least thirty (30) days prior to site mobilization, the project owner/operator shall provide the CPM with a copy of the Fugitive Dust Mitigation Plan (FDMP) for approval. Site mobilization shall not commence until the project owner/operator receives approval of the FDMP from the CPM.

AQ-C4 The CMM shall prepare and submit to the CPM for approval a Diesel Construction Equipment Mitigation Plan (DCEMP) that will specifically identify diesel engine mitigation measures that will be employed during the construction phase of the main and related linear construction sites. The CMM will be responsible for implementing and maintaining all measure identified in the DCEMP. The DCEMP shall address, at a minimum, the following mitigation measures:

- Catalyzed diesel particulate filters (CDPF);
- CARB certified ultra low sulfur diesel fuel, containing 15ppm sulfur or less (ULSD);
- Diesel engines certified to meet EPA and/or CARB 1996 or better off-road equipment emission standards.
- Restricting diesel engine idle time, to the extent practical, to no more than 10 minutes.

The Diesel Construction Equipment Mitigation Plan must include the following:

1. A list of all diesel-fueled, off-road, stationary or portable construction-related equipment to be used either on the main or the related linear construction sites. This list will initially be estimated and then subsequently be updated as specific contractors become identified. Prior to a contractor gaining access to the main or related linear construction sites, the CMM will submit to the CPM for approval, an update of this list including all of the new contractor's diesel construction equipment.

2. Each piece of construction equipment listed under item #1 of this condition must demonstrate compliance according to the following mitigation requirements, except as noted in items #3, #4 and #5 of this condition:

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

3. If the construction equipment is intended to be on-site for ten (10) days or less, then none of the mitigation measures identified in item #2 of this condition are required.

4. The CPM may grant relief from the mitigation measures listed in item #2 of this condition for a specific piece of equipment if the CMM can demonstrate that they have made a good faith effort to comply with the mitigation measures and that compliance is not possible.

5. Any implemented mitigation measure in item #2 of this condition may be terminated immediately if one of the following conditions exists, however the CPM must be informed within ten (10) working days of the termination:

   5.1 The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in back pressure.

   5.2 The measure is causing or is reasonably expected to cause significant engine damage.

5.3 The measure is causing or is reasonably expected to cause a significant risk to workers or the public.

5.4 Any other seriously detrimental cause which has approval by the CPM prior to the termination being implemented.

6. All contractors must agree to limit diesel engine idle time on all diesel-powered equipment to no more than ten (10) minutes, to the extent practical.

Verification: The CMM shall submit the initial Diesel Construction Equipment Mitigation Plan (DCEMP) to the CPM for approval at least thirty (30) days prior to site mobilization. The CMM will update the initial DCEMP as necessary, no less than ten (10) days prior to a specific contractor gaining access to either the main or related linear construction sites. The CMM will notify the CPM of any emergency termination within ten (10) working days of the termination.

AQ-C5 The FDMM shall prepare and implement an Ambient Air Monitoring Program (AAMP) to measure PM10 emissions during excavation, earthmoving and grading activities. The project owner/operator shall submit the AAMP to the CPM for review and approval. The AAMP shall include, at a minimum, the following:

1. The use of real-time PM10 monitoring instruments;

2. The simultaneous use of upwind and downwind monitors continuously during these activities;

3. Description of how the monitors will be used to assess the effectiveness of the mitigation measures implemented under the FDMP, including assessing the potential need for monitoring multiple activities on site simultaneously;

Verification: The AAMP shall be included as part of the FDMP required by Condition of Certification **AQ-C3**. Monitoring records, including monitoring data from all upwind and downwind monitors, and records of dust suppression measures implemented, shall be maintained on-site throughout construction and shall be made available to the CPM upon request. A summary of the monitoring records and the dust suppression activities shall be included in each MCCR. Any changes to the AAMP or associated protocols require approval from the CPM.

OPERATIONS CONDITIONS OF CERTIFICATION

All definitions presented in the Bay Area Air Quality Management District's Final Determination of Compliance for the Russell City Energy Center apply to the following Conditions of Certification.

Process Equipment

S-1 Combustion Turbine Generator (CTG) #1, Westinghouse 501F, 1979.4 MMBtu/hr maximum rated capacity, natural gas fired only; Abated by A-1 Selective Catalytic Reduction (SCR) System.

S-2 Heat Recovery Steam Generator (HRSG) #1, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-1 Selective Catalytic Reduction (SCR) System.

S-3 Combustion Turbine Generator (CTG) #2, Westinghouse 501F, 1979.4 MMBtu/hr maximum rated capacity, natural gas fired only; Abated by A-2 Selective Catalytic Reduction (SCR) System.

S-4 Heat Recovery Steam Generator (HRSG) #2, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-2 Selective Catalytic Reduction (SCR) System.

S-5 Cooling Tower, Ten Cells, 135000 gallons per minute

S-6 Emergency Generator, with Caterpillar G3512-90-LE natural gas-fired engine, 660 kW, 6.44 MMBtu/hr input

S-7 Diesel Engine, Cummins 6CTA8.3-F3, 400 hp, 2.11 MMBtu/hr input

AQ-1 The owner/operator of the RCEC shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-3 Gas Turbines and S-2 and S-4 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. Conditions **AQ-1** through **AQ-12** shall only apply during the commissioning period as defined in the District FDOC. Unless otherwise indicated, Conditions **AQ-13** through **AQ-56** shall apply after the commissioning period has ended.

Verification: The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by condition **AQ-5** and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by condition **AQ-11**.

AQ-2 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1 & S-3 Gas Turbine combustors and S-2 & S-4 Heat Recovery Steam Generator duct burners to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by condition **AQ-5** and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by condition **AQ-11**.

AQ-3 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate the SCR systems to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators.

Verification: The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by condition **AQ-5** and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by condition **AQ-11**.

AQ-4 Coincident with the as-designed operation of A-1 & A-2 SCR Systems, pursuant to conditions **AQ-3**, **AQ-10**, **AQ-11**, and **AQ-12**, the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) the owner/operator shall operate the facility in a manner such that comply with the NOx and CO emission limitations specified in conditions **AQ-20(a)** through **AQ-20(d)**.

Verification: The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by condition **AQ-5** and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by condition **AQ-11**.

AQ-5 The owner/operator of the RCEC shall submit a plan to the District Permit Services Division and the CPM describing the procedures to be followed during the commissioning of the gas turbines and HRSGs. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NOx combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NOx continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) without abatement by their respective SCR System. Neither Gas Turbine (S-1 or S-3) shall be fired sooner than 28 days after the District receives the commissioning plan.

Verification: The project owner/operator shall submit a Commissioning Plan to the District Permit Services Division and the CPM for approval at least four (4) weeks prior to first fire of S-1, S-2, S-3 and S-4.

AQ-6 During the commissioning period, the owner/operator of the RCEC shall demonstrate compliance with conditions **AQ-8** through **AQ-11** through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

a. firing hours for each gas turbine (S-1 and S-3) and each HRSG (S-2 and S-4)
b. fuel flow rates to each train
c. stack gas nitrogen oxide emission concentrations at P-1 and P-2
d. stack gas carbon monoxide emission concentrations P-1 and P-2
e. stack gas carbon dioxide concentrations P-1 and P-2

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4). The owner/operator shall use District-approved methods to calculate heat input rates, NOx mass emission rates, carbon monoxide mass emission rates, and NOx and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

Verification: The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by condition **AQ-5** and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by condition **AQ-11**.

AQ-7 The owner/operator shall install, calibrate, and make operational District-approved continuous emission monitors specified in condition 6 prior to first firing of the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4). After first firing of the turbines and auxiliary boilers, the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NOx emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: The project owner/operator shall notify the District and CPM of the date of expected first fire at least thirty (30) days prior to first fire and shall make the project site available for inspection if desired by either the District or CPM. The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by condition **AQ-5** and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by condition **AQ-11**.

AQ-8 The owner/operator shall not operate the facility such that the total number of firing hours of S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-1 SCR System shall not exceed 300 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by condition **AQ-11**.

AQ-9 The total number of firing hours of S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-2 SCR System shall not exceed 300 hours during the commissioning period. Such

operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by condition **AQ-11**.

AQ-10 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition **AQ-25**.

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by condition **AQ-11**.

AQ-11 Combined pollutant mass emissions from the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1 & S-3).

NOx (as NO2)	7,880 pounds per calendar day	400 pounds per hour
CO	17,716 pounds per calendar day	584 pounds per hour
POC (as CH4)	230 pounds per calendar day	
PM10	456 pounds per calendar day	
SO2	77 pounds per calendar day	

Verification: During the Commissioning Period, as defined in the district FDOC, the project owner/operator shall submit to the CPM for approval, a Monthly Emissions Report that includes, but is not limited to, fuel use, turbine operation, post combustion control operation, ammonia use and CEM readings on an hourly and daily basis. The Monthly Emissions Report for each month must be submitted by the 15th (or the following Monday if the 15th is a Saturday or Sunday) of the following month.

AQ-12 Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with condition **AQ-20**. The source test shall determine NOx, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods.

Verification: No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed

source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within thirty (30) days of the source testing date.

Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs; S-2 & S-4)

AQ-13 The owner/operator shall fire the Gas Turbines (S-1 and S-3) and HRSG Duct Burners (S-2 and S-4) exclusively on natural gas. (BACT for SO2 and PM10)

Verification: The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and CEC.

AQ-14 The owner/operator shall not exceed 2,179.4 MM Btu per hour, averaged over any rolling 3-hour period from the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4). (PSD for NOx)

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-15 The owner/operator shall not exceed 52,306 MM Btu per calendar day from the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4). (PSD for PM10)

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-16 The owner/operator shall not exceed 34,679,108 MM Btu per year from the combined cumulative heat input rate for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4). (Offsets)

Verification: A detailed report of fuel use and equipment operation shall be included in each January 30 Quarterly Air Quality Report as required by the verification of condition **AQ-36**.

AQ-17 The owner/operator shall not fire HRSG duct burners (S-2 and S-4) unless its associated Gas Turbine (S-1 and S-3, respectively) is in operation. (BACT for NOx)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-18 The owner/operator shall properly operate and properly maintain A-1 Selective Catalytic Reduction (SCR) System except as provided in condition **AQ-8**, whenever fuel is combusted at S-1 Gas Turbine and/or S-2 HRSG and A-1 catalyst bed has reached minimum operating temperature. (BACT for NOx)

Verification: The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and CEC.

AQ-19 The owner/operator shall properly operate and properly maintain A-2 Selective Catalytic Reduction (SCR) System except as provided in condition **AQ-9**, whenever fuel is combusted at S-2 Gas Turbine and/or S-4 HRSG and A-2 catalyst bed has reached minimum operating temperature. (BACT for NOx)

Verification: The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and CEC.

AQ-20 The owner/operator of Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (BACT, PSD, and Toxic Risk Management Policy)

(a) Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO2) at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after abatement by A-1 SCR System) shall not exceed 19.5 pounds per hour or 0.0090 lb/MM Btu (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO2) at P-2 (the combined exhaust point for the S-2 Gas Turbine and the S-4 HRSG after abatement by A-2 SCR System) shall not exceed 19.5 pounds per hour or 0.0090 lb./MM Btu (HHV) of natural gas fired. (PSD for NOx)

(b) The nitrogen oxide emission concentration at emission points P-1 and P-2 each shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O2, averaged over any 1-hour period. (BACT for NOx)

(c) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 0.0087 lb./MM Btu (HHV) of natural gas fired or 28.3 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)

(d) The carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 4 ppmv, on a dry basis, corrected to 15% O2, averaged over any rolling 3-hour period. (BACT for CO)

(e) Ammonia (NH3) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O2, averaged over any rolling 3-hour period. The continuous recording of the ammonia injection rate to A-1 and A-2 SCR Systems shall verify this ammonia emission concentration. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-2 SCR System ammonia injection rates, and corresponding ammonia emission

concentration at emission points P-1 and P-2 shall be determined in accordance with permit condition **AQ-31**. (TRMP for NH3)

(f) Precursor organic compound (POC) mass emissions (as CH4) at P-1 and P-2 each shall not exceed 2.72 pounds per hour or 0.00125 lb/MM Btu of natural gas fired. (BACT)

(g) Sulfur dioxide (SO2) mass emissions at P-1 and P-2 each shall not exceed 1.51 pounds per hour or 0.0007 lb/MM Btu of natural gas fired. **Sulfur content of the natural gas shall not exceed 0.25 grains/100 scf.** (BACT)

(h) Particulate matter (PM10) mass emissions at P-1 and P-2 each shall not exceed 9 pounds per hour or 0.00455 lb/MM Btu of natural gas fired when the HRSG duct burners are not in operation. Particulate matter (PM10) mass emissions at P-1 and P-2 each shall not exceed 12 pounds per hour or 0.00551 lb./MM Btu of natural gas fired when the HRSG duct burners are in operation. (BACT)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-21 The owner/operator shall operate the facility such that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or a shutdown **does not** exceed the following limits: (PSD)

	Cold Start-Up (lb/start-up)	Hot Start-Up (lb/start-up)	Shutdown (lb/shutdown)
Oxides of Nitrogen (as NO_2)	240	80	18
Carbon Monoxide (CO)	2,514	902	43.8
Precursor Organic Compounds (as CH_4)	48	16	5

Verification: The project owner/operator shall submit documentation of compliance with the emission limits in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-22 The owner/operator shall not operate in start-up mode for both Gas Turbines (S-1 and S-3) simultaneously. (PSD)

Verification: The project owner/operator shall submit documentation of all start-up events as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-23 The owner/operator shall design and construct the heat recovery steam generators (S-2 & S-4) and associated ducting such that an oxidation catalyst can be readily installed and properly operated if deemed necessary by the APCO **or CPM** to insure compliance with the CO **and/or POC** emission rate limitations of conditions **AQ-20(c), AQ-20(d)** and **AQ-20(f)**. (BACT)

Verification: Prior to the first firing of natural gas in either turbine the owner/operator shall provide as built drawings or other suitable proof of compliance with this Condition of Certification to the District and the CPM.

AQ-24 The owner/operator shall not exceed the total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during Gas Turbine start-ups and shutdowns for the following limits during any calendar day:

(a)	1,364 pounds of NOx (as NO2) per day	(CEQA)
(b)	7,882 pounds of CO per day	(PSD)
(c)	230 pounds of POC (as CH4) per day	(CEQA)
(d)	456 pounds of PM10 per day	(PSD)
(e)	78 pounds of SO2 per day	(BACT)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-25 The owner/operator shall not exceed the cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), Cooling Tower (S-5), Emergency Generator (S-6) and Fire Pump Engine (S-7), including emissions generated during gas turbine start-ups and shutdowns for the following limits during any consecutive twelve-month period:

(a)	134.6 tons of NOx (as NO2) per year	(Offsets, PSD)
(b)	584.2 tons of CO per year	(Cumulative Increase, PSD)
(c)	27.8 tons of POC (as CH4) per year	(Offsets)
(d)	86.4 tons of PM10 per year	(Cumulative Increase, PSD)
(e)	12.2 tons of SO2 per year	(Cumulative Increase)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-26 The owner/operator shall not exceed 7 tons in any consecutive four quarters of sulfuric acid emissions (SAM) from P-1 and P-2. (Basis: PSD)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-27 The owner/operator shall not exceed the maximum projected annual toxic air contaminant emissions (per condition **AQ-29**) from the Gas Turbines and HRSGs combined (S-1, S-2, S-3, and S-4) for the following limits:

3,726	Pounds of formaldehyde per year
2,324	Pounds of acetaldehyde per year
218	Pounds of acrolein per year
461	Pounds of benzene per year
22.4	Pounds of specified polycyclic aromatic hydrocarbons (PAHs) per year unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator may request that the District and the CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

Verification: If prepared, the health risk analysis shall be submitted to the District and the CPM within sixty (60) days of the source test date. Otherwise, the project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the January 30 Quarterly Air Quality Report each year required by the verification of condition **AQ-36**.

AQ-28 The owner/operator shall demonstrate compliance with conditions **AQ-14** through **AQ-17**, **AQ-20(a)** through **AQ-20(d)**, **AQ-21**, **AQ-24(a)**, **AQ-24(b)**, **AQ-25(a)**, and **AQ-25(b)** by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

(a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-3 combined and S-2 & S-4 combined.
(b) Carbon Dioxide (CO2) or Oxygen (O2) concentrations, Nitrogen Oxides (NOx) concentrations, and Carbon Monoxide (CO) concentrations at each of the following exhaust points: P-1 and P-2.
(c) Ammonia injection rate at A-1 and A-2 SCR Systems
(d) Steam injection rate at S-1 & S-3 Gas Turbine Combustors

The owner/operator shall record all of the above parameters every fifteen (15) minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and average hourly pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

(e) Heat Input Rate for each of the following sources: S-1 & S-3 combined and S-2 & S-4 combined.

(f) Corrected NOx concentrations, NOx mass emissions (as NO2), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1 and P-2. Applicable to emission points P-1 and P-2, the owner/operator shall record the parameters specified in conditions **AQ-28(e)** and **AQ-28(f)** at least once every fifteen (15) minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

(g) Total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.

(h) On an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined and all four sources (S-1, S-2, S-3, and S-4) combined.

(i) The average Nox mass emissions (as NO2), CO mass emissions, and corrected NOx and CO emission concentrations for every clock hour and for every rolling 3-hour period.

(j) On an hourly basis, the cumulative total NOx mass emissions (as NO2) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, and all four sources (S-1, S-2, S-3, and S-4) combined.

(k) For each calendar day, the average hourly Heat Input Rates, Corrected NOx emission concentrations, NOx mass emissions (as NO2), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.

(l) On a daily basis, the cumulative total NOx mass emissions (as NO2) and cumulative total CO mass emissions, for the previous consecutive twelve-month period for all four sources (S-1, S-2, S-3, and S-4) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

Verification: The project owner/operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-29 To demonstrate compliance with conditions **AQ-20(f)**, **AQ-20(g)**, **AQ-20(h)**, **AQ-24(c)** through **AQ-24(e)**, **AQ-25(c)** through **AQ-25(e)**, and **AQ-26**, the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM10) mass emissions (including condensable particulate matter), Sulfur Dioxide (SO2) mass emissions, and sulfuric acid mist (SAM) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to condition **AQ-28**, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

(a) For each calendar day, POC, PM10, SO2, and SAM emissions shall be

summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3, and S-4) combined and

(b) On a daily basis, the 365-day rolling average cumulative total POC, PM10, SO2, and SAM mass emissions, for all four sources (S-1, S-2, S-3, and S-4) combined.

(Offsets, PSD, Cumulative Increase)

Verification: The project owner/operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-30 To demonstrate compliance with condition **AQ-27**, the owner/operator shall calculate and maintain record on an annual basis the maximum projected annual emissions of: Acetaldehyde, Acrolein, Formaldehyde, Benzene, and Specified PAHs. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 34,679,088 MM Btu/year and the highest emission factor (pounds of pollutant per MM Btu of Heat Input) determined by any source test of the S-1 & S-3 Gas Turbines and/or S-2 & S-4 Heat Recovery Steam Generators. (TRMP)

Verification: The project owner/operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-31 After start-up of the RCEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 to determine the corrected ammonia (NH3) emission concentration to determine compliance with condition **AQ-20(e)**. The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-2 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to minimum, 70%, 85%, and 100% load) to establish the range of ammonia injection rates necessary to achieve NOx emission reductions while maintaining ammonia slip levels. Continuing compliance with condition **AQ-20(e)** shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (TRMP)

Verification: Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-32 After start-up of the RCEC and on an annual basis thereafter the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with conditions **AQ-20(a)**, **(b)**, **(c)**, **(d)**, **(f)**, **(g)**, and **(h)**, while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Conditions **AQ-20(c)** and **(d)**, and to verify the accuracy of the continuous emission monitors required in condition **AQ-27**. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM10) emissions including condensable particulate matter. (BACT, offsets)

Verification: Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-33 After start-up of the RCEC and on a quarterly basis thereafter, the owner/operator shall conduct a District approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to demonstrate compliance with the SAM levels in condition **AQ-26**. The owner/operator shall test for (as a minimum) SO2, SO3, SAM and ammonium sulfates. After acquiring one year of source test data on these units, the owner/operator may petition the District to switch to annual source testing if test variability is low. (Basis: PSD Avoidance, SAM Periodic Monitoring)

Verification: Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-34 After start-up of the RCEC and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Condition **AQ-27**. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to condition **AQ-30** for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

Acetaldehyde	≤	72 pounds/year
Acrolein	≤	3.9 pounds/year
Benzene	≤	26.8 pounds/year
Formaldehyde	<	132 pounds/year
Specified PAHs (TRMP)	≤	0.18 pounds/year

Verification: Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-35 The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CPM in writing of the source test protocols and projected test dates at least seven (7) days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM10 emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CPM within sixty (60) days of conducting the tests. (BACT)

Verification: The project owner/operator shall submit documentation of the procedures and results of each source test conducted as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-36 The owner/operator of the RCEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or

Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: The project owner/operator shall submit a Quarterly Air Quality Report (QAQR) for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year. Each QAQR shall include, but not be limited to, a compliance matrix, a summary of operations activities, and a summary of all reports covered by this condition. The January 30 report for each year shall include an annual summary of the four Quarterly Air Quality Reports covering the preceding calendar year. The reports shall be submitted to the California Energy Commission Compliance Project Manager (CPM).

AQ-37 The owner/operator of the RCEC shall maintain all records and reports on site for a minimum of five (5) years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CPM staff upon request. (Regulation 2-6-501)

Verification: The project owner/operator shall maintain a copy of each Quarterly Air Quality Report on site for a minimum of five (5) years.

AQ-38 The owner/operator of the RCEC shall notify the District and the CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

Verification: The owner/operator shall include a compliance matrix in the Quarterly Air Quality Report required by the verification of condition **AQ-36**. The Compliance Matrix shall summarizing the project's compliance status for each condition during the reporting period.

AQ-39 The owner/operator shall install the exhaust stacks (P-1 and P-2) that are at least 145 feet above grade level from the stack base. (PSD, TRMP)

Verification: Prior to the first firing of natural gas in either turbine the owner/operator shall provide as built drawings of the stack or other suitable proof of the minimum stack height to the District and the CPM.

AQ-40 The owner/operator of the RCEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Regulation 1-501)

Verification: Prior to the first firing of natural gas in either turbine the owner/operator shall provide as built drawings or other suitable proof of compliance with this Condition of Certification to the District and the CPM.

AQ-41 Within 180 days of the issuance of the Authority to Construct for the RCEC, the owner/operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required by conditions **AQ-28**, **AQ-31**, **AQ-32**, **AQ-33**, **AQ-34** and **AQ-48**. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-42 Prior to the issuance of the BAAQMD Authority to Construct for the RCEC, the owner/operator shall provide to the District valid emission reduction credit banking certificates in the amount of 154.8 tons/year of Nitrogen Oxides and 27.8 tons/year of Precursor Organic Compounds or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2. (Offsets)

Verification: The project owner/operator must submit all ERC documentation to the District and the CPM prior to the issuance of the BAAQMD Authority to Construct.

AQ-43 Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the RCEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of the issuance of the PSD Permit. (Regulation 2-6-404.1)

Verification: The owner/operator shall notify the CPM within ten (10) working days of any application for, issuance of, and/or modification to any permit pertaining to air quality.

AQ-44 Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the RCEC shall not operate either of the gas turbines until either: 1) a Title IV Operating Permit has been issued; 2) 24 months after a Title IV Operating Permit Application has been submitted, whichever is earlier. (Regulation 2, Rule 7)

Verification: The owner/operator shall notify the CPM within ten (10) working days of any application for, issuance of, and/or modification to any permit pertaining to air quality.

AQ-45 The owner/operate of the RCEC shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-46 The owner/operator shall take monthly samples of the natural gas at the RCEC facility. The samples shall be analyzed for sulfur content using District-approved laboratory methods or the owner/operator shall obtain certified analytical results from the gas supplier. The sulfur content test results shall retain records on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. (cumulative increase)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-47 The owner/operator shall install and maintain the high-efficiency mist eliminators with a maximum guaranteed drift rate of at least 0.0005% such that S-5 Cooling Tower minimizes the drift losses. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 2,000 ppmw (mg/l). The owner/operator shall sample the water at least once per day. (PSD)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification, including a summary of all data collected in relation to this condition, as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-48 The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the Russell City Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within sixty (60) days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM10 emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in condition **AQ-47**. The CPM may, in years five (5) and fifteen (15) of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in condition **AQ-47**. (PSD)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification, including color photographs, as part of the January Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-49 The owner/operator shall fire the S-6 Emergency Generator exclusively on natural gas. (Toxics, Cumulative Increase).

Verification: The project owner/operator shall include documentation of natural gas fuel use of the S-6 Emergency Generator as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-50 The owner/operator shall operate the S-6 Emergency Generator for no more than 100 hours per year for the purpose of reliability testing or in anticipation of imminent emergency conditions. Emergency conditions are: (1) Failure of a regular power supply, or (2) involuntary curtailment of a power supply (where the utility that provides regular power has been instructed by the ISO to shed firm load, or where the utility has actually shed firm load). (Cumulative Increase)

Verification: The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-51 The owner/operator equip the S-6 Emergency Generator with a non-resettable totalizing counter that records hours of operation. (BACT)

Verification: The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and CEC.

AQ-52 The owner/operator shall maintain the following monthly records in a District-approved log for at least 5 years and shall be made available to the District upon request: (BACT)

a. Total number of hours of operation for S-6 Emergency Generator
b. Fuel usage at S-6 Emergency Generator

Verification: The project owner/operator shall submit documentation of S-6 Emergency Generator hours of operation and fuel use as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-53 The owner/operator shall fire the S-7 Fire Pump Engine exclusively on diesel fuel having a sulfur content no greater than 0.05% by weight. (Toxics, Cumulative Increase)

Verification: The project owner/operator shall submit documentation S-7 Fire Pump Engine diesel fuel use and sulfur content certification as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-54 The owner/operator shall operate the S-7 Fire Pump Engine for no more than 30 hours per year for the purpose of reliability testing and non-emergency operation. (Toxics)

Verification: The project owner/operator shall submit documentation S-7 Fire Pump Engine hours of operation as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-55 The owner/operator shall equip the S-7 Fire Pump Engine with a non-resettable totalizing counter that records hours of operation. (BACT)

Verification: The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and CEC.

AQ-56 The owner/operator shall maintain the following monthly records in a District-approved log for at least five (5) years and shall make such records readily available for District inspection upon request: (BACT)

a. Total number of hours of operation for S-7 Fire Pump Engine
b. Fuel usage at S-7 Fire Pump Engine

Verification: The project owner/operator shall submit documentation of S-7 Fire Pump Engine hours of operation and fuel use as part of the Quarterly Air Quality Report required by the verification of condition **AQ-36**.

AQ-57 The project owner/operator shall submit a copy of any proposed modifications to the Authority to Construct and/or Permit to Operate issued by the district, and shall provide a written description of any other air quality related permit modification to the CPM for review and approval.

If the CPM concurs with the process undertaken by, and the decision of, the local air district or other agency concerning any permit modifications, no Commission action (amendment) will be required.

Verification: The project owner/operator shall submit a copy of any request to modify the local air district permits within five (5) days of filing the requested modification to the CPM. The project owner/operator shall provide a written description of any other proposed modification within ten (10) days to the CPM.

AQ-58 The project owner/operator shall fully implement the PM10 Mitigation Plan in cooperation with the Bay Area Air Quality Management District as outlined in the Amended PM10 Mitigation Plan prepared by the applicant and docketed on April 5th, 2001. All retrofits and replacements shall be completed within twenty-four (24) months of commencement of first turbine roll.

Verification: The project owner/operator shall submit a PM10 Mitigation Progress Report as a part of each Quarterly Air Quality Report required by the verification of condition **AQ-36**. Once all required emissions efforts have been completed, the applicant shall submit a Final PM10 Mitigation Report within sixty (60) days. The report shall provide detailed documentation of the entire mitigation effort including, but not limited to, funds spent and the exact number of fireplaces and wood stoves retrofit/replaced.

APPENDIX A

Wind Rose Diagrams

BIOLOGICAL RESOURCES

Testimony of Stuart Itoga and Rick York

INTRODUCTION

This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the Russell City Energy Center (RCEC). This analysis addresses potential impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of appurtenant facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the Applicant, and where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations, and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the RCEC Application for Certification (AFC) (RCEC 2001), workshops, staff data requests and Calpine/Bechtel responses, site visits, project description clarifications and discussions with various state and federal agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

- Clean Water Act of 1977

  Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26).

- 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, prohibit the take of migratory birds.

STATE

- California Endangered Species Act of 1984

  Fish and Game Code sections 2050 et seq. protect 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 of any bird.

- Birds of Prey or Eggs-Take, Possess, or Destroy

  Fish and Game Code section 3503.3 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 non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

- Fully Protected Species

  Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit take of animals that are classified as Fully Protected in California.

- Significant Natural Areas

  Fish and Game Code section 1930 et seq. designate certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

- Native Plant Protection Act of 1977

  Fish and Game Code section 1900 et seq. designate 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.

- Clean Water Act

  To verify that the federal Clean Water Act permitted actions comply with state regulations, the RCEC will need to get a Section 401 certification from the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). The Regional Board provides its certification after reviewing the federal Nationwide Permit(s) that is provided by the U.S. Army Corp of Engineers (USACE).

LOCAL

- City of Hayward General Plan, Vegetation and Wildlife Habitats, General
  The planting of native vegetation should be encouraged, and whenever possible, vegetation removed during construction should be replaced. The City's remaining riparian plant communities should be protected and development should not encroach into important wildlife habitats. Documented habitats of unique, rare and/or endangered species of plants and wildlife should be protected, and application of toxic chemicals should be kept to a minimum.

- City of Hayward General Plan, Vegetation and Wildlife Habitats, Shoreline

  Existing salt marshes should be preserved and new marshes established. Tidal flats and salt ponds of low salinity should be preserved for migratory waterfowl. Saltwater evaporation ponds should be preserved or enhanced in a manner commensurate with continued salt production, and activities that could have adverse effects on marine fisheries should be avoided.

SETTING

REGIONAL

The proposed project is located in the upper portion of the San Leandro Valley near the east shore of San Francisco Bay. The city of Oakland lies to the north, the foothills of the Diablo Range to the east and the city of Fremont to the south. The proposed project region was historically dominated by coastal salt marsh habitat. The diverse coastal salt marsh community supports a wide range of organisms; however, urban and industrial development, salt evaporation ponds, and horticultural landscapes have replaced much of the original coastal marsh habitat. There are several wildlife habitat restoration projects in the area which are attempting to restore wetlands, but only remnants of the original coastal salt marsh now exist in the form of preserves and refuges.

LOCAL

The proposed RCEC will occupy approximately 14.7 acres in the Industrial Corridor of the City of Hayward, Alameda County, California. Radio transmission facilities for station KFAX and a sandblasting facility presently occupy the proposed RCEC site. It is bordered to the north by the city of Hayward Water Pollution Control Facility, to the south by an area of uplands, a stormwater channel and retention pond and to the east by various industrial facilities. On the western border is a trucking terminal beyond which lie a variety of seasonal, fresh and brackish water wetlands.

Although the proposed project site is within an area zoned for industrial use, significant biological resources areas lie to the west and southwest of the proposed project site. These include: Hayward Area Parks and Recreation District's (HARD) salt marsh restoration project and East Bay Regional Parks District's (EBRPD) Cogswell Marsh and Salt Marsh Harvest Mouse Preserve. Approximately 20 acres of privately owned upland habitat is located south and southwest of the proposed RCEC site. This property forms a buffer zone between wetlands and areas of industrial development. The stormwater channel located south of the proposed site is used for regulating the flow of freshwater into the Salt Marsh Harvest Mouse Preserve.

Habitat types within a one-mile radius around the proposed project site include: ruderal (weedy), horticultural, coastal salt marsh, brackish sloughs, emergent and brackish/freshwater marshes, annual grasslands and mud flats.

Annual grassland species found in the proposed project area are a mixture of grasses and herbaceous species. Non-native species include wild oat (*Avena fatua),* rip-gut

brome (*Bromus diandrus),* Bermuda grass (*Cynodon dactylon*), Italian rye grass (*Lolium multiflorum),* fennel (*Foeniculum vulgare),* black mustard (*Brassica nigra),* filaree (*Erodium cicutarium)* and bull mallow (*Malva nicaeensis).* Native species include three-week fescue (*Vulpia microstachys),* wild barley (*Hordeum leporinum),* coyote brush (*Baccharis pilularis),* wild pea (*Lathyrus* sp.) and California poppy (*Eschscholzia californica).*

Seasonal wetland vegetation on the proposed project footprint is dominated by salt grass (*Distichlis spicata),* alkali heath (*Frankenia salina),* curly dock (*Rumex crispus),* and spike rush (*Eleocharis* sp.). Pickleweed (*Salicornia virginica*), brass buttons (*Cotula coronopifolia*) and various ruderal (weedy) species dominate wetland vegetation at the stormwater retention pond.

Calpine/Bechtel provided information for a variety of sensitive species likely to occur in the project area including: alkali milk-vetch, Congdon's tarplant, hairless popcorn flower, western burrowing owl, salt marsh harvest mouse, salt marsh wandering shrew, black skimmer, California black rail, California clapper rail, California least tern, northern harrier, and western snowy plover. For a list of sensitive species evaluated by Calpine/Bechtel, see **Table 1** below.

Table 1. Sensitive Species evaluated by Calpine/Bechtel (2001c) for the RCEC project area.

Scientific Name	Common Name	Federal/State/CNPS *	Habitat in impact area?
Astragalus tener var. *tener*	alkali milk-vetch	SC/--/1B	Yes
Atriplex depressa	brittlescale	SC/--/1B	No
Balsamorhiza macrolepis var.*macrolepis*	big-scale balsamroot	--/--/1B	No
Cordylanthus maritimus ssp. *Palustris*	Point Reyes bird's-beak	SC/--/1B	Yes
Cordylanthus mollis ssp. *Hispidus*	hispid bird's-beak	SC/R/1B	Marginal
Fritillaria liliacea	fragrant fritillary	SC/--/1B	No
Helianthella castanea	Diablo rock rose	SC/--/1B	No
Hemizonia parryi ssp. *congdonii*	Congdon's tarplant	SC/--/1B	No
Horkelia cuneata ssp. *sericea*	Kellogg's horkelia	SC/--/1B	No
Lasthenia conjugens	Contra Costa goldfields	E/--/1B	No
Lathyrus jepsonii	Delta tule pea	SC/--/1B	Marginal
Lilaeopsis masonii	Mason's lilaeopsis	SC/R/1B	No
Plagiobothrys glaber	hairless popcorn flower	SC/--/1A	Yes
Suaeda californica	California seablite	PE/--/1B	Marginal
	Pacific western big-eared bat	SC/CSC	No

Corynorhinus townsendii Townsendii			
Eumops perotis californicus	Greater western mastiff-bat	SC/CSC	No
Myotis evotis	Long eared bat	SC/--	No
Myotis thysanodes	Fringed myotis bat	SC/--	No
Myotis volans	Long legged myotis bat	SC/--	No
Myotis yumanensis	Yuma myotis bat	SC/CSC	No
Neotoma fuscipes annectens	San Francisco dusky footed woodrat	SC/CSC	No
Reithrodontomys raviventris	Salt-marsh harvest mouse	E/E	Yes
Sorex vagrans halicoetes	Salt-marsh wandering shrew	SC/CSC	Yes
Accipeter striatus (nesting)	Sharp-shinned hawk	--/SSC	No
Agelaius tricolor (nesting Colony)	Tricolored blackbird	SC/CSC	No
Amphispiza belli belli	Bell's sage sparrow	SC/CSC	No
Aquila chrysaetos (nesting & wintering)	Golden eagle	--/SSC	
Ardea herodias (rookery)	Great blue heron	--/--	No
Asio flammeus (nesting)	Short-eared owl	--/SSC	No
Athene cunicularia hypuge (burrow sites)	Western burrowing owl	SC/CSC	Yes
Branta canadensis leucopareia	Aleutian Canada goose	T/--	No
Buteo regalis	Ferruginous hawk	SC/CSC	Winter foraging
Charadrius alexandrinus nivosus (nesting)	Western snowy plover	T/CSC	No
Circus cyaneus (nesting)	Northern harrier	--/CSC	Yes
Elanus leucurus (nesting)	White-tailed kite	--/--	Yes
Falco peregrinus anatum	American peregrine falcon	--/E	Yes-foraging
Geothlypis trichas sinuosa	Common yellowthroat	SC/CSC	No-foraging
Haliaeetus leucocephalus	Bald eagle	T/E	No
Laterallus jamaicensis coturniculus	California black rail	SC/T	No
Melospiza melodia pusillula	Alameda song sparrow	SC/CSC	Yes
Pelacanus occidentalis californica	California brown pelican	E/E	No
Phalacrocorax auritus	Double-crested cormorant	--/SSC	No
Rallus longirostris obsoletus	California clapper rail	E/E	No
Rynchops niger	Black skimmer	--/SSC	Yes
Riparia riparia (nesting)	Bank swallow	--/T	No
Sterna antillarum browni (nesting colony)	California least tern	E/E	No
Clemmys marmorata marmorata	Northwestern pond turtle	SC/CSC	Marginal
Clemmys marmorata pallida	Southwestern pond turtle	SC/CSC	Marginal
Masticophis lateralis euryxanthus	Alameda whipsnake	T/T	No
Phrynosoma coronatum frontale	California horned lizard	SC/CSC	No
	California tiger salamander	C/CSC	No

Ambystoma californiense			
Rana aurora draytonii	California red legged frog	T/CSC	No
Rana boylii	Foothill yellow legged frog	SC/CSC	
Hypomesus transpacificus	Delta smelt	T/T	No
Oncorhynchus kisutch	Coho salmon	T/E	No
Oncorhynchus mykiss	Central California Valley Steelhead	T/E	No
Oncorhynchus mykiss	Central California Valley Steelhead	T/E	No
Oncorhynchus tshawytscha	Winter run chinook salmon	E/E	No
Pogonichthys macrolepotus	Sacramento splittail	PT/CSC	No
Spririnchus thaleichthys	Longfin smelt	SC/CSC	No
Branchinecta lynchi	Vernal pool fairy shrimp	T/--	No
Danaus plexippus	Monarch butterfly	--/--	No
*Hydrochara ricksecker*i	Ricksecker's scavenger beetle	SC/--	Marginal
Tryonia imitator	Mimic tryonia (California brackishwater snail)	SC/--	Marginal

*** Status Categories**:
Codes used in the table are as follows:
E= Endangered; **T**= Threatened; **R**= California Rare; **PE**= Proposed Endangered **C**= Candidate: Taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened. **SC**= USFWS Species of Special Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking. **CSC**= CDFG "Species of Special Concern". CNPS (California Native Plant Society Inventory of Rare and Endangered Plants of California, 2001) List: **1A**= Presumed extinct in CA; **1B**= Rare or Endangered in CA and elsewhere.

ANALYSIS OF IMPACTS

Primary concerns associated with construction and operation of the proposed RCEC are the project's potential impacts to habitat and the following sensitive species:

- Salt marsh harvest mouse, federally and state listed endangered.
- California clapper rail, federally and state listed endangered.
- California least tern, federally and state listed endangered.
- Western snowy plover, federally listed threatened and state Species of Special Concern.

Applicant has proposed measures to mitigate potentially significant impacts to listed species and wildlife habitat. Staff, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), U.S. Army Corp of Engineers (USACE), U.S. Environmental Protection Agency (EPA) and the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) reviewed the proposals and agree that measures proposed by Applicant (Calpine/Bechtel 2002) should mitigate potentially adverse impacts to levels less than significant. To address potential adverse impacts to wetlands and habitat, applicant has proposed a Wetland Mitigation Plan (Calpine 2002a). While preliminary approval for the conceptual plan was expressed by all concerned regulatory agencies, a final Wetland Mitigation Plan will still need approval by staff, USFWS, SFRWQCB and USACE. Staff's approval of the final plan will be in the form of a letter to Applicant. Approval of the final plan will be in the form of a Biological Opinion from USFWS and 401 and 404 permits from the SFRWQCB and USACE respectively.

ENVIRONMENTAL CHECKLIST	Potentially Significant Input	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
BIOLOGICAL RESOURCES – Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
*c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X	X	
*d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

***c1** – impacts to surrounding wetlands, **c2** –effluent discharge, **c3** – wetlands fill, **d1** – noise, **d2** - habitat loss, **d3** – bird collision and electrocution, **d4** - Solids facility, gas and water lines, transmission line route, laydown areas

DISCUSSION OF IMPACTS

A) -Impacts to Listed or Sensitive Species

Construction and operation of the RCEC could adversely affect the salt marsh harvest mouse, California clapper rail, California least tern, and western snowy plover. The proposed architectural screening treatment and changes to the existing landscape could provide additional nest, perch and roost sites for avian predators (e.g. red-tail hawk, crows, ravens) of sensitive species currently found in the proposed project area. To address these concerns Applicant has proposed the following mitigation measures (RCEC 2002):

proposed project area. To address these concerns Applicant has proposed the following mitigation measures (RCEC 2002):

- All potential raptor perches on project infrastructure will be fitted with NIXALITE® or similar perch deterrent device, a perch deterrent monitoring program will be implemented and an adaptive management plan will be developed concurrent with perch deterrent monitoring;
- Landscaping at the project site will be limited to trees that discourage raptor perching. Tree species will be selected from a list provided by the USFWS; and
- All new towers associated with the transmission line will be of non-lattice, single-pole construction;

It is staff's opinion that installation of perch deterrent devices on project infrastucture, and planting trees that are not capable of supporting perching raptors/corvids, should help reduce the number of potentially available perch sites provided by the proposed project. Staff concludes that deterrent devices, use of tree species recommended by the USFWS, perch deterrent monitoring and an adaptive management plan should reduce potential predation of sensitive species by raptors/corvids to levels less than significant. However, to complete formal consultation between the USEPA and the USFWS, and obtain a Biological Opinion from USFWS, Applicant will need to submit, to USFWS, a complete project description, including the final predator perch deterrent and monitoring plan. After the document is reviewed and approved, formal consultation can be completed and a Biological Opinion can be issued by the USFWS. For more information, see Biological Resources Conditions of Certification **BIO- 6** and **BIO- 14.**

B) –Riparian habitats:

Staff does not anticipate any adverse impacts to riparian habitats associated with the proposed project.

C1) -Impacts to Surrounding Wetlands

Staff, USFWS, CDFG, SFRWQCB, HARD and EBRPD have all expressed concerns about the project's potential impacts to adjacent sensitive areas due to its stormwater runoff. Of particular concern are EBRPD's freshwater marsh and the adjacent Salt Marsh Harvest Mouse Preserve, which are hydrologically connected to the Alameda County Flood Control Channel.

Applicant is currently preparing a Storm Water Management Plan (Crea 2002). As part of their proposed plan, water discharge following storm events will be coordinated with the management of the HARD Marsh and the Salt Marsh Harvest Mouse Preserve to ensure discharge does not occur when salt water is being introduced into the marshes (Calpine/Bechtel 2001).

Staff concludes that implementation of the Stormwater Management Plan, as approved by all concerned agencies, will reduce potential wetland impacts to levels less than significant. For more information, see Biological Resources

Condition of Certification **BIO-9** and Soil and Water Resources Condition of Certification **Soil & Water-3**.

C.2) - Impacts to San Francisco Bay:

The proposed project has the potential to affect shallow water habitat in San Francisco Bay. The project will share an existing effluent discharge pipe with the City of Hayward Water Pollution Control Facility (WPCF). The effluent from this pipe is discharged through the East Bay Dischargers Authority (EBDA) pipeline to the EBDA outfall in San Francisco Bay. The EBDA pipeline is shared by a number of users including the cities of Hayward, Fremont, Union City, Newark, San Leandro and Livermore.

Applicant has indicated that, at peak conditions, the proposed project will use 5.27 million gallons per day (mgd) of secondary effluent obtained from the WPCF. The secondary effluent will be treated at the RCEC Advanced Wastewater Treatment Plant (AWT) so that tertiary effluent (water) may be used for cooling and process water. At peak levels, the RCEC will return 0.07 mgd of cooling wastewater and 1.47 mgd of wastewater from the AWT to the WPCF. A net reduction in the volume of liquid effluent discharged from the WPCF is expected (13.3 mgd to 9.5 mgd) due to losses at the RCEC from cooling tower evaporation.

The temperature of the cooling tower wastewater when it leaves the RCEC is projected to be between 85 and 100 degrees Fahrenheit (Calpine/Bechtel 2001b). AWT wastewater is not used in the cooling process and is not discharged at elevated temperatures. The cooling tower wastewater from the RCEC (0.07 mgd) will combine with AWT wastewater and large volumes of existing effluent from the WPCF and EBDA pipeline before discharge at the EBDA outfall approximately 12 miles from the RCEC. The dilution of RCEC wastewater with existing effluent and the distance traversed before discharge will provide sufficient cooling before discharge to the bay.

Staff concludes that wastewater from the proposed RCEC will have a less than significant impact on the water quality of shallow water habitats in the vicinity of the effluent outfall.

C.3) - Fill of Jurisdictional Wetlands:

The proposed project would fill approximately 1.7 acres of jurisdictional wetlands. To mitigate the fill of 1.7 acres of seasonal freshwater wetlands, Applicant has proposed a Wetland Mitigation Plan (the plan) that includes creation, preservation and enhancement components (Calpine 2002a). In preparing the plan, Applicant considered requirements of various agencies permitting the proposed project and the long-term, sensitive species management goals of HARD and EBRPD.

Central to the proposed plan is the purchase of approximately 26 acres of wetland and upland habitat (the parcel). The parcel has also been proposed to mitigate permanent and temporary habitat losses also associated with the project (see checklist section **d2) Permanent and Temporary Habitat Loss**, below). The

parcel is located between the proposed project site and managed wetlands, including salt-marsh harvest mouse habitat owned by the City of Hayward. The parcel, which is immediately adjacent to the southwest border of the proposed project, is an important part of the local wetland ecosystem and is directly and indirectly connected to a variety of former salt ponds and wetlands along the Hayward Shoreline. The local wetland ecosystem is intensely managed for sensitive species.

The no-net-loss of wetlands policy, enforced by the SFRWQCB and USACE, required that Applicant create replacement wetlands to mitigate wetland fill associated with the proposed project. To comply with the no-net-loss policy, Applicant proposed creation of approximately 1.05 acres of freshwater wetlands and approximately 0.72 acres of salt-water wetlands. Typically, the USACE, SFRWQCB, staff, USFWS and CDFG prefer that creation of wetlands for mitigation purposes be in-kind (freshwater wetland creation for freshwater wetland impacts). Furthermore, creation of approximately 1.8 acres (1.05 fresh + 0.72 salt) of wetlands would normally be considered insufficient compensation for fill of 1.7 acres of wetlands. However, because of the proposed parcel's location, and proposed preservation and enhancement components in the plan, agency consensus is that the proposed plan would help preserve and enhance the local wetland ecosystem for the benefit of wildlife, particularly sensitive species. Therefore, Applicant's proposal to create approximately 1.8 acres of wetlands (not, in-kind replacement) was considered adequate mitigation for fill of freshwater wetlands on the proposed project site. The basic components of the plan are:

- Enhance tidal action;
- Create fresh and salt water wetlands;
- Enhance upland habitats; and
- Preserve wetland and upland habitats.

For descriptive purposes, Applicant has divided the parcel into Areas 1, 2 and 3 (see Calpine Wetland Mitigation Plan Figure 2-2 (Calpine 2002)). To support the plan's feasibility, Applicant has conducted a hydrological modeling analysis, the results of which have been included in the Wetland Mitigation Plan (Calpine 2002). Staff, USACE, CDFG, USFWS, SFRWQCB and USEPA have reviewed the plan and agree with its overall concept. While overall strategy is generally supported by results of Applicant's modeling analysis, actual modeling analysis and specific construction details have not yet been submitted.

F-9

For a summary of Applicant's proposed creation, preservation and enhancement acreages, see **Table 2** below.

Table 2.

LOCATION *	CREATION	PRESERVATION	ENHANCEMENT
Johnson Road Levee, Area 1.	Reduce height and width of levee=0.75 acre freshwater wetland.		
Area 1	Remove fill =0.3 acres freshwater wetland.	Freshwater wetland = 4.1 acres.	
Areas 1 and 2		Uplands = 5.0 acres. (preserve and enhance)	Uplands = 5.0 acres. (preserve and enhance)
Area 2		Freshwater wetland = 7.7 acres.	
Area 3	Remove levee on south side of storm water canal = 0.72 acre salt marsh.	Salt marsh = 6.2 acres.	
Johnson Road Levee, Area 3.			Dredge borrow channel on west side of levee to enhance tidal action.
Area 3, City of Hayward Property, Salt Marsh Harvest Mouse Preserve, HARD Marsh.			Dredge interior channels to enhance tidal action.
	Total freshwater = 1.05 acres.	Total freshwater = 11.8 acres.	
	Total salt marsh =.72 acre.	Total salt marsh = 6.2 acres.	
		Total uplands = 5.0	
	Total creation = 1.77 acres.	**Total preservation = 23.0 acres.**	**Enhance tidal action to approximately 36.0 acres of salt marsh.**

* See Calpine Wetland Mitigation Plan Figures 2-2 and 3-1 (Calpine 2002).

Applicant has proposed creation of approximately 1.8 acres of fresh and salt water wetlands. Acreage proposed for creation may appear low when compared to the potential impact (1.7 acres) and when compared to mitigation required for like impacts caused by other bay area projects (Lichten 2002). However, it is the opinion of staff, and other concerned agencies, that the proposed plan would allow for management of the parcel as an integral part of the local wetland ecosystem. The habitat extant on the parcel, combined with the preservation and enhancement components in the plan, would preserve some characteristics of the original coastal salt marsh ecosystem and would assist HARD and the EBRPD in their efforts to manage sensitive species habitat. Staff concludes that the proposed plan would reduce the potential impacts to jurisdictional wetlands to levels less than significant.

Because some construction activities associated with the plan will occur in sensitive species habitat, a Biological Opinion from the USFWS will be required. Before the Biological Opinion can be issued, formal consultation between the EPA and the USFWS will need to be completed. To complete formal consultation, Applicant must submit a complete project description, including the final Wetland Mitigation Plan, to the USFWS. In addition, because the proposed RCEC will fill jurisdictional wetlands, a USACE Section 404 permit and SFRWQCB 401 Certification must also be obtained. However, before these permits can be obtained, Applicant needs to provide detailed construction information and the

hydrological modeling analysis. For more information, see Biological Resources Conditions of Certification **BIO- 6**, **BIO- 8,** and **BIO- 10**.

D.1) -Construction and Operational Noise:

Staff is concerned that construction impacts, particularly noise, could directly impact sensitive species breeding areas and wildlife using the surrounding areas. The USFWS has also raised this concern. Applicant estimates noise levels from pile-driving and steam blow activities will range from 106 decibels (dBA) @ 50 feet to 65 dBA @ 1.02 miles (Calpine/Bechtel 2001). Sensitive nesting species within a one-mile radius of the proposed project site could be exposed to noise levels above 60 dBA. A general rule for estimating noise levels at increasing distances is to decrease the noise level by 6 dBA as the distance is doubled (Birdsell 2001). Applying this to the pile-driving and steam blow activities provides estimated noise levels of 100 dBA @ 100 feet, 76 dBA @ 1,600 feet (> ¼ mile) and 70 dBA @ 3,200 feet (> ½ mile) respectively.

Numerous waterfowl and shorebird species inhabit the proposed project region, and some studies indicate ducks, geese, long distance migrants and colonial nesting birds are particularly susceptible to noise disturbances (Burger 1981; Markham and Brechtel 1979). RECON (1989) concluded that noise levels above 60 dBA affected the territorial behavior of a state and federally listed bird species not known from the RCEC project region. A report on noise criteria for the protection of endangered perching birds concluded that the 60 dBA criterion derived from the RECON (1989) study, while not suitable for all species and situations, did come from the available scientific data and was a reasonable departure point (TNCC 1997). The 60 dBA criterion has been used by the USFWS as a reference point for evaluating noise impacts to wildlife (Buford 2001).

Noise disturbances from construction activities during the mating and nesting season may have an adverse effect on formation of pair bonds and/or reproductive success of sensitive species in the project area; furthermore, construction related disturbances could discourage habitat use by wildlife. Information obtained from the EBRPD documents the presence of several breeding/nesting species under federal/state protection within a one-mile radius of the project footprint (Taylor 2001). These include: federally and state endangered -salt marsh harvest mouse, federally threatened, state species of concern-Western snowy plover, federally and state endangered-California clapper rail, state species of concern, black skimmer and the state and federally endangered-California least tern. Joe Didonato, Wildlife Program Manager for the East Bay Regional Parks District, indicated the presence of snowy egret (*Egretta thula*) and black-crowned night heron (*Nycticorax nycticorax*) rookeries within one-quarter mile of the proposed project site (Didonato 2001). These rookeries are listed as sensitive by CDFG.

Indirect Impacts

Applicant has indicated that operational noise levels of the RCEC are expected to be approximately 69 dBA at the perimeters of the proposed project footprint (Calpine and Bechtel 2001c). Operational noise levels of the proposed project could indirectly impact upland habitat adjacent to the proposed RCEC site. This

upland area is an important buffer zone between wetlands and areas of industrial development. Operational noise expected from a 24 hour/day, 7 day/week operations schedule would exist for the life of the proposed power plant. Power plant operational noise could increase background noise levels in open-space areas adjacent to the proposed project. Increases in background noise (masking) could interfere with the ability of wildlife to detect predators (Awbrey et. al. 1995, Awbrey 1993, Miline et. al. 1969, Riley and Rosenzweig 1957).

To mitigate impacts associated with construction and operational noise, Applicant has proposed the following mitigation measures (RCEC 2002):

- Pile driving noise: Use of a padded enclosure around the pile, or use of padding on the driver head during the breeding season for sensitive species in the proposed project area (March-September);
- Steam blow noise: Use of low pressure continuous blow; and
- Operational noise: Funding for a predator management program.

Information provided by Applicant indicates that use of an enclosure dampening method would reduce pile-driving noise to 70 dBA or less at a distance of approximately 262 feet (80 meters). The padding method would reduce pile-driving noise to 73 dBA or less at a distance of approximately 262 feet (RCEC 2002). Pile-driving noise levels of 70 dBA at 262 feet (80 meters) or 73 dBA at 262 feet (80 meters) would result in noise levels of 58 dBA and 61 dBA at 1,048 feet respectively.

To mitigate steam blow noise, Applicant has proposed use of low-pressure steam blow. Staff will allow high-pressure steam blow only if high-pressure steam blow noise does not exceed 86 dBA at a distance of 50 feet, see condition **NOISE-4**. Steam blow noise levels of 86 dBA at 50 feet would result in steam blow noise levels of approximately 62 dBA at 800 feet. The proposed mitigation measures would result in pile driving and steam blow noise levels below 60 dBA at the closest breeding habitat for sensitive species (approximately one-quarter mile (1,320 feet) from the proposed project footprint).

Operational noise was projected as 69 dBA at the perimeters of the proposed project. Staff was particularly concerned with potentially adverse operational noise impacts to the upland area adjacent to the southwest border of the proposed project site. Because this upland area is considered salt-marsh harvest mouse refugia, staff was concerned that noise from proposed project operation would increase background noise levels, making it more difficult for the salt-marsh harvest mouse, and other wildlife, to detect predators.

In response to staff's request for additional information concerning ambient and projected operational noise near the southwestern corner of the proposed RCEC site, Applicant monitored noise levels near this location over a 25-hour period from January 28 to January 29, 2002. Monitoring was conducted at a site approximately 100 yards south of the southwestern border of the proposed project site. Information provided by Applicant indicated that the ambient noise level

approximately 100 meters south of the proposed RCEC boundary was 55.3 dBA. Based on this information, Applicant projected operational noise at the southwest boundary of the proposed site as 60.5 DBA (Calpine/Bechtel 2002). Staff does not anticipate any adverse operational noise impacts to wildlife at the projected level.

It is staff's opinion that Applicant's proposals to mitigate pile driving and steam blow noise will reduce potential impacts to sensitive breeding species in the proposed project area to levels less than significant. Although staff does not anticipate adverse impacts to wildlife from operational noise, implementation of a predator management program to protect wildlife in upland areas adjacent to the proposed project site was discussed. EBRPD has indicated that the endowment to be provided for habitat management is sufficiently large to fund a predator management program (Didonato 2002). Staff concludes that mitigation measures proposed by Applicant will mitigate potential construction and operational noise impacts to levels less than significant. For more information, see Conditions of Certification **BIO-12** and **NOISE-4**.

D.2) - Permanent and Temporary Habitat Loss:

Applicant conducted sensitive species surveys for the proposed project site and for a one-mile radius around it. Applicant indicated no sensitive species were observed during these surveys, but the proposed power plant site is utilized by a variety of wildlife, and nearby open-space areas are used by a variety of sensitive nesting species (Itoga 2001, Taylor 2001, Didonato 2001).

Although the proposed plant site is zoned industrial, current use (radio tower transmission facility) leaves most of it as open-space. Construction of the proposed RCEC will displace wildlife species from the wetland and grassland habitats on the project site. In addition, construction of the proposed project will eliminate habitat available to species in nearby wetland areas. Kantrud and Stewart (1984) and Cowardin (1969) found that some wetland species require a combination of wetland and other land cover types. Daily movement between pickleweed and grasslands often are exhibited by the state and federally listed endangered salt-marsh harvest mouse (CDFG 1990). Many wildlife species are known to move between different habitat types in sustaining their daily energy budgets.

The proposed power plant will occupy approximately 14.7 acres. Construction of the proposed RCEC will result in the permanent loss of approximately 9.4 acres of annual grassland and approximately 1.7 acres of jurisdictional wetlands.

Applicant indicated that expansion of PG&E's East Shore Substation will be needed to accommodate the input from the proposed RCEC (Calpine/Bechtel 2001) and that acquisition of approximately two acres of PG&E land will also be required (Calpine/ Bechtel 2001b). The land proposed for substation expansion supports ruderal vegetation and is currently undeveloped, but is capable of supporting burrowing owls. Burrowing owl sitings have been reported less than 750 feet south of the proposed substation expansion area (Taylor 2002).

In addition to permanent habitat loss, Calpine/Bechtel has proposed a 10-acre construction laydown/worker parking area to be located on open land south of PG&E's East Shore Substation (Calpine/Bechtel 2001b). Use of this area for worker parking and construction laydown will cause a temporary disturbance to the proposed area. As with the substation expansion, staff considers the open land around the substation as burrowing owl habitat.

To compensate for the permanent loss of 9.4 acres of annual grassland, 1.7 acres of seasonal freshwater wetlands, 2 acres of ruderal vegetation and the temporary loss of 10 acres of ruderal habitat, Applicant has proposed:

- The purchase of 26.19 acres of upland, seasonal freshwater wetland, and salt marsh habitat adjacent to the proposed RCEC site;
- Donation of the 26.19 acres of habitat to EBRPD;
- Assistance in negotiating a minimal cost, long-term lease with the City of Hayward for 30 acres of wetlands located between the parcel and the Salt Marsh Harvest Mouse Preserve;
- An endowment to be provided to EBRPD for managing the compensation parcel in perpetuity.

It is staff's opinion that the proposed parcel will contribute to preserving and enhancing the coastal salt-marsh ecosystem in the proposed project area. In addition, Applicant's proposals for creation and enhancement on the parcel would benefit the long-term management goals of HARD and EBRPD (see checklist section **c3) Fill of Jurisdictional Wetlands** above). Staff concludes that Applicant's proposed habitat compensation would reduce adverse temporary and permanent habitat losses associated with construction and operation of the proposed RCEC to levels less than significant. However, Applicant will need to obtain a Biological Opinion from the USFWS. For more information, see Biological Resources Conditions of Certification **BIO- 6** and **BIO- 10**.

D.3) -Collision and Electrocution:

The close proximity of the proposed project to sensitive biological resource/open-space areas combined with diverse communities of avian species create the potential for direct impacts to birds through electrocution or collisions with transmission lines/towers, architectural screening, cooling towers and boiler and exhaust stacks. During storms, birds may be attracted to the power plant by artificial night lighting thereby increasing the risk of collisions with various power plant facilities.

Birds can be electrocuted when they simultaneously contact two conductors of different phases or contact a conductor and a ground. Bird electrocutions are commonly associated with distribution lines, not transmission lines, due to closer spacing of conductors and grounds (APLIC 1996). Staff anticipates that the proposed RCEC transmission line towers and conductors will be constructed to federal standards (PUC 1981 - General Order 95). These standards require minimum distances between conductors, and therefore make it highly unlikely that

even very large birds (hawks, eagles, etc.) are likely to contact different phases or contact a conductor and a ground. Staff concludes that the proposed RCEC transmission lines will not pose a significant electrocution hazard to birds in the project area.

Avian collisions with architectural screening, boiler stacks, cooling towers and turbine stacks are possible; however, Calpine/Bechtel has indicated that the tallest stack proposed for the RCEC heat recovery steam generator (HRSG) will not exceed 145 feet in height. The architectural screening surrounding the HRSG units and stacks will be approximately 135 feet tall. The cooling tower stacks and associated screening have a projected height of 64 feet. These structures are considered relatively short and of low risk for bird collisions, as most documented bird collision deaths are associated with facilities ranging from 500 to 650 feet high (Goodwin 1975, Maehr et al. 1983, Weir 1974, Zimmerman 1975). Additionally, lighting will be shielded to direct light downward, reducing the risk of bird attraction. See Visual Resources Assessment, Condition of Certification **VIS-5**. For these reasons, staff does not anticipate significant impacts to birds from collisions with stacks or architectural screening.

D.3) -Collisions:

Collisions with transmission lines have also been documented as a source of bird mortality. Commonly associated with migratory birds, collisions are likely to occur during periods of darkness or inclement weather, and usually occur when birds impact overhead ground wires. In consultation with EBRPD, USFWS and CEC staff has determined that because of the large numbers of migratory birds in the proposed project area, the overhead ground wire(s) associated with the project could pose a significant collision hazard.

To minimize the potential for bird collisions with ground wires, Calpine/Bechtel has proposed the use of bird flight deterrents, such as streamers (Calpine/Bechtel 2001).

Staff concludes that the proposed transmission line will pose a significant collision hazard to birds in the area; however, the installation of bird flight diverters on transmission line overhead ground wires should reduce the risk of collision to levels less than significant. Because of their large size (presumed higher visibility) and longevity, staff recommends the use of swan flight diverters. For more information, see Biological Resources Condition of Certification **BIO-13**.

D.4) -Solids handling facility, laydown areas and linears:

Applicant has proposed a relocation plan to move a portion of the RCEC AWT across Enterprise Avenue to the WPCF. The proposed relocation will occupy 1.4 acres within the WPCF fence line. Currently, the proposed relocation site is used for drying and storing sludge created in the water treatment process. The proposed area is bordered on the north by auto salvage yards and to the west by sewage ponds. Movement of sludge for drying and storage is done by heavy machinery leaving the area highly disturbed. Foster Wheeler staff conducted a sensitive species survey of the proposed site on September 5, 2001, and

concluded the proposed site did not contain suitable sensitive species habitat (Calpine/Bechtel 2001b). Staff agrees with the assessment and concludes that relocation of the solids handling facility to the proposed WPCF site will not impact biological resources in the area.

In addition to the 10-acre construction laydown and worker parking area adjacent to PG&E's Eastshore Substation, Applicant has proposed four additional construction laydown and parking areas have been proposed (Calpine/Bechtel 2002). Site one consists of a 4.0-acre site is located at the corner of Whitesell Road and Enterprise Avenue. Its current use is for truck parking and vehicle parts storage. Site two is 3.3 acres located at 3458 Enterprise Avenue. One-half of the site is currently used for storage while the remaining one-half is unused. Site three is located at 3440 Enterprise Avenue. The parcel is currently unused. The fourth proposed site consists of two combined parcels located at 3643 and 3639 Depot Road. The two sites total 3.7 acres and are currently used for truck washing. These proposed laydown areas consist of paved/graveled areas with only sparse ruderal vegetation. Considering the disturbed nature and current levels of industrial activity already affecting these proposed areas, staff concludes that there will be no adverse impacts to biological resources from the use of these areas for construction laydown and worker parking.

Applicant has proposed approximately 0.9 miles of new pipeline to supply the RCEC with natural gas from an existing PG&E line. The proposed RCEC line will be routed beneath paved roadways, a graveled portion of a Berkeley Farms processing plant and a set of Union Pacific Railroad (UPRR) tracks. The proposed pipeline will be connected to the PG&E pipeline located west of the UPRR tracks. Because of the existing urban development and disturbance along the proposed route, staff anticipates no impacts to biological resources from construction of the natural gas pipeline.

To connect the RCEC to PG&E's Eastshore Substation, an overhead transmission line has been proposed. Applicant has proposed 600 feet of new line from the RCEC switchyard to the existing East Bay-Grant 115-kV transmission line corridor, approximately 1.1 miles of new 230-kV overhead line and seven additional towers. The tie-in from the East Bay-Grant Corridor lines to the Eastshore Substation will require approximately 500 feet of additional transmission line (Calpine/Bechtel 2001).

Applicant originally indicated five new towers would replace existing towers in the East Bay Grant 115-kV corridor. It has now been proposed that the new line will be constructed parallel to the existing one (Calpine/Bechtel 2001b). The parallel lines will be spaced 80 feet apart. Applicant has indicated that seven tubular, not lattice, towers will be constructed (Calpine/Bechtel 2001b). Staff believes that tubular towers are more desirable than lattice towers since tubular towers provide minimal perch opportunities for birds and pose less of a collision threat.

The proposed RCEC transmission line will traverse areas of commercial and industrial development. Applicant has indicated that five of the proposed tower locations are covered with asphalt. The sixth will be located within the State Route

92 on-ramp loop. Applicant has indicated that the ground within this loop is covered with sand, piles of dirt and asphalt fill. The seventh tower will be located north of Enterprise Avenue near the proposed RCEC site (Calpine/Bechtel 2001b). Sensitive species surveys done by Applicant for the originally proposed transmission line were conducted for 1000 feet on each side of the existing line (Calpine/Bechtel 2001). Staff has reviewed the proposed tower locations and concludes that because the proposed route will traverse disturbed areas and will be located within the existing transmission line corridor, the original transmission line surveys conducted by Applicant are sufficient to address potential impacts caused by construction of the newly proposed transmission line, and staff anticipates no impacts to biological resources along the proposed route.

Applicant has proposed the construction of the RCEC Advanced Wastewater Treatment Plant (AWT) for treatment of secondary effluent obtained from the City of Hayward Water Pollution Control Facility (WPCF). Enterprise Avenue separates the proposed RCEC and the WPCF. The AWT will process secondary effluent delivered from the WPCF before use as cooling and process water. After cycling through the cooling process, the water will be returned to the wastewater treatment plant. Applicant has indicated that all pipelines proposed for inflow and outflow of industrial and potable water will be routed underground. Inflow and outflow pipelines connecting the WPCF and the proposed RCEC will be routed beneath Enterprise Avenue. Applicant has proposed a connecting pipeline from the East Bay Dischargers Authority pipeline to the AWT. This connecting pipeline will also be routed underground beneath Enterprise Avenue and the WPCF site. Because the pipelines will be routed beneath disturbed/developed areas, staff does not anticipate any adverse biological resource impacts due to construction of water supply pipelines.

E) - Local policies or ordinances:

Staff does not anticipate any conflicts with local policies or ordinances.

F) - Habitat conservation plans:

HARD has filed a local plan identified as the Hayward Shoreline Enhancement Plan. HARD staff reviewed the proposed RCEC project and indicated the proposed RCEC will not conflict with the Hayward Shoreline Enhancement Plan (Willyerd 2001). Staff concludes that the proposed RCEC will not conflict with the Hayward Shoreline Enhancement Plan or other approved local, regional, or state habitat conservation plans.

CUMULATIVE IMPACTS

Cumulative impacts associated with the proposed RCEC are habitat loss, wetland fill and noise. Construction and operation of the proposed project would add a new source of noise to the proposed project area, fill freshwater wetlands and cause the permanent loss of annual grasslands.

Historically, the proposed project region was predominantly coastal salt marsh habitat. Coastal salt marsh ecosytems consist of a variety of habitat types including seasonal-freshwater wetlands, uplands, mudflats, brackish sloughs and salt water wetlands.

These different habitat types are necessary to support a functional and diverse coastal salt marsh community. Over the past 10 years, population in the San Francisco Bay Area has increased, and continues to do so (Itoga, personal observation). The population of Alameda County alone is expected to increase 10% by the year 2010 (ABAG 2002). Residential and industrial development projects in the San Francisco Bay Area have contributed to the loss of coastal salt marshes, including wetland and annual grassland habitat. In Alameda County, over 2.5 million square feet of open-space are currently being developed (BAMP 2002). Residential and industrial development projects in the Bay area are ongoing. The proposed RCEC would contribute to the loss of open-space, including wetland and grassland habitats, in Alameda County and the San Francisco Bay Area.

The proposed project is close to the Hayward Shoreline on the border of an industrial area. Significant noise sources in the area are the WPCF, Oakland International Airport and State Route 92. With increasing bay area populations, air traffic at the nearby Oakland International Airport would also increase and a proposed widening of State Route 92 would increase the volume of vehicular traffic (Copeland 2002). Noise from the airport and State Route 92 would increase proportionally with population increases. Noise from the proposed RCEC would add an additional noise source to the proposed project area.

Staff concludes that the incremental effects, on wetlands, annual grasslands and noise, associated with construction and operation of the proposed RCEC would, when considered together with like impacts from other reasonably foreseeable future projects in the proposed area, contribute significantly to habitat loss, wetland fill and noise.

COMPLIANCE WITH LORS

The proposed project would fill jurisdictional wetlands and could adversely impact sensitive species and habitats. Applicant has proposed mitigation measures that would reduce potential impacts to levels less than significant. However, for the proposed project to be in compliance with federal and state Clean Water Acts, Applicant will need to apply for, and procure, a USACE Section 404 permit and a SFRWQCB Section 401 Certification. To be in compliance with the federal Endangered Species Act, Calpine/Bechtel will need a Biological Opinion from the USFWS.

FACILITY CLOSURE

Sometime in the future, the RCEC 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.

The restoration of annual grassland and seasonal wetland habitats on the proposed project footprint will need to be addressed in any discussion of facility closure. Habitat

restoration plans should 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.

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the RCEC. 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. For more information, see Biological Resources Condition of Certification **BIO-11**.

RESPONSES TO PUBLIC AND AGENCY COMMENTS

AGENCY COMMENTS

U.S. Fish and Wildlife Service

USFWS (8-27)-1: *Landscaping and infrastructure will provide roosting and perching locations for avian predators of the salt marsh harvest mouse, California clapper rail, California least tern, and western snowy plover and an increase in power lines may contribute to an increase in bird collisions with the power lines.*

Staff response: In consultation with USFWS and the CEC, Applicant has developed a landscape plan to deter the perching, nesting/roosting of avian predators that are known to prey upon local sensitive species. A monitoring plan will also be implemented to determine if the perch deterrents are effective. If the monitoring plan indicates that perch deterrents are not effective, Applicant will consult with the CEC, USFWS and CDFG to determine the appropriate course of action. With respect to power lines and bird collisions, tubular steel towers will be used for all transmission line towers associated with the RCEC. Tubular towers greatly reduce perch opportunities. Regarding bird collisions with power lines, Applicant has proposed the use of bird flight diverters on overhead ground wires.

USFWS (8-27)-2: *Effluent discharge and storage may result in alteration of existing habitat through added freshwater in a salt marsh, which may result in an alteration of available prey for the California clapper rail, California least tern and western snowy plover.*

Staff response: Effluent discharge from the proposed RCEC will not adversely affect the local salt marsh or shallow water habitats in San Francisco Bay. The proposed RCEC will obtain approximately 5.27 million gallons/day of secondary effluent from the City of Hayward Water Pollution Control Facility (WPCF). This water will then be treated at the RCEC Advanced Wastewater Treatment Plant to tertiary effluent for use as cooling and process water. After the tertiary effluent has been used as cooling and process water, approximately 1.48 mgd will be returned to the WWTP where it will be mixed with existing secondary effluent before being discharged to the bay. The overall effect of the RCEC wastewater to the EBDA discharge would be a 3.7 mgd reduction in the volume of liquid effluent discharged to the bay.

USFWS (8-27)-3: *The Applicant stated they would investigate conservation actions such as purchasing fee title or a conservation easement of local salt marsh, tidal flats or adjacent uplands to provide compensation for long-term impacts to species and resources.*

Staff response: Applicant has proposed a Wetland Mitigation Plan that includes purchase and donation of habitat to East Bay Regional Parks District. Also proposed was an endowment to manage the habitat in perpetuity.

East Bay Regional Parks District

EBRPD (8-20)-1: *The project information states that "temporary fencing" will be provided to ensure that entry into the sensitive salt marsh areas is avoided. The project does not adequately discuss or provide mitigation for the potential loss of sensitive habitat.*

Staff response: Calpine/Bechtel has proposed a donation of 26.19 acres of habitat to the EBRPD. Also included in the proposal is an endowment fund allowing EBRPD to manage the habitat in perpetuity.

EBRPD (8-20)-2: *The project information fails to adequately address potential impacts to the District's Salt Marsh Harvest Mouse Preserve. The preserve is contiguous with similar habitat owned by the City of Hayward. Runoff from the project during rain events, emergencies, and normal routine may carry toxic substances into these lands and be distributed throughout the preserve. Additionally, the hydraulic dynamics of the preserve are linked with the District's operation of the freshwater marsh. Draining the preserve is dependent on the management of the freshwater marsh and it can take several days to drain water to reduce the impacts to the preserve.*

Staff response: To avoid negative impacts to the surrounding wetland habitats, Calpine/Bechtel has agreed to work with personnel from HARD, EBRPD, City of Hayward Public Works Department, Alameda Flood Control District and the SFRWQCB in developing a storm water management plan. Staff will require that this plan be completed prior to the start of project construction.

EBRPD (8-20)-3: *New available perches can increase predation or harassment of sensitive species by perching birds. The project information fails to identify the type of devices and document their level of success in reducing perching birds.*

Staff response: Applicant has developed a landscape plan in consultation with USFWS, CDFG and staff. This plan includes all methods to be used to deter perching, nesting/roosting of avian predators that could prey on sensitive species in the area. A monitoring plan has also been developed to assess the effectiveness of perch deterrents. Should monitoring indicate that the perch deterrents are ineffective, the project owner shall consult with CEC, USFWS and CDFG to determine an appropriate course of action.

EBRPD (8-20)-4: *Many of the potentially impacted plants would not be identifiable until December, rather than in February, March and April times identified. Scientific surveys*

need to be taken at the appropriate time of year to determine the extent of potentially significant impacts to many of the special status plant species.

Staff response: Upon reviewing the sensitive plants survey information submitted by the Applicant, staff concludes that suitable sensitive plant habitat does not exist at the project site or along the transmission line corridor. Further, survey protocols used by the Applicant were appropriate and conducted over sufficient time to detect the presence of sensitive plant species in the area.

City of Hayward

CITY (7-27)-1: *Show how structures will be designed to prevent raptors from perching on structures where they could otherwise easily prey upon nearby protected species.*

Staff response: *Applicant, in consultation with the USFWS, CDFG and EBRPD, has proposed a perch deterrent strategy to prevent raptors/corvids from perching. In addition, to assess the effectiveness of the devices a monitoring plan has also been proposed. If the plans are not successful, the project owner shall consult with the CEC, USFWS and CDFG to determine the appropriate course of action.*

PUBLIC COMMENTS

Audrey Lepell, letter dated August 21, 2001:

Will the screened building, towers and other structures be too attractive to the birds on this international flyway? Will any design be too attractive to the bird life that lives year round in the Bay Area?

Staff response: In addition to implementing a landscape plan designed to deter perching opportunities, the Applicant will control bird access through the use of exclusion techniques. These techniques have been reviewed and approved by the USFWS, CDFG and the CEC.

Viola Saima-Barklow, public comment form dated August 20, 2001:

What impact will the proposed project have on nesting swallows?

Staff response: Staff has been informed by Applicant that the proposed power plant facilities will not provide suitable nesting opportunities since the majority of the facilities will lack overhangs and eaves. In addition, the majority of the project facilities will be smooth, painted, metal surfaces that are not used by swallows for nesting. The Applicant has indicated that birds will be discouraged from using the RCEC for nesting through exclusion devices. Any exclusion devices employed by Applicant will need to be approved by the USFWS, CDFG and staff.

CONCLUSIONS

Calpine/Bechtel has proposed measures to mitigate impacts identified by staff as potentially significant. It is staff's opinion that implementation of the proposed mitigation measures would reduce potential impacts associated with the proposed project to levels

less than significant. However, Applicant will need to submit additional information to support their Wetland Mitigation Plan. Conceptually, the plan appears sound, but specific details concerning actions necessary to achieve desired objectives still need to be finalized. This information must be received and reviewed by the USFWS, USACE and SFRWQCB before these agencies can issue a Biological Opinion, a 404 permit and a 401 permit respectively. Staff has proposed Conditions of Certification that would insure the project owner demonstrate compliance with all applicable LORS prior to any site mobilization activities. Staff concludes that if the project is constructed and operated in compliance with all applicable LORS and CEC Biological Resources Conditions of Certification, the proposed RCEC would not adversely impact biological resources in the proposed project area.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist to the CPM for approval.

Verification:.... The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. Site and related facility activities shall not commence until an approved Designated Biologist is available to be on site.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a of a nationally recognized biological society, such as The Ecological society of America or The Wildlife Society; and
3. At least one year of field experience with biological resources found in or the project area.

If a Designated Biologist needs to be replaced, then the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist.

Designated Biologist Duties

BIO-2 The Designated Biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction/Operation Manager, supervising construction and operations engineer on the implementation of the biological resources Conditions of Certification;

2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (parking lots) for animals in harms way;
5. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification; and
6. Respond directly to inquiries of the CPM regarding biological resource issues.

Verification: The Designated Biologist shall maintain written records of the tasks described above; and summaries of these records shall be submitted in the Monthly Compliance Reports.

During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

Designated Biologist Authority

BIO-3 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist, the project owner's Construction/Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

Verification: The Designated Biologist must notify the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance,

grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

Biological Resources Mitigation Implementation and Monitoring Plan

BIO-4 .The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

The BRMIMP shall identify:

1) All Biological Resource Conditions included in the Commission's Final Decision;
2) A copy of the final, approved Perch Deterrent and Monitoring Plan. The final, approved plan will include detailed information regarding how nesting, perching/roosting of raptors and corvids (crows and ravens) will be discouraged. Also to be included are the final plans for monitoring the success of perch deterrents and the final adaptive management plan;
3) A copy of the final approved Storm Water Management Plan to be implemented so sensitive wetland habitats in the project area will not be impacted by the RCEC
4) A list of all measures which will be implemented to mitigate the construction and operational noise impacts caused by the proposed RCEC;
5) A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
6) A list of all terms and conditions set forth by the USACE Section 404 permit and state SFRWQCB 401 certification;
7) Detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
8) All locations, on a map of suitable scale, of areas requiring temporary protection and avoidance during construction;
9) Aerial photographs (scale 1:200) of all areas to be disturbed during construction activities-one set prior to site disturbance and one set after project construction. Include planned timing of aerial photography and a description of why times were chosen;
10) Duration for each type of monitoring and a description of monitoring methodologies and frequency;

11) Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

12) All performance standards and remedial measures to be implemented if performance standards are not met;

13) A discussion of biological resource-related facility closure measures;

14) A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;

15) A copy of the USFWS Biological Opinion, and incorporation of all terms and conditions into the final BRMIMP;

16) A discussion of bird flight diverters and how they will be installed, replaced and maintained during the life of the project;

17) Written verification that the required habitat compensation has been purchased and donated to EBRPD and a suitable endowment has been provided to manage the habitat compensation acreage in perpetuity;

18) A copy of the final construction noise mitigation plan;

19) A copy of the final Wetland Mitigation Plan including results of the hydrological modeling analysis and final plans for dredging and levee removal and reduction; and

20) A letter from EBRPD verifying that the endowment provided by theproject owner is sufficiently large to fund, for the life of the project, apredator management program.

Verification: At least 30 days prior to start of any site mobilization activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

Worker Environmental Awareness Program

BIO-5 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about sensitive biological resources associated with the project.

The Worker Environmental Awareness Program must:

1) Be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;

2) Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;

3) Present the reasons for protecting these resources;

4) Present the meaning of various temporary and permanent habitat protection measures; and

5) Identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification:.... No less than 30 days prior to the start of any site mobilization activities, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and keep record of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

USFWS Biological Opinion

BIO-6 Formal consultation between the USFWS and USEPA shall be completed, and the project owner shall implement all terms and conditions of the resulting Biological Opinion.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner must provide the CEC CPM with a copy of the USFWS Biological Opinion. All terms and conditions of the Biological Opinion will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

U. S. Army Corps of Engineers Section 404 Permit

BIO-7 The project owner shall acquire and implement the terms and conditions of the USACE Section 404 permit.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the permit required to fill on-site wetlands. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

San Francisco Bay Regional Water Quality Control Board Certification

BIO-8 The project owner will acquire and implement the terms and conditions of a San Francisco Bay Regional Water Quality Control Board Section 401 State Clean Water Act certification.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board certification. The terms and conditions of the certification will be incorporated into the project's Biological Resources Mitigation Implementation and Monitoring Plan.

Storm Water Management Plan

BIO-9 The project owner shall develop a RCEC Storm Water Management Plan in consultation with the U.S. Fish and Wildlife Service, East Bay Regional Parks District, Hayward Area Parks and Recreation District, San Francisco Bay Regional Water Quality Control Board, City of Hayward Public Works Department, Alameda County Flood Control District and staff.

Verification: The project owner will submit to the CPM a Storm Water Management Plan at least 60 (sixty) days prior to the start of any site mobilization activities (See Soil and Water Resources, Condition of Certification **Soil & Water-3**). The final approved plan will also be contained in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.

Habitat Compensation

BIO-10 The project owner shall provide 26.19 acres of habitat to compensate for the loss of upland, freshwater seasonal wetlands and salt marsh habitats.To mitigate the permanent and temporary loss of habitat, the project owner shall:

1. Purchase 26.19 acres of habitat adjacent to the proposed RCEC site;
2. Donate the 26.19 acres of habitat to the EBRPD;
3. Assist in arranging a long-term lease for 30 acres of salt marsh habitat owned by the City of Hayward;
4. Provide a suitable endowment fund to manage the proposed habitat compensation and the City of Hayward property in perpetuity.

Verification: Within 60 days of project certification, the project owner must provide written verification to the CPM that the required habitat compensation has been purchased, the endowment is in place to fund perpetual compensation habitat management and a lease agreement for 30 acres of salt marsh habitat has been finalized with the City of Hayward.

Facility Closure

BIO-11 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the project Biological Resources Mitigation Implementation and Monitoring Plan.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

Construction and Operational Noise Levels

BIO-12 The project owner will develop an approved construction noise mitigation plan that addresses how noise impacts to state and federally listed nesting and breeding sensitive vertebrate species will be minimized during construction.

The noise mitigation plan will discuss how pile-driving and HRSG steam blow noise will be mitigated. Regarding operational noise, the project owner shall provide written confirmation from EBRPD indicating that the habitat compensation endowment is sufficient to fund a predator management program for the life of the project. The final plan must be approved by the USFWS, CDFG, EBRPD, and staff.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide to the CEC CPM with a copy of the final, agency approved construction and operational noise mitigation plan and a signed letter from EBRPD indicating that the endowment agreement is sufficiently large to fund a predator management program.

Bird Flight Diverters

BIO-13 Bird flight diverters will be placed on all overhead ground wires associated with the RCEC power plant.

During construction of the RCEC transmission line, bird flight diverters will be installed to manufacturer's specification. The USFWS, CDFG, and staff will provide final approval of the bird flight diverter to be installed. Staff recommends that the Swan Flight Diverter be given careful consideration when making a decision about which diverter is to be installed.

Verification No less than 7 days prior to energizing the new RCEC transmission line, the project owner will provide photographic verification to the CEC CPM that bird flight diverters have been installed to manufacturer's specifications. A discussion of how the bird flight diverters will be maintained during the life of the project will be included in the project's BRMIMP.

Perch Deterrent Management Plan

BIO-14 The project owner shall provide a final, approved Perch Deterrent Management Plan.

The Perch Deterrent Management Plan shall:

1. Be approved by the USFWS, CDFG, EBRPD and staff;
2. Identify how landscaping will deter perching, nesting/roosting of raptors and corvids;
3. Identify how the effectiveness of perch deterrents will be monitored and evaluated ; and
4. Identify all measures to be implemented should monitoring indicate that perch deterrents are ineffective.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide to the CEC CPM a final approved version of the Perch Deterrent Management Plan. The final Perch Deterrent Management Plan shall be included in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.

Wetland Mitigation Plan

BIO-15 The project owner shall provide a final, approved Wetland Mitigation Plan.

The Wetland Mitigation Plan shall:

1. Be approved by USFWS, USACE, RWQCB, EPA, CDFG, EBRPD and staff;
2. Identify the timing, locations and all measures to be implemented for creation, preservation and enhancement activities;
3. Include the hydrological modeling analysis and all construction drawings to be used in support of dredging and levee removal and reduction activities; and
4. Identify performance criteria to be used in evaluating effectiveness of wetland mitigation measures.

Verification: No less than 60 days prior to any ground disturbance activities, the project owner shall provide to the CEC CPM a final, approved copy of the Wetland Mitigation Plan. The final Wetland Mitigation Plan shall be included in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.

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CULTURAL RESOURCES

Testimony of Roger D. Mason

INTRODUCTION

In this section, staff discusses potential impacts of the proposed Russell City Energy Center in Hayward regarding cultural resources, which are defined under state law in the Laws Ordinances Regulations and Standards (LORS) section of this staff assessment. A brief cultural overview of the project is provided, and an analysis of potential impacts. If cultural resources are identified, staff determines whether there may be a project related impact to identified resources, and if the resource is eligible for the California Register of Historic Resources (CRHR), staff then recommends mitigation that will reduce the impact to the historical resource to a less than significant level.

There is also a potential that a project may impact a previously unidentified resource or impact an historical resource in an unanticipated manner. Staff also recommends procedures in the conditions of certification that mitigate these potential impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

- Code of Federal Regulations, 36 CFR Part 61. Federal Guidelines for Historic Preservation Projects: The U.S. 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 mitigation of impacts to cultural resources on public lands in California.
- National Historic Preservation Act, 16 U.S.C. § 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. Regulation revised in 1997 (36 CFR Part 800 et. Seq.) set forth procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria and the process are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

STATE

- California Code of Regulations, Title 14, section 4852 defines the term "cultural resource" to include buildings, sites, structures, objects, and historic districts.
- Public Resources Code, Section 5000 establishes a California Register of Historic Places; determines significance of and defines eligible properties. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and; states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- The California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.; Title 14, California Code of Regulations, section 15000 et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code section 21083.2 states that the lead agency determines 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, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the Applicant's cost of mitigation; sets time frames for excavation; defines "unique and non-unique archaeological resources;" and provides for mitigation of unexpected resources.
- 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(b), prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project's impact on a historical resource; discusses documentation as a mitigation measure; and 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, section 15064.5 defines the term "historical resources," explains when a project may have a significant effect on historic resources, describes CEQA's applicability to archaeological sites, and specifies the relationship between "historical resources" and "unique archaeological resources."
- Penal Code, section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.

- California Health and Safety Code, section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.

LOCAL

The City of Hayward encourages preservation of historical resources by maintaining a list of architecturally and historically significant buildings.

SETTING

The proposed power plant, associated linears, and construction laydown areas and worker parking areas will be located near the former shoreline of San Francisco Bay in the City of Hayward in Alameda County. Hayward is located on the eastern shore of San Francisco Bay south of Oakland. The proposed project area is in an urban industrial environment. The western part of the parcel on which the power plant will be located is undeveloped except for radio towers and a small radio transmitter building. The eastern portion of the property is occupied by Runnels Industries, a metal refinishing firm. This portion of the parcel has recent temporary metal buildings resting on imported fill (Calpine/Bechtel 2001a). The associated proposed linears run along paved city streets or through developed industrial properties. The parcels proposed for construction laydown areas are partially covered by gravel. The worker parking areas are paved.

Archaeological evidence indicates that prior to 2,500 Before Present (BP) the San Francisco Bay area was occupied by small groups of hunter-gatherers that exploited both terrestrial and marine resources (primarily shellfish). Large shellmound sites began to be occupied around San Francisco Bay around 2,500 BP. These sites appear to be habitation sites with dense shell midden, flaked and ground stone tools, bone tools, beads, ornaments, charmstones, and burials. The shellmound sites were occupied until the arrival of the Spanish.

The project area is in territory occupied by the Native American group known to the Spanish and twentieth century ethnographers as the Costanoan (Levy 1978). The contemporary descendants of this group are members of the Ohlone Indian Tribe. Costanoan actually refers to a language family consisting of eight related languages.

Collecting and hunting parties lived in temporary camps when obtaining resources within the tribelet territory away from the village. In the project area, prehistoric archaeological sites representing villages and residential bases would likely be found along the former bay shore. The project area was near the original bay shore. (The bay shore is currently located further west because of the placement of large quantities of imported fill during the historic period).

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. Ranching continued during the American period that began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. The Gold Rush of 1849 brought large numbers of Anglo-Americans to the area

resulting in the rapid expansion of San Francisco, which became the commercial entry port for the region. Other towns in the bay area, such as Oakland and San Jose, developed rapidly after the arrival of the transcontinental railroad in 1869. The bay area towns provided commercial, warehousing, financial, and manufacturing services for the agricultural and mining areas further east. Russell City was platted as a town during the real estate boom after the 1906 San Francisco earthquake (Calpine/Bechtel 2001a). However, only three houses were actually constructed by 1910. Russell City developed further as a low income housing area and industrial area during the Depression. Archaeological sites and other cultural resources from the historic period in the project area would date to the first half of the twentieth century and would be associated with the early industrial development of Russell City. (The residential portion of Russell City was located outside the project area to the north).

ANALYSIS OF IMPACTS

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?			X	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?				X

DISCUSSION OF IMPACTS

A. Cause a substantial adverse change in the significance of a historical resource

1. A cultural resources records search and check of historical maps and aerial photographs indicated that no properties with above-ground resources of historic age have been identified within one-half mile of the power plant site and transmission line (Calpine/Bechtel 2001b). There are no structures listed on the City of Hayward's list of architecturally and historically significant buildings within two miles of the project area (Calpine/Bechtel 2001d). There are no structures on the Alameda County list of potentially significant historic buildings within two miles of the project area (Calpine/Bechtel 2001d). The Hayward Area Historical Society knows of no historical resources within 0.75 mile of the project area (Calpine/Bechtel 2001c). The Shoreline Interpretive Center has not identified any historical resources outside the boundaries of the Shoreline Park (Calpine/Bechtel 2001c). Since there are no historical resources identified, there will be no impacts.

2. A field survey of the power plant site, laydown and parking sites, gas pipeline route, water pipeline routes, and electrical transmission line route was performed by the Applicant (Calpine/Bechtel 2001b). The only potential property with above-ground resources of historic age is the electrical transmission line and towers that extend from approximately 600 feet of the project site to the existing Eastshore-Grant transmission corridor and then extend to the Eastshore Substation. The age of the existing transmission line and towers is at least 62 years since they appear on a 1939 aerial photograph (Calpine/Bechtel 2001a). The Applicant has evaluated the existing transmission towers as not eligible for the California Register of Historical Resources (CRHR). However, this evaluation was not made by an architectural historian and no resource-specific research was done to establish, age, designer, or context. The planned construction of an additional transmission line, including the addition of seven new power poles in the same corridor as the 62 year old line is a potential impact. Subsequent to the Applicant's evaluation, the transmission line was thoroughly evaluated by public historian, Cindy Baker at PAR Environmental Services, consultant to the Energy Commission and found not to be eligible for listing on CRHR. Staff concurs with PAR's evaluation (PAR 2001). Since the transmission line does not meet the criteria for listing on the CRHR, no mitigation is necessary.

B. Cause a substantial adverse change in the significance of an archaeological resource

1. A cultural resources records search indicated that no below-ground archaeological resources have been identified within one half mile of the power plant site or project linear routes (Calpine/Bechtel 2001a). The one half mile radius includes the laydown and parking sites.

2. The Applicant carried out a pedestrian survey of the proposed power plant site, laydown and parking sites, linear routes, and the Advanced Wastewater Treatment (AWT) facility. Soil surfaces were available for inspection in most of the power plant parcel, but most of the project linear routes are paved. The laydown areas are partially covered by gravel and were systematically surveyed. In addition, an open trench was available for inspection at 3500 Enterprise Avenue. The parking areas are paved and were not surveyed. In the area of the AWT, portions of the ground surface under sludge piles could not be examined. No archaeological resources were identified as a result of the surveys (Calpine/Bechtel 2001a; Foster Wheeler 2002).

3. The proposed project will not impact any known archaeological resource. However, buried archaeological resources could be encountered during project construction. The project area has been subject to high rates of deposition which would bury archaeological resources. In addition, the project area's bay shore location has a high level of sensitivity for prehistoric cultural resources (Calpine/Bechtel 2001a). The Applicant recommended worker training to increase the likelihood that workers will recognize buried cultural material during construction, but did not recommend monitoring of subsurface construction activities by an archaeologist (Calpine/Bechtel 2001a). Commission staff recommends monitoring full time by an archaeologist to ensure that any cultural resources that might be encountered during construction will

be identified and evaluated before significant impacts could occur (condition Cul-3(f) and Cul-6).

4. In the event of an unanticipated discovery, the proposed Conditions of Certification CUL-1 through CUL-7 shall apply. Implementation of the proposed Conditions of Certification CUL-1 through CUL-7 will reduce impacts to any archaeological resource identified during construction to a level of insignificance. Development of a research design prior to the start of construction that could be applied to discoveries, may reduce construction delays. Any impacts will be rendered less than significant with mitigation.

C. Disturb any human remains

1. There is no record of interred human remains that would be disturbed by the proposed project. In the event that interred human remains are encountered during project construction; the proposed Conditions of Certification CUL-1 through CUL-7 and state law shall apply.

2. The Applicant anticipates acquiring additional area to be used for parking and laydown areas. If any areas are acquired that are not already defined as part of the project, in addition to Cul1-Cul-6, condition Cul-7 shall serve to mitigate any potential impacts in these specific areas. Should human remains be encountered, mitigation will be necessary.

CUMULATIVE IMPACTS

Staff concludes that there are no known cumulative impacts because the project will not affect any known cultural or historical resources. Should any cultural resources be identified during construction, implementation of the proposed Conditions of Certification CUL-1 through CUL-7 will reduce cumulative impacts to a level of insignificance.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

The East Bay Regional Park District's letter dated August 8, 2001 (index EBRPD [8-8]-4) identifies impacts to parkland visitors as potentially significant in the area of cultural resources. In the technical area of cultural resources, staff has identified only a potential for impacts to previously undiscovered archaeological resources. Potential impacts to parkland visitors are more appropriately addressed in other technical areas.

CONCLUSIONS AND RECOMENDATIONS

Based on the discussion above, it appears that the project will not cause significant impacts to cultural resources provided the following conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1: Prior to the start of ground disturbance, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and resume of its Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, who will be responsible for implementation of all cultural resources conditions of certification.

Protocol:

(1) The resume for the CRS and alternate, if an alternate is proposed, shall include information that demonstrates that the CRS meets the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61.

The technical specialty of the CRS shall be appropriate to the needs of this project and shall include a background in anthropology, archaeology, history, architectural history or a related field

The background of the CRS shall include at least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California;

The resume shall include the names and phone numbers of contacts familiar with the CRS's work on referenced projects.

(2) The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during project ground disturbance, construction and operation.

(3) The CRS may obtain qualified cultural resource monitors to monitor as necessary on the project. Cultural resource monitors shall meet the following qualifications.

- A BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or
- An AS or AA in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

(4) The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary to this project and fulfills all the requirements of these conditions of certification. The project owner shall also ensure that the CRS obtains additional technical specialists,

or additional monitors, if needed, for this project. The project owner shall also ensure that the CRS evaluates any cultural resources that are newly discovered or that may be effected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

Verification: At least 45 days prior to the start of ground disturbance, the project owner shall submit the name and statement of qualifications of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

(1) If the CPM determines the proposed CRS to be unacceptable, the project owner shall submit another individual's name and resume for consideration. If the CPM determines the proposed alternate to be unacceptable, the project owner may submit another individual's name and resume for consideration.

(2) At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for cultural resource monitoring required by this condition. If additional monitors are obtained during the project, the CRS shall provide additional letters to the CPM, identifying the monitor and attesting to the monitor's qualifications. The letter shall be provided one week prior to the monitor beginning on-site duties.

(3) At least 10 days, prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions of certification.

(4) At least 10 days prior to the termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval.

CUL-2: Prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide them with copies to the CPM. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM. Maps shall identify all areas of the project where ground disturbance is anticipated.

(1) If construction of this project will proceed in phases, maps and drawings may be submitted in phases. A letter identifying the proposed schedule of each project phase shall be provided to the CPM.

(2) Prior to implementation of additional phases of the project, current maps and drawings shall be submitted to the CPM.

(3) At a minimum, the CRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed. A current schedule of

anticipated project activity shall be provide to the CRS on a weekly basis during ground disturbance and provided to the CPM in each Monthly Compliance Report (MCR).

Verification: At least 40 days prior to the start of ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings.

1. If this is to be a phased project, a letter identifying the proposed schedule of the ground disturbance or construction phases of the project shall also be submitted.

2. At least 30 days prior to the start of ground disturbance on each phase of the project, following initial ground disturbance, copies of maps and drawings reflecting additional phases of the project, shall be provided to the CPM for review and approval.

3. If there are changes to the scheduling of the construction phases of the project, aletter shall be submitted to the CPM within 5 days of identifying the changes. A copy of the current schedule of anticipated project activity shall be submitted in each MCR.

CUL-3: Prior to the start of ground disturbance; the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and 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 ground disturbance.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures.

a. A proposed general 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.
b. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.
c. 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.
d. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
e. A discussion of all avoidance 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.

f. A discussion of the location(s) where monitoring of project construction activities is deemed necessary. Monitoring shall be conducted full time, during ground disturbance on the project site, linear alignments, and staging areas.

g. A discussion of the requirement that all cultural resources encountered will be recorded on a DPR form 523 and mapped (may include photos). In addition all archaeological materials collected as a result of the archaeological investigations shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," 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.

   Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how requirements, specifications and funding will be met. Also the name and phone number of the contact person at the institution shall be included. In addition, include information indicating that the project owner will pay all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.

h. 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.

i. A discussion of the proposed Cultural Resource Report which shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines. The CRR shall include all cultural resource information (survey, testing, monitoring, data recovery, and analysis) obtained as a result of this project. All survey reports and additional research reports, not previously submitted to the CHRIS, shall be included as an appendix to the CRR. Maps delineating the location of all archaeological work shall be included in the CRR. Tables, charts or graphs shall be included as necessary. Descriptions of soils shall be included wherever subsurface excavations are undertaken for archaeological testing or data recovery or where monitoring of excavations occurs. This report shall be submitted to the CPM after the conclusion of ground disturbance (including landscaping). This report shall be considered final upon approval by the CPM.

Verification: At least 30 days prior to the start of ground disturbance, 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.

At least 30 days prior to ground disturbance the project owner shall submit a letter to the CPM indicating that they will pay any curation fees for curation of any collected archaeological artifacts.

The CRR shall be submitted to the CPM within 90 days after completion of ground disturbance (including landscaping) for review and approval. Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the curating institution (if archaeological materials were collected), the SHPO and the CHRIS.

CUL-4: Worker Environmental Awareness Training for all new employees shall be conducted on a weekly basis, prior to beginning and during periods of ground disturbance. The training may be presented in the form of a video. The training shall include a discussion of applicable laws and penalties under the law. Training shall also include samples or visuals of artifacts that might be found in the project vicinity and the information that the CRS, alternate CRS or monitor has the authority to halt construction in the event of a discovery or unanticipated impact to a cultural resource. The training shall also instruct employees to halt or redirect work in the vicinity of a find and to contact their supervisor and the CRS or monitor. An informational brochure shall be provided that identifies reporting procedures in the event of a discovery. Workers shall sign an acknowledgement form that they have received training and a sticker shall be placed on hard hats provided indicating that environmental training has been completed.

Verification: Copies of acknowledgement forms signed by trainees shall be provided in the MCR.

CUL-5: The CRS, alternate CRS and the Cultural Resources Monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered or if known resources may be impacted in a previously unanticipated manner.

If such resources are found, the halting or redirection of construction shall remain in effect until all of the following have occurred:

a. the CRS has notified the CPM and the project owner of the find and the work stoppage;

b. the CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and

c. any necessary data recovery and mitigation has been completed.

If data recovery or other mitigation measures are required, the CRS and/or the alternate CRS and cultural resource monitor(s), including Native American monitor(s), shall monitor these data recovery and mitigation measures, as needed.

For any cultural resource encountered, the project owner shall notify the CPM within 24 hours after the find.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS and cultural resources monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find and stating that the CRS will notify the CPM and project owner within 24 hours after a find.

CUL-6: The CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linears and ground disturbance at laydown areas to ensure there are no impacts to undiscovered resources. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter providing a detailed justification for that decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

(1) Monitors shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

(2) The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24hrs. of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

(3) Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

(4) A Native American monitor shall be obtained, at a minimum on an on call basis, o monitor ground disturbance in areas where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored.

Verification: During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.

(1) During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM as needed.

(2) Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

(3) One week prior to ground disturbance in areas where there is a potential to discover Native American artifacts, the project owner shall send notification to the CPM identifying the person(s) retained at a minimum, an on an on-call basis to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-7: If the construction and laydown areas are to be located anywhere but in an area defined as 1) a 10-acre parcel at 3548/3600 Depot Road, 2) a 5-acre parcel at 3600 Enterprise Avenue, 3) approximately 10 acres of open and unused land surrounding PG&E's Eastshore Substation, or 4) 3500 Enterprise Avenue, 3458 Enterprise Avenue, 3440 Enterprise Avenue or 3643 and 3639 Depot Road, then a cultural resources assessment shall be conducted. The cultural resource assessment shall consist of a records search and a pedestrian survey which gives equal emphasis to prehistoric and historic resources and an evaluation of significance for any resources that are within or adjacent to the parking area or laydown boundaries. All cultural resources identified within or adjacent to the project shall be recorded on a DPR form 523A. If Native American artifacts may be encountered, a monitor with historic ties to the affected area shall be retained as part of the cultural resources team during any surveys or subsurface investigation.

Verification: At least 30 days prior to the start of ground disturbance at the newly identified location(s) of the parking or laydown areas, the project owner shall submit the results of the records search and the results of the survey for approval by the CPM. An evaluation, including site records, of all cultural resources within or adjacent to the parking and laydown area boundaries shall also be submitted. The information shall also include the name and tribal affiliation of the Native American monitor, if a Native American monitor has been retained.

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HAZARDOUS MATERIALS

Testimony of Alvin Greenberg, Ph.D.

INTRODUCTION

The hazardous materials sections of this Final Staff Assessment (FSA) provides a discussion of staff's evaluation of the potential for impacts of the proposed Russell City Energy Center (Calpine/Bechtel 2001) associated with the handling of hazardous materials issues. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts during project construction, operation and closure. Energy Commission staff has determined that all CEQA checklist items for hazardous materials are either "less than significant impact" or "no impact". A brief overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to these subject items. The section concludes with the staff's proposed monitoring and mitigation measures, with the inclusion of ten conditions of certification.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

A framework, based on environmental laws, ordinances, regulations and standards (LORS), exists to reduce risks of accidents and reduce routine hazards. The following federal, state, and local laws generally apply to the protection of public health and **Hazardous Materials Management**. Their provisions have established the basis for staff's determination regarding the significance and acceptability of the Russell City Energy Center project.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499, §301,100 Stat. 1614 [1986]), also known as SARA Title III, contains the Emergency Planning and Community Right To Know Act (EPCRA) as codified in 42 U.S.C. §11001 et seq. This Act requires that certain information about any release to the air, soil, or water of an extremely hazardous material must be reported to state and local agencies.

The Clean Air Act (CAA) of 1990 (42 U.S.C. §7401 et seq. as amended) 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 CAA section on Risk Management Plans - codified in 42 U.S.C. §112(r) - 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 the CAA are reflected in the California Health and Safety Code, section 25531 ET seq.

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

- Class 1: Pipelines in locations with ten or fewer buildings intended for human occupancy.

- Class 2: Pipelines in locations with more than ten but fewer than 46 buildings intended for human occupancy. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period (The days and weeks need not be consecutive).

The natural gas pipeline will be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-D & E and 58-A standards as well as various PG&E standards. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days;
- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. This part contains regulations governing pipeline construction, which must be, followed for Class 2 and Class 3 pipelines.

STATE

The California Accidental Release Prevention Program (Cal-ARP) - Health and Safety Code, section 25531 - 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).

Section 25503.5 of the California Health and Safety Code requires facilities which store or use hazardous materials to prepare and file a Business Plan with the local Certified Unified Program Authority (CUPA), in this case the City of Hayward. This Business Plan is required to contain information on the business activity, the owner, a hazardous

materials inventory, facility maps, an Emergency Response Contingency Plan, an Employee Training Plan, and other recordkeeping forms.
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 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.

The City Of Hayward Zoning Ordinance Article 8 (Ord. No. 83-031 and 84-029) requires compliance with this section's provisions as well as the California Code of Regulations involving hazardous materials. An Administrative Use Permit will be required for the use and storage of certain hazardous materials above threshold quantities. The City Of Hayward Fire Department Hazardous Materials Office is the Administering Agency for the RCEC.

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 the outdoor storage of ammonia. The administering agency is the City of Hayward Fire Department.

SETTING

Calpine/Betchtel (2001) proposes to construct, own, and operate an energy generating facility in the Industrial Corridor of the City of Hayward, Alameda County, California, to be known as the Russell City Energy Center (RCEC). The RCEC will be a natural gas-fired, combined-cycle electric generating facility rated at a nominal gross generating

capacity of 600 megawatts (MW). The proposed 14.7-acre project site is located at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility (WPCF). Approximately 11 acres of the 14.7-acre proposed site for the RCEC is currently occupied by the transmitter facilities of Radio Station KFAX, AM 1100. Please refer to the **Project Description** section for more detail.

ANALYSIS OF IMPACTS

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDOUS MATERIALS Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport or use of hazardous materials?		X		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		X		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X

DISCUSSION OF IMPACTS

The basis for designations provided in the checklist are discussed below.

A) Significant Hazard To Public Through Transport Or Use

A variety of hazardous materials are proposed for storage and use during the construction of the project and for routine plant operation and maintenance. All hazardous materials to be used during operation of the facility are included in the AFC in Tables 8.5-3 and 8.5-6. Most of these hazardous materials are 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. Large quantities of aqueous ammonia (28% solution), sulfuric acid, sodium hypochlorite, and sodium hydroxide will be stored on-site. Of these, only aqueous ammonia has sufficient vapor pressure to potentially cause off-site impacts. 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.

The hazard characteristics of ammonia and natural gas and their proposed use during the operation of the plant pose the principle risk of off-site impacts. The potential threats from the other hazardous materials are not as significant as they are to be stored, handled or used for routine purposes in relatively smaller quantities at the facility and also have lower toxicity and/or environmental mobilities. The applicant will be restricted to the use, strength, and quantity of the hazardous materials identified in the AFC (see **Condition of Certification HAZ-1**).

Additionally, the accidental mixing of sodium hypochlorite with acids or aqueous ammonia could result in toxic gases. Given the large volumes of both aqueous ammonia (12,000 gallons) and sodium hypochlorite (5,000 gallons) proposed for storage at this facility, the chances for accidental mixing of the two – particularly during transfer from delivery vehicles to storage tanks –should be reduced as much as possible. Thus, measures to prevent such mixing are extremely important and will be required as an additional section within a Safety Management Plan for delivery of aqueous ammonia (see **Condition of Certification HAZ-3**).
Approximately 5,000 pounds of 93 percent sulfuric acid will be used and stored on-site. This material does not pose a risk of off-site impacts, because it has relatively low vapor pressures and thus spills would be confined to the site. Because of public concern at another proposed energy facility in 1995, staff conducted a quantitative assessment of the potential for impact associated with sulfuric acid use, storage, and transportation. Staff found no hazard would be posed to the public. However, in order to protect against risk of fire, an additional Condition of Certification (see **HAZ-5**) will require the project owner to ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank.

Aqueous Ammonia

Selective Catalytic Reduction (SCR) is proposed to reduce nitrogen oxide (NOx) emissions to meet the plant's air quality permit requirements. Aqueous ammonia reacts with a catalyst to convert the NOx into inert water vapor and nitrogen in the SCR process. The aqueous ammonia proposed for use is a solution 28% ammonia and 72% water. Solutions containing more than 20% ammonia are considered regulated materials exceeding reportable quantities defined in the California Health & Safety Code section 25532(j). Use of Aqueous ammonia significantly reduces the risks that would otherwise be associated with use of the more hazardous anhydrous form of ammonia. The aqueous form eliminates the high internal energy associated with the more lethal 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 that 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 also much easier to contain than those associated with the anhydrous form. In addition, relatively slow mass transfer from the free surface of the spilled aqueous solution limits emissions from a spill of aqueous ammonia.
Aqueous ammonia is typically transported and handled safely and without incident. However mishandling can result in impacts on public health, particularly during transfer from a delivery vehicle to a storage tank. It is during this transfer operation

that the greatest risk of an accidental spill and release could occur. An RMP for the proposed aqueous ammonia storage tank and delivery vehicle transfer pad will be prepared and submitted to the US EPA and the City of Hayward Fire Department for review and approval. The results of the off-site consequence analysis (AFC section 8.5.2.1) showed no impacts off-site. A significant number of modern power plants routinely use aqueous ammonia and the California Energy Commission has licensed many such plants. Much of the risks associated with ammonia use are already reduced through the Russell City Energy Center's proposed use of the aqueous form of ammonia and the use of engineering controls such as enclosure of the tank within a secondary containment structure equipped with a water spray vapor control system. Project compliance with LORS and staff's proposed mitigation make it unlikely that the use aqueous ammonia will result in significant threat to public health and the environment.

The transportation of hazardous materials including aqueous ammonia particularly on California freeways, is routinely regulated and controlled by various federal and state laws, ordinances, regulations, and standards as discussed in the section titled Traffic and Transportation. There are a number of transportation accident studies that support the fact that such incidents and corresponding chances are highly dependent on the type of roadway and surroundings. It has been reported that the truck accident frequency is highest for an undivided multilane road at 5.44 accidents per million miles compared to 0.93 accidents per million miles for a freeway in rural California (Davies et al. 1992). Similarly, the accident rate in urban California is highest for a multilane that is undivided at 13.02 accidents per million miles vis-a-vis 1.59 accidents per million miles on a freeway. A recent study went even further by concluding that releases of hazardous materials on freeways rarely play a role in deaths or injuries (FMCSA, 2000). It is therefore reasonable to say that the likelihood of an accident involving a release of ammonia is probably higher on the local roads than on the freeways. This is supported by a report that observed that accident rates are typically much higher for two-lane rural roads compared to multi-lane highways (USDOT 1998).

Staff has evaluated the proposed route to be used for shipment of hazardous materials to the facility and concludes that the risk to the risk of public impact from transportation of aqueous ammonia is not significant. Most of the transportation route is on Interstate Highways 580 and 880 and State Highway 92, all multi-lane divided highways. The facility is located approximately one mile from SR92 and the off-ramp has no sharp turns while the local streets run through an industrial and office-building corridor. It is therefore very unlikely that a serious release would occur in the project area. Staff has proposed **Conditions of Certification HAZ-6 and 7** to address transportation of aqueous ammonia and other hazardous materials.

Staff therefore concludes that any potential adverse impacts from the transport of aqueous ammonia can be easily limited to a level of insignificance through the Applicant's conformance to applicable standards and laws, reinforced by staff's proposed mitigation.

Natural Gas

The primary fuel source for the proposed project is natural gas. Natural gas poses a fire and/or explosion risk as a result of its flammability. The risk of a fire and/or explosion from these gases 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 (NFPA 1987). 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.

A new 16-inch pipeline 0.9 miles in length will be placed underground from the PG&E distribution line on the east side of the Union Pacific Railroad line. It will follow Enterprise Avenue into the facility. The facility will also require the installation of a one-mile natural gas pipeline that could result in an accidental release of natural gas. The design of the natural gas pipeline is governed by laws and regulations discussed here and in section 5.0 of the AFC. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds.

Many failures of older natural gas lines have been associated with poor quality gas welds. Failures in older pipelines have also resulted from corrosion. Current codes address this failure mode by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure particularly relevant to the project area is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes. Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, and the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines, which failed, were older and not manufactured nor installed to modern code requirements.

The natural gas pipeline for the proposed facility will be installed by Calpine/Betchtel and built to PG&E specifications. The pipeline will be 16 inches in diameter. The pipeline will be tested and designed for the appropriate pressure. If loss of

containment occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release can result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route. However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or 2.5×10^{-4} incidents per mile per year (SERA 1993). DOT has also evaluated and categorized the major causes of pipeline failure. To summarize, the four major causes of accidental releases from natural gas pipelines are: Outside Forces-43 percent, Corrosion-18 percent, Construction/Material Defects-13 percent, and Other-26 percent.

Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture as seen in the Marina District of San Francisco during the 1989 Loma Prieta Quake and in Kobe, Japan in January 1995. The fourth category, "Other" includes equipment component failure, compressor station failures, operator errors and sabotage. The average annual service incident frequency for natural gas transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged and the uncertainty regarding the locations of older pipelines.

In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. DOT has reported that from 1970 to 1992, with 300,000 miles of natural gas pipelines in service, there were 6,500 incidents, 565 injuries, 95 fatalities, and over $140 million in property damage associated with natural gas pipelines.

Thus, the following safety features will be incorporated into the design and operation of the natural gas pipeline: (1) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (2) the pipeline will be surveyed for leakage annually (3) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (4) valves at the meter will be installed to isolate the line if a leak occurs. (See **Conditions of Certification HAZ - 8, 9, and 10**)

B) Significant hazard due to accidents - see **a)** above

C) Significant hazard to school

There are no known schools within a ¼ mile radius of proposed project.

IMPACTS

ENVIRONMENTAL JUSTICE

In the **Socioeconomics** section of this staff analysis, staff presents census tract information that shows no significant poverty populations within six miles of the project, however, there are minority populations within six miles of the project. Since staff has concluded that there will be no significant direct or cumulative hazardous materials management related impacts, there will also be no significant impact to any minority populations that have been identified. Therefore, there are no environmental justice issues.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments were received.

CONCLUSIONS

By incorporating the appropriate mitigation measures, the routine transport and use of hazardous materials at the project will not result in significant impacts to the public or the environment. By following all applicable LORS, worker safety programs and fire protection systems are adequate to maintain safety at the facility.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in any quantity or strength not listed in AFC Tables 8.5-3 and 8.5-6 unless approved in advance by the CPM.

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

HAZ-2 The project owner shall provide a Risk Management Plan RMP and a Hazardous Materials Business Plan HMBP (which shall include the proposed building chemical inventory as per the UFC) to the City of Hayward Fire Department and the CPM for review at the time the RMP plan is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall include all recommendations of the City of Hayward Fire Department and the CPM in the final documents. A copy of the final plans, including all comments, shall be provided to the City of Hayward and the CPM once EPA approves the RMP.

Verification: At least 30 days prior to the commencement of construction, the project owner shall provide the final plans (RMP and HMBP) listed above and accepted by the City of Hayward to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan (SMP) for delivery of ammonia. The plan shall include procedures, protective

equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

Verification: At least sixty days prior to the delivery of aqueous ammonia to the ammonia storage tanks, 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 the storage volume.

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

HAZ-5 The project owner shall ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank.

Verification: At least sixty (60) days prior to receipt of sulfuric acid on-site, the Project Owner shall provide to the CPM for review and approval copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any combustible or flammable material and the route by which such materials will be transported through the facility.

HAZ-6 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles, which meet or exceed the specifications of DOT Code MC-307.

Verification: At least sixty (60) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-7 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (SR92 to Clawiter to Enterprise to the facility).

Verification: At least 60 days prior to receipt of any hazardous materials on site, the project owner shall submit to the CPM for review and approval, a copy of the letter to be mailed to the vendors. The letter shall state the required transportation route limitation.

HAZ-8 The project owner shall require that the gas pipeline undergo a complete design review and detailed inspection every 30 years and each 5 years thereafter.

Verification: At least thirty days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline design review to the CPM for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented.

HAZ-9 After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline shall be inspected by the project owner.

Verification: At least thirty days prior to the initial flow of gas in the pipeline, the project owner shall provide to the CPM a detailed plan to accomplish a full and comprehensive pipeline inspection in the event of an earthquake for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

HAZ-10 The natural gas pipeline shall be designed to meet CPUC General Order 112-D&E and 58 A standards, or any successor standards, and will be designed to meet Class III service. The pipeline will be designed to withstand seismic stresses and will be leak surveyed annually for leakage. The project owner shall incorporate the following safety features into the design and operation of the natural gas pipeline: (1) butt welds will be x-rayed and the pipeline will be pressure tested prior to the introduction of natural gas into the line; (2) the pipeline will be surveyed for leakage annually; (3) the pipeline route will be marked to prevent rupture by heavy equipment excavating in the area; and (4) valves will be installed to isolate the line if a leak occurs.

Verification: Prior to the introduction of natural gas into the pipeline, the project owner shall submit design and operation specifications of the pipelines to the CPM for review and approval.

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LAND USE

Testimony of Jon Davidson, AICP and David Flores

INTRODUCTION

This land use analysis of the Russell City Energy Center (RCEC) 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 may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health, or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The project site is situated within the City of Hayward in Alameda County, which is situated in the East Bay Subregion of the San Francisco Bay Area. Land use LORS applicable to the proposed project are contained in the City of Hayward's General Plan and Zoning Ordinance. In addition, the Hayward Area Shoreline Planning Agency (HASPA) performs recreation and resource planning for the area; however, this planning agency does not have any land use authority over the project site. As described below, the provisions of the Bay Conservation and Development Commission's (BCDC's) San Francisco Bay Plan are applicable to areas near the project site, but the project site does not lie within the BCDC jurisdiction.

CITY OF HAYWARD GENERAL PLAN

Land uses are controlled and regulated through a series of goals and policies contained in plans adopted by the local jurisdiction that has land use authority over the area (in this case, the City of Hayward). Local agencies with land use authority (i.e., cities and counties) are required to adopt a General Plan for the area within their jurisdiction that sets forth policies regarding land use and other planning topics. The General Plan is the broadest planning document applicable to the site, expressing broad goals and policies to guide local decisions on future growth, development, and conservation. Other local plans, as well the zoning ordinance that regulates land use, must be consistent with the goals and policies expressed in the General Plan.

The Hayward General Plan was adopted in 1986 and has been selectively amended since. In its preface, the Hayward General Plan is described as an official policy document adopted as a guide for making decisions concerning the development of the community according to desired goals. When adopted in 1986, it was intended to shape the future physical development of the city for the next 20 to 25 years. The Hayward General Plan does not have a separate Land Use Element. Instead, the City's land use goals and policies are integrated within the General Policies Plan (adopted May 1986) and the Growth Management Element (adopted July 1993) of the General Plan.

The General Plan designates the project site and surrounding area for industrial land uses. More specifically, the project site is located within an area designated as the

Industrial Corridor, which forms a crescent encompassing the western and southern edges of the city. The transmission line and natural gas supply line routes are located entirely within the Industrial Corridor area. According to the City's General Policies Plan, areas designated Industrial Corridor are planned for "business and industrial parks along with supporting office and commercial uses."

The Economic Development chapter of the General Policies Plan only contains one policy statement that is directly relevant to the proposed project: "The City will seek to maintain the efficiency of the Industrial Corridor with road and transit improvements and encouragement of appropriate land use." The General Policies Plan presents the following strategies to support this policy:

- Limit non-industrial uses in the Industrial Corridor which would interfere with the primary use of the area as industrial land.
- Improve traffic conditions in the Industrial Corridor by coordinating roadway and transit improvements.
- Promote and protect the appearance of the Industrial Corridor to encourage further quality development.

The Growth Management Element does not present any specific goals or objectives for the Industrial Corridor, but does include the following economic development strategies for the area:

- Form a Task Force for the Industrial Corridor with business people and residents to identify specific sites or "opportunity areas" for highly desirable uses and to develop circulation recommendations including transit service.
- Evaluate the feasibility of the following specific proposals:
- Recognize the increased visibility and accessibility of the (Hayward) airport's Hesperian frontage once "A" Street is extended; consider leasing property for commercial development to increase tax revenues.
- Adopt the proposed Light Industrial Zone to provide buffer areas between industrial and residential areas.
- Provide incentives for desirable uses such as warehouse retail (e.g., commercial zoning, "fast-tracking" processes) as consistent with traffic capacity.
- Provide for uses which enhance the tax base and provide lunch-time or off-hours retail opportunities, restaurants, services, etc.
- Pursue implementation of proposed circulation improvements through adoption of the Industrial Assessment District or other funding.

The Growth Management Element also recommends the development of an area plan for the Industrial Corridor, but no such plan has yet been developed.

CITY OF HAYWARD ZONING ORDINANCE

Zoning is the specific administrative tool used by a jurisdiction to regulate land use and development, and is one of the primary tools for implementing the goals and policies of the General Plan. Zoning is typically more specific than the General Plan and includes

detailed land use regulations and development standards. The City's Zoning Ordinance divides the land in the city into zones that permit different types of uses and imposes development standards appropriate to the uses permitted in each zoning district. **LAND USE Figure 1** shows the zoning districts in the area of the proposed project site. The RCEC project site is located in the Industrial (I) zoning district. This zoning applies to lands in the Industrial Corridor that wrap around the western and southern perimeter of the city. The transmission line and natural gas supply line routes are also located within the "I" District.

The purpose of the "I" District (Section 10-1.1600 of the Hayward Zoning Ordinance) is "to provide for and encourage the development of industrial uses in areas suitable for same, and to promote a desirable and attractive working environment with a minimum of detriment to surrounding properties." The "I" District permits a broad array of industrial uses, administrative and professional offices/services, automobile-related uses, personal services, retail commercial uses, and service commercial uses. Power plants are not specifically listed as a permitted use in the "I" District.

The Zoning Ordinance (Sections 10-1.1625 through 10-1.1635) contains the following development standards applicable to the proposed project:

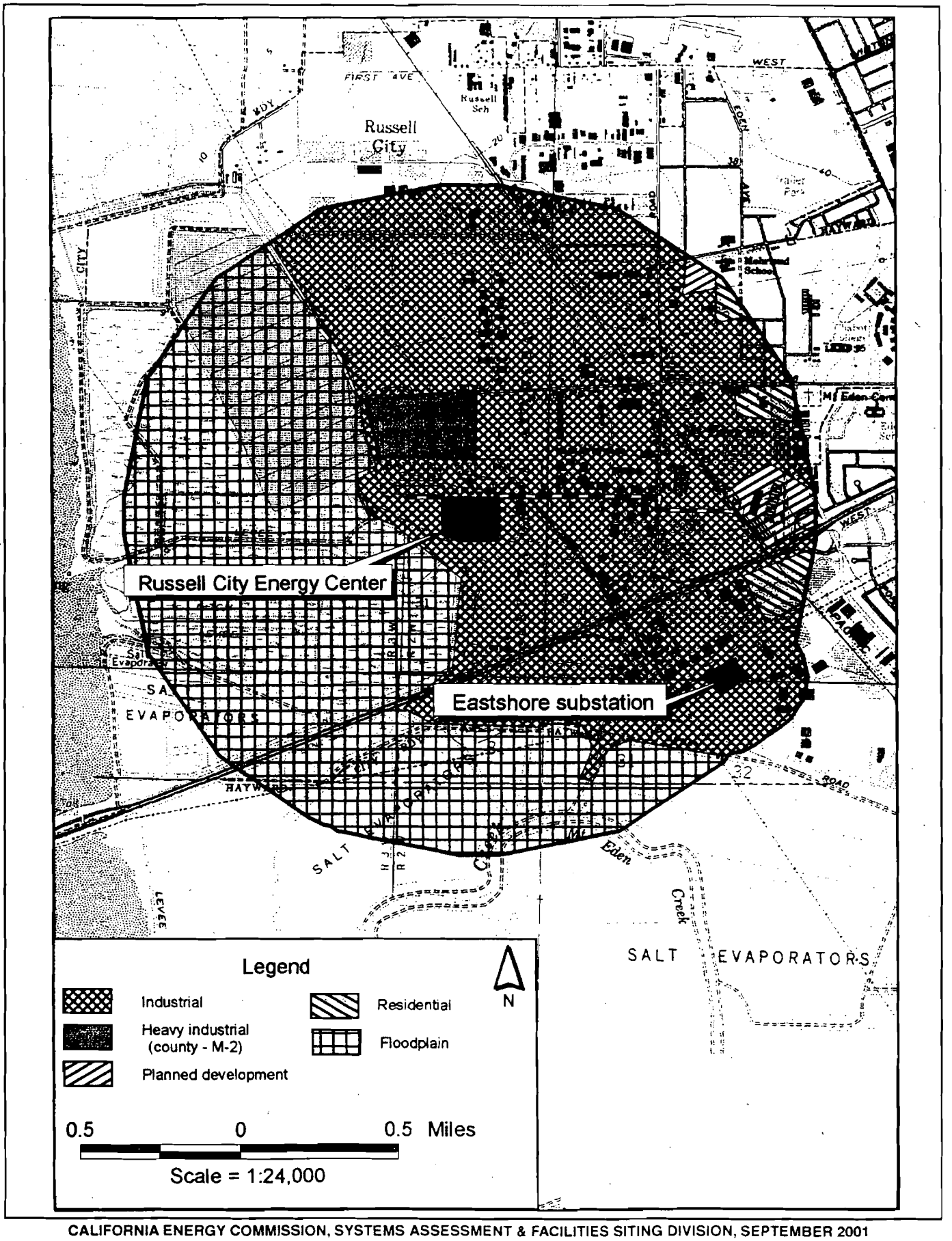
Lot Requirements	Minimum Lot Size:	10,000 square feet
	Minimum Lot Frontage:	35 feet
	Minimum Average Lot Width:	70 feet
	Maximum Lot Coverage:	None
Yard Requirements	Minimum Front Yard:	10 feet
	Minimum Side Yard:	None
	Minimum Side Street Yard:	10 feet
	Minimum Rear Yard:	None
Height Limits	Maximum Building Height:	No limit

The Zoning Ordinance (Section 10-1.1645) also includes minimum design and performance standards applicable to the construction of industrial and commercial buildings in the "I" District. These include standards for architectural design, fences and walls, landscaping, lighting, outdoor storage, signs, and other design features.

HAYWARD AREA SHORELINE PLANNING PROGRAM

The Hayward Area Shoreline Planning Agency (HASPA) was formed in 1970 to formulate plans and programs for the Hayward shoreline on San Francisco Bay. HASPA's areas of concern are environmental protection, historic preservation, education/research, recreational opportunities, industrial development, and land management. The members of HASPA include the City of Hayward, East Bay Regional Park District, Hayward Area Recreation and Park District, Hayward Unified School District, and San Lorenzo Unified School District. The RCEC site is located within the boundaries of the HASPA planning area, which generally includes the

LAND USE - Figure 1
Russell City Energy Center - Zoning



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, SEPTEMBER 2001
SOURCE: AFC Figure 8.6-2

area between the Union Pacific railroad line and the shore of the Bay within Hayward. HASPA is an advisory body in land use matters and the Agency does not have land use authority over the project or the project site.

SAN FRANCISCO BAY PLAN

The Bay Conservation and Development Commission (BCDC) administers the local coastal management program in the San Francisco Bay Plan. The Bay Plan regulates filling and dredging in the Bay and new development within 100 feet of the shoreline, and seeks to protect shoreline areas suitable for high priority water-oriented uses (i.e., ports and harbors). The project site is not located within 100 feet of the shoreline and thus does not lie within the BCDC jurisdiction (Calpine/Bechtel, 2001a). However, due to the project site's proximity to the Bay, staff reviewed the Bay Plan to assess whether the proposed project would conflict with any land use policies set forth in the plan. Part Four of the Bay Plan, Development of the Bay and Shoreline, presents the policies most relevant to land use, in particular the section entitled Other Uses of the Bay and Shoreline. The proposed project would fall within the category referred to as "Industry not related to the Bay," since the project is not dependent on the Bay for any reason (e.g., cooling).

The land use policies of the Bay Plan policies stress the importance of reserving shoreline areas for priority uses (e.g., water-related industry, ports, and recreation) and the importance of providing shoreline access for the public. Because the proposed project is not located on the shoreline or waterfront, these policies are not relevant to the project. The Bay Plan does not contain any policies regarding land uses in inland areas or areas adjacent to BCDC jurisdiction. As a result, staff did not identify any conflicts between the proposed project and the land use policies in the Bay Plan. However, the Bay Plan does contain policies related to scenic views that are considered relevant to the proposed project. These policies are addressed in the **VISUAL RESOURCES** section of this FSA.

SETTING

PROJECT LOCATION

The project site is located in the City of Hayward in Alameda County, which is part of the San Francisco Bay area. Hayward is situated along the southeastern shoreline of the Bay, at the junction of Interstate 880 and Highway 92. Other nearby cities include San Leandro and Oakland to the north, and Newark, Union City, and Fremont to the south. Hayward has a population of 144,000 (Dept. of Finance, 2001) and encompasses a land area of approximately 61 square miles.

The proposed RCEC project site is located in an area referred to as the Hayward Industrial Corridor that extends along the western and southwestern perimeter of the city. This area contains a diverse mix of both small and large light industrial, heavy industrial, and office uses. Although some retail commercial uses and a few residences are interspersed through the area, the vicinity of the project site is predominantly industrial in nature, characterized by manufacturing, processing, and fabricating facilities; trucking, distribution, and warehouse facilities; contractor yards and

construction supply; auto wrecking and vehicle storage; and miscellaneous industrial and business park developments.

The proposed RCEC site is located in the vicinity of the Hayward Regional Shoreline, which encompasses 1,682 acres along the eastern shore of San Francisco Bay consisting of salt, fresh, and brackish water marshes and seasonal wetlands. The Hayward Regional Shoreline is managed by the East Bay Regional Park District and contains a large marsh restoration project (including Cogswell Marsh and Oro Loma Marsh) and hiking and bicycling trails, including a portion of the Bay Trail. The Shoreline Interpretive Center, located on Breakwater Avenue near Highway 92 (approximately 0.7 miles southwest of the RCEC site), is managed by the Hayward Area Recreation District (HARD) and features natural history, ecology, and marine life exhibits.

SITE AND VICINITY DESCRIPTION

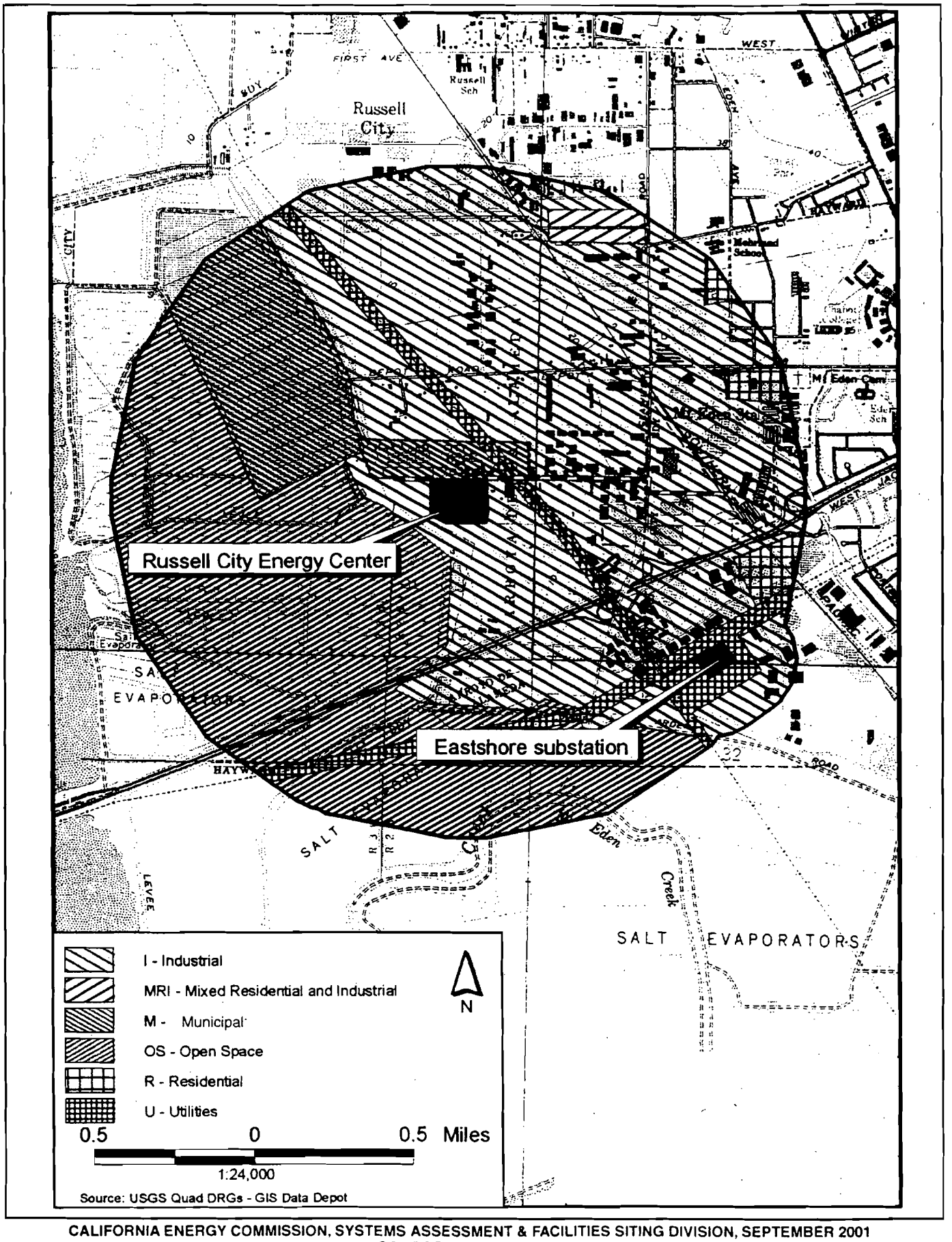
Proposed Project Site

The proposed RCEC site consists of two parcels together totaling 14.7 acres. The first and larger of the two parcels currently contains the transmitter facilities of Radio Station KFAX, AM 1100. These facilities consist of four 223.6-foot-high radio broadcast towers and a small transmitter utility building. The second parcel, located along the Whitesell Street frontage, is currently occupied by a sandblasting and metal paint finishing facility operated by Runnel Industries. This facility consists of several shed-type structures (including corrugated metal Quonset huts), a small single-story office, and unpaved open yard area with open storage of structural metal components and scrap. Both parcels are enclosed by perimeter chain-link fences.

Existing Adjacent Uses

LAND USE Figure 2 shows the existing land uses in the project vicinity. As indicated above, the proposed RCEC site is located in a predominantly industrial area. Adjacent uses include a trucking/distribution center to the west (Enterprise Distribution Center), the City of Hayward Water Pollution Control Facility (WPCF) across Enterprise Avenue to the north, a vacant city-owned parcel to the northwest, a trucking yard (MAG Industries) across Whitesell Street to the east, a paint polymers plant (Rohm and Haas) to the southeast, and a business park complex (Whitesell Business Center) to the south. Also to the south, between the project site and the Whitesell Business Center, are a railroad spur line and a flood control channel. The land to the southwest of the project site is open marsh that is owned by Waste Management Corporation and the City of Hayward. Waste Management Corporation's parcel is vacant and the City's parcel is used for stormwater retention.

LAND USE - Figure 2
Russell City Energy Center - Existing Land Use



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, SEPTEMBER 2001
SOURCE: AFC Figure 8.6-1

ENVIRONMENTAL IMPACTS

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
LAND USE AND PLANNING -- Would the project:				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?		X		
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

DISCUSSION OF IMPACTS

LAND USE AND PLANNING

A. Physical Division of an Existing Community

The proposed RCEC project has no potential to physically divide an existing community. The site is located in an established industrial area near the western edge of the City of Hayward. The power plant would be located entirely on private property and neither the size nor nature of the project would result in a physical division of an established community. No new physical barriers would be created by the project (public access across the site is not currently allowed) and no existing roadways or pathways would be blocked. The new transmission line associated with the project would be located in an existing transmission corridor and would not represent a new physical barrier. The natural gas supply line would be located underground and therefore would not result in physical barrier capable of dividing the community. Given its location, the project would not alter existing residential, recreational, commercial, institutional, and other industrial land use patterns in the area. Therefore, there would be no impact.

B. Conflict with any Applicable Land Use Plan, Policy, or Regulation

The proposed RCEC project would comply with the City of Hayward's LORS. The proposed project is appropriately sited in an area designated for industrial development in the General Plan. The City's General Plan policies concerning the Industrial Corridor are generally supportive of new industrial projects for economic development reasons, rather than restrictive or prohibitive. Staff has concluded that

the proposed project does not conflict with the any of the relevant land use policies contained in the Hayward General Plan.

The goals, policies, and strategies contained in the "Economic Development" chapter of the General Policies Plan and the "Housing and Economic Development" chapter of the Growth Management Element are the most relevant to land uses in the City's Industrial Corridor. The General Policies Plan indicates that concerns for the Industrial Corridor at the time the current General Plan was adopted were traffic and the introduction of non-industrial uses. Improvements to add roadway capacity were planned to address increased traffic generated by development in the Industrial Corridor.

The General Plan noted a trend toward new commercial, recreation, office, and research and development uses encroaching into the Industrial Corridor. The Growth Management Element identifies the Industrial Corridor as a "potential change area" where new growth can be channeled that would be beneficial to the city in terms of improved quality of life and enhanced economic vitality. The Growth Management Element also notes the potential benefits of industrial growth in terms of jobs and tax revenues.

Of the various zoning districts in the City's Zoning Ordinance, the "I" District in which the project site is located is the most appropriate zoning district for a power plant. Although power plants are not specifically listed as permitted in the "I" District, this zoning district is the City's most intensive industrial zoning category, permitting a range of light and heavy industrial uses. The project complies with all of the applicable development standards (lot, yard, and height requirements) set forth in the Zoning Ordinance for the "I" District.

The City formally evaluated the proposed project's consistency with the General Plan and the Zoning Ordinance. The Hayward City Council determined that the project would be consistent with the General Plan and was an appropriate use for the Industrial Corridor. The City Council passed a resolution stating these findings on July 10, 2001 (Hayward City Council, 2001). The City had previously evaluated the appropriateness of the relocation site for the radio broadcast towers based on the General Plan and zoning ordinance. The City determined that the radio transmitter facilities were an appropriate use for the proposed relocation site and approved a Mitigated Negative Declaration and Conditional Use Permit for the relocation of these facilities in May 2001.

The City of Hayward is currently in the process of preparing a comprehensive revision to its General Plan. This revision is expected to be completed in December 2001. As part of the General Plan revision process, the City staff prepared a series of background reports for the City Council and Planning Commission. One of these reports, entitled "The New Economy and the Transformation of the Industrial Corridor," specifically addressed issues and trends in the Industrial Corridor (City of Hayward, 2001). This report indicates that the Industrial Corridor has experienced a change toward more intensive land uses in recent years and that this trend is expected to continue into the future. Relatively low intensity industrial uses, such as warehouses, may convert to more intensive office or research space, and land-

intensive uses, such as wrecking yards and trucking terminals, may be redeveloped with more intensive uses with higher employee densities. In order to capitalize on these trends for the benefit of the City's economic development, the report suggests that the City should consider changes to its general plan policies to encourage an information-based economy rather than a manufacturing-based economy. The report indicated that City might also need to revise its zoning regulations, such as parking requirements, to better accommodate office, research, and high-tech uses.

The proposed project also appears to comply with the minimum design and performance standards applicable to the construction of industrial buildings in the "I" District. Some of these standards are subject to interpretation (e.g., "design elements that are harmonious and in proportion to one another") and others involve details not specifically presented in the AFC (e.g., container size of trees used in landscaping). A condition of certification (**LAND-1**) has been proposed to ensure the project's compliance with the City's industrial design and performance standards. For those standards subject to interpretation, it should be noted that the City of Hayward has endorsed the design of the project proposed by the applicant and, therefore, the project presumably conforms to the architectural design principles included in the "I" District's design and performance standards. For a discussion of the project's effects on views and aesthetic resources, please see the **VISUAL RESOURCES** section of this FSA.

The proposed project site currently consists of two land parcels. In order to avoid the construction of buildings across property lines and to ensure compliance with the provisions of the Zoning Ordinance, a condition of certification (**LAND-2**) has been proposed to require the merger of these parcels into a single parcel.

Given the proposed project's consistency with the City of Hayward's applicable land use LORS, impacts would be less than significant if conditions of certification **LAND-1** and **LAND-2** are implemented.

C. Habitat /Natural Community Conservation Plans

There are several sensitive natural resource areas in the general vicinity of the project site, including Cogswell Marsh, the Hayward Area Recreation District (HARD) marsh, and the Hayward Regional Shoreline (see the **BIOLOGICAL RESOURCES** section for more information). However, there are no adopted habitat conservation plans or natural community conservation plans in the vicinity of the proposed project site. Therefore, the proposed project would not conflict with any such plans.

CUMULATIVE IMPACTS

The proposed project is consistent the City of Hayward's long-range land use policies for the Industrial Corridor as expressed in the General Plan. Conformance with the General Plan is the primary consideration is determining a project's potential to contribute to adverse cumulative land use impacts. The General Plan sets forth the City's long-range vision for the physical development of the city and other plans for infrastructure and public services are based on this long-range vision. Therefore,

projects that are consistent with the City's long-range land use policies are not viewed as adverse from a cumulative impact perspective. Because the project is consistent with the City's long-range planning policies for industrial development in this area, cumulative land use impacts are not considered significant.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information indicating that a minority population greater than fifty percent exists within a six-mile radius of the proposed RCEC project (please refer to **SOCIOECONOMICS Figure 1** in this FSA), and Census 1990 information that shows the low-income persons constitute less than fifty percent of the population within the same radius. Based on the land use analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project and, therefore, there is no environmental justice issue related to land use for this project.

RESPONSES TO PUBLIC AND AGENCY COMMENTS

EAST BAY REGIONAL PARK DISTRICT

EBRPD(8-8)-5 *"The District is concerned with potential significant impacts on parklands from the proposed project. In particular, the potential impacts include but are not limited to, the following: ...Land Use = parkland usage."* The comment is not specific in expressing how the RCEC project might affect parkland usage. The nearest parkland to the proposed RCEC site is the Hayward Regional Shoreline located west of the project site on the shore of San Francisco Bay. The RCEC site is not located adjacent to the Hayward Regional Shoreline, but it is located in close proximity. The Hayward Regional Shoreline consists of salt, fresh, and brackish water marshes and seasonal wetlands. Facilities at the park include the Shoreline Interpretive Center (approximately 0.7 miles to the southwest), a large marsh restoration project, and the San Lorenzo Trail. From a strict land use perspective, the RCEC should have no adverse impacts on the Hayward Regional Shoreline. As an industrial use, it would be similar to existing nearby uses in the Industrial Corridor and would be consistent with the industrial character of the immediate area. However, the **VISUAL RESOURCES** section of this FSA has identified a significant impact associated with the project could adversely affect views from within the Hayward Regional Shoreline. Additionally, concerns have been expressed that the characteristics of the project might result in adverse effects to local wildlife. Please see the **VISUAL RESOURCES** and **BIOLOGICAL RESOURCES** sections of this FSA for discussions of these issues.

EBRPD(8-8)-10 *"The District is also concerned with the potential significant impacts of the radio tower relocation on the Hayward Shoreline facility. Because the tower relocation is a critical part of the Russell City Energy Center's proposed project, we believe that its environmental impacts need to be considered as part of the proposed project as a whole, rather than in a piece-meal manner."* The environmental effects of the radio tower relocation were addressed in an Initial Study and Mitigated Negative Declaration adopted by the City of Hayward in May 2001 prior to approval of a Conditional Use Permit for the radio tower location. It is Staff's understanding that the

relocation of the tower was to make way for the power plant project, making the relocation part of the "whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably forseeable indirect physical change" for purposes of the CEQA analysis. (See CEQA Guideline Section15378.)

CITY OF HAYWARD

CITY(7-27)-4 *"Although the City has approved the land use and the General Plan consistency for the RCEC, and has approved a mitigated negative declaration for the relocation of radio antennas, the developer must secure necessary permits from applicable state and federal agencies and perform the relocation work in accordance with all requirements."* Staff concurs with this comment. Throughout this FSA, conditions of certification have been recommended to ensure that the RCEC project complies with applicable permit requirements of other agencies. However, staff does not believe that the Energy Commission should be responsible for ensuring that the applicant secure necessary permits for the relocation of the radio towers. The Energy Commission has no approval authority related to the relocation of the radio towers. The City has already approved a Conditional Use Permit for the relocation of the radio towers and imposed appropriate conditions through that approval.

"The subject of plant decommissioning is lightly treated in the application. The only reference indicates that the plant will be decommissioned if the cessation of operations becomes permanent. There is no definition of what "permanent" means or who determines that. This leaves the decision at the sole discretion of the owner/operator. The operator could cease operations for a period of 5, 10 or 20 years and not make the determination that it is a "permanent" cessation of operations. As there are no requirements for how a plant will be "decommissioned" during such a period, the plant could become a blighting influence on the shoreline and the industrial district. A plan for appropriate "decommissioning" and eventual demolition of the project, including timelines, should be part of the conditions of approval." At some unspecified time 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 planned operational life of the RCEC project is 30 years (Calpine/Bechtel, 2001a). At least twelve months prior to the initiation of decommissioning, the project owner will be required to prepare a Facility Closure Plan for Energy Commission review and approval. At the time of closure, all applicable LORS will be identified and the closure plan will 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 for which the applicant would have to comply in the event of unexpected temporary closure or unexpected permanent closure of the RCEC.

CONCLUSIONS AND RECOMENDATIONS

The project would not physically divide an established community, would not conflict with any applicable land use plan, policy, or regulation, and would not conflict with any applicable habitat conservation plan. The proposed use would be consistent with the policies of the City of Hayward's General Plan, and is considered a primary use

permitted in the "I" District of the Zoning Ordinance. The project appears to conform to the development standards for the "I" District and such conformance can be assured with the implementation of recommended condition of certification **LAND-1**. Therefore, the project's land use impacts are either less than significant or can be readily mitigated to a less-than-significant level.

Condition of certification **LAND-2** would require the merger the two parcels that constitute the RCEC project site in order to avoid the construction of buildings across property lines and to ensure compliance with the Zoning Ordinance.

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the minimum design and performance standards for the Industrial (I) District set forth in the City of Hayward Zoning Ordinance (Section 10-1.1645).

Verification: At least 30 days prior to construction of the RCEC project, the project owner shall submit written evidence to the Energy Commission Compliance Project Manager (CPM) that the project conforms to all applicable design and performance standards for the Industrial (I) District set forth in the City of Hayward Zoning Ordinance (Section 10-1.1645). The submittal to the CPM shall include evidence of review by the City.

LAND-2 The project owner shall adjust the lot line between the two parcels that constitute the RCEC project site in order to establish the RCEC and AWT project sites in accordance with provisions and procedures set forth in the City of Hayward's subdivision ordinance.

Verification At least 30 days prior to construction of the RCEC project, the project owner shall submit evidence to the Energy Commission Compliance Project Manager (CPM) indicating approval of the lot line adjustment by the City of Hayward. The submittal to the CPM shall include evidence of compliance with all conditions and requirements associated with the approval of the lot line adjustment by the City.

REFERENCES

Calpine/Bechtel Joint Develpment. 2001a. Application for Certification for Russell City Energy Center. May.

Calpine/Bechtel Joint Development. 2001b. Responses to the California Energy Commission Staff Data Requests on the Russell City Energy Center (01-AFC-07). August.

City of Hayward. 1986 (as amended). General Policies Plan.

City of Hayward. 1993 (as amended). Growth Management Element.

City of Hayward. 1999. Zoning Ordinance. September.

City of Hayward. 2001. Agenda Report: The New Economy and the Transformation of the Industrial Corridor. February.

Department of Finance. 2001. E-1 Report, City/County Population Estimates with Annual Percent Change, January 1, 2000 and 2001.

Hayward Area Shoreline Planning Agency (HASPA). 1993. Hayward Area Shoreline Planning Program – A Shared Vision.

Hayward City Council. 2001. Resolution No. 01-104. Resolution Finding the Russell City Energy Center Power Plant Use is Consistent with the General Plan and Zoning Ordinance. July 10.

NOISE AND VIBRATION

Testimony of Brewster Birdsall

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant operation or of construction practices, such as pile driving. The ground-borne energy of vibration has the potential to cause annoyance and, if extreme, structural damage.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the Russell City Energy Center (RCEC) and associated Advanced Water Treatment (AWT) plant (01-AFC-7), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

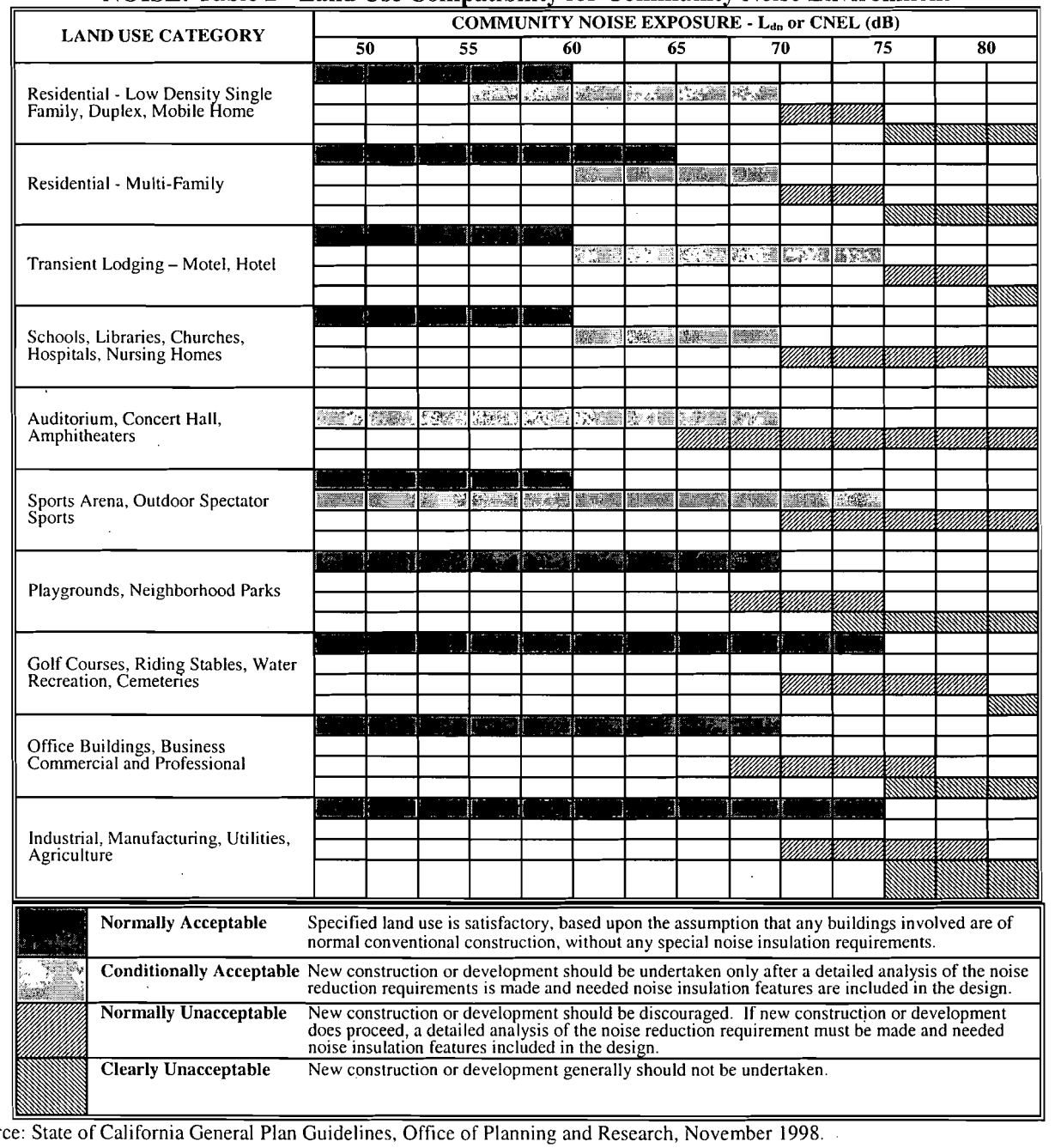
There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA 1995) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code Section 65302(f) encourages each local government entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in **NOISE: Table 2**.

NOISE: Table 2 - Land Use Compatibility for Community Noise Environment



Source: State of California General Plan Guidelines, Office of Planning and Research, November 1998.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards (DHS 1977). The Model also contains a definition of "pure

tone" based upon one-third octave band sound pressure levels, which can be used to determine whether a noise source contains significant pure tone components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by 5 dBA.

Other State LORS include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

California Environmental Quality Act

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., Title 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

a) exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

d) a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project....

The Energy Commission has interpreted the CEQA criteria such that noise produced by the permitted power-producing facility that causes an increase of more than 5 dBA in the background noise level (L_{90}) at a noise sensitive receiver during the quietest hours of the day is considered a significant effect.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. The construction activity is temporary,
2. Use of heavy equipment and noisy activities is limited to daytime hours, and
3. All feasible noise abatement measures are implemented for noise-producing equipment.

Cal-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

LOCAL

Hayward Municipal Code

The City of Hayward maintains a municipal ordinance that protects the community (including any portion of a neighborhood) from loud or disturbing unnecessary noises. Section 4-1.03 of the City Code generally prohibits any repeated or persistent noise that disturbs the peace and quiet of persons in the City. Construction noise affecting residential uses is specifically limited to no more than 6 dB above local ambient levels during nighttime hours (between 7:00 p.m. and 7:00 a.m. Monday through Saturday, or, on Sunday and holidays, before 10:00 a.m. or after 6:00 p.m.). Emergency activities are not subject to this rule.

Hayward Noise Element

The Noise Element Policies Document adopted by the City of Hayward in 1977 recognizes the state-level goals of managing new and existing sources of community noise. The adopted noise-related programs direct the City to evaluate land use compatibility with significant noise sources and to provide buffers between sources and noise-sensitive uses.

The standards in the City of Hayward Noise Element are similar to those of the state land use compatibility guidelines. The City's planning efforts aim for the maximum day-night outdoor noise levels shown in **NOISE: Table 3**.

NOISE: Table 3 – Hayward Noise Element: Maximum Permissible Noise Levels

Land Use Category	Maximum Noise Level, dBA (L_{dn})
Residential	55
Playgrounds, Neighborhood Parks	70
Offices, Commercial	70
Industrial, Manufacturing, Utilities	75
Source: City of Hayward, Noise Element.	

SETTING

The RCEC project involves the construction and operation of a new natural-gas fired combined-cycle power plant, rated at 600 MW nominally. The power plant will consist of two combustion turbine generators (CTGs), each with heat recovery steam generators (HRSGs) incorporating duct burners, a steam turbine generator (STG), mechanical draft cooling tower, and associated support equipment. A new 230 kV switch yard and 1.1 mile transmission line will be included at the site to join the power plant to PG&E's Eastshore Substation. Additionally, an Advanced Wastewater Treatment (AWT) plant will be constructed to provide treated water for makeup to the power plant's cooling and process water systems. The RCEC, including the switchyard and AWT plant, would occupy approximately 14.7 acres of industrial-zoned land directly south of the existing City of Hayward Water Pollution Control Facility.

Construction of the project is anticipated to require 18 to 21 months. During this period, all construction of the power plant, the AWT plant, and other facilities, including off-site linear facilities, would be completed. Removal of the existing radio transmitters is addressed by another environmental document to be prepared by the City of Hayward. Peak construction noise levels would occur during site clearing and construction site clean-up, and intermittent peak noise levels would occur during pile driving for the plant foundation and steam blows for preparing the steam lines.

The project equipment that has the greatest potential to generate significant noise levels during plant operation includes the air inlet to each combustion turbine, each generator, HRSG exhaust flues, the gas compressor, and the fans associated with the condenser and cooling towers.

EXISTING LAND USE

Power Plant Site

The project site is within the City of Hayward, Alameda County, just south of existing Water Pollution Control Facility. Land uses surrounding the project site are either industrial or open space and are generally not sensitive to new sources of industrial noise. According to the Land Use Section of the AFC (Section 8.6.1.2), the nearest residences to the RCEC are at least 0.8 miles from the project site, within the Hayward and Alameda County Industrial zones on the western edge of the Mt. Eden residential area. Open space and recreational uses are to the south and west, including the Hayward Regional Shoreline Park and the Shoreline Interpretive Center. The Shoreline Interpretive Center is approximately 0.73 miles from the project site, to the southwest, near the entrance to the Hayward-San Mateo Bridge (State Route 92). These residential areas, and to a lesser extent the recreational uses, would be somewhat sensitive to new noise.

Linear Facilities

Project linear facilities include electricity transmission, natural gas supply, water supply and wastewater discharge. New overhead transmission lines will connect the plant's on-site 230 kV switchyard to the Eastshore Substation via PG&E's existing 115 kV transmission corridor approximately 600 feet from the site. The natural gas supply line would be approximately 0.9 miles in length, primarily along Enterprise Avenue, and water connections would be between 100 and 2000 feet in length to various connections at the Hayward WPCF. None of the linear facilities would pass near sensitive land uses. No other off-site facilities would be necessary.

EXISTING NOISE LEVELS

In order to determine the current noise levels and estimate the noise effects of the project on adjacent sensitive receptors, the applicant commissioned ambient noise surveys of the area. The surveys were conducted at five locations over a 25-hour period in February 2001. The noise surveys were conducted using Larson-Davis sound level meters, with Bruel & Kjaer microphones, meeting the requirements of the American National Standards Institute (ANSI) for Type 1 sound level measurement systems. The measurements were performed at heights of approximately five feet above ground level to simulate the average height of the human ear (AFC § 8.7.1.1).

The applicant's noise survey monitored existing noise levels at one industrial location adjacent to the project site, two recreational locations, and at two of the nearest residences:

1. Adjacent to northern site boundary, outside of Water Pollution Control Facility.
2. Nearest residence (2773 Depot Road), near Industrial Boulevard.
3. Multiple-family residences (25800 Industrial Boulevard), near Depot Road.
4. Hayward Shoreline Interpretive Center, near Hayward-San Mateo Bridge.
5. Hayward Shoreline Nature Trail (footbridge at Cogswell Marsh), approximately 1.12 miles west of the project site.

NOISE:Table 4 summarizes the ambient noise measurement results (AFC, Table 8.5-3).

NOISE: Table 4 - Summary of Ambient Measured Noise Levels

Site ID	Location	Sound Level, dBA			
		L_{dn}	CNEL	Average Nighttime L_{50}	Average Nighttime L_{90}
1	Northern Site Boundary	66.0	66.3	58.9	58.1
2	2773 Depot Road	66.0	66.3	49.9	45.8
3	25800 Industrial Boulevard	68.8	69.1	53.7	49.5
4	Shoreline Interpretive Center	65.7	66.0	55.1	51.2
5	Shoreline Nature Trail	56.7	57.0	47.3	44.5

At the nearest residences near Depot Road and Industrial Boulevard, the existing noise levels depend on the exposure of the receptor in relationship to traffic on Depot Road or Industrial Boulevard. The existing day-night noise levels at these residences currently exceed the maximum permissible level of 55 dBA L_{dn} specified in the Hayward Noise Element. Late-nighttime noise levels at these locations ranged from a low of approximately 41 dBA at Location 2 to the 45 to 50 dBA range for Location 3. The noise patterns depend mostly on the nearby traffic. At night, industrial noise (e.g. fan noise) is audible at either of these locations. Between the hours of 10:00 p.m. and 6:00 a.m. the average L_{90} at Location 2 was 45.8 dBA.

IMPACTS

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
NOISE – Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b) Exposure of persons to or generation of excessive ground borne vibration noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the area to excessive noise levels?				X

DISCUSSION OF IMPACTS

Construction Noise

A. Noise in Excess of Standards or Ordinances

Construction noise is a temporary phenomenon. In this case, the construction period for the RCEC will extend for a duration of 18 to 21 months. This would include concurrent construction activity for the power plant and the AWT plant. The applicant identifies five general phases of construction activities, from site clearing through plant fabrication and initial steam blows. Construction of a major industrial facility such as a power plant would typically cause noise levels above those considered permissible by community policy. As a result, construction noise during certain hours

of the day is usually allowed to occur through exemptions provided by city ordinances. The City of Hayward allows construction noise provided that it does not exceed 6 dB above the local ambient conditions between 7:00 p.m. and 7:00 a.m. Monday through Saturday, or, on Sunday and holidays, before 10:00 a.m. or after 6:00 p.m. This generally allows daytime construction noise to occur provided it is not unnecessary and unreasonable.

The five construction phases would be 1) excavation, 2) concrete pouring, 3) steel erection, 4) mechanical, and 5) cleanup. The most intense noise sources would occur during pile driving activities (during the first phase) and steam blowing (during the last phase). During each phase, a variety of equipment would be used. This would include heavy earthmoving equipment, haul trucks, rail deliveries, cranes, construction worker vehicles, pneumatic tools and hammers.

The applicant has prepared analyses of construction noise impacts, listing the loudest equipment to be used in each phase and the predicted worst-case noise levels at the site boundary and the noise sensitive receptors (including residences and recreational areas) identified above. The applicant has estimated construction noise levels in a very conservative manner (without inclusion of attenuation provided by intervening buildings and other natural obstructions).

Without pile driving or steam blowing, the predicted worst-case average hourly noise levels during each of the five phases would range from approximately 38 to 49 dBA at the nearest noise sensitive receptors and from approximately 41 to 52 dBA at the Shoreline Interpretive Center. (Pile driving activities and steam blowing are discussed below.) This means that general construction noise at the residential and recreational receptors would not exceed the existing ambient noise levels. Existing daytime L_{eq} and L_{90} values presented by the applicant (Figures 8.7-3 through 8.7-7) at the nearest residential and recreational uses are above 50 dBA. Since the noise levels caused by general construction would not exceed existing ambient conditions, the cumulative effect of general construction noise to the community in conjunction with existing noise levels would be less than significant.

The applicant anticipates conducting construction activities between the hours of 6:00 a.m. and 6:00 p.m. Monday through Saturday. Towards the end of project construction, certain critical construction activities associated with plant startup could continue 24 hours per day on any day of the week. Limitations on the hours of construction proposed by the applicant could be necessary in order for the project to conform with the City of Hayward Municipal Ordinance. These limitations and further measures to ensure resolution of noise complaints would reduce any potential impacts. Noise effects from construction would be reduced through the implementation of proposed Conditions of Certification **NOISE-1**, **NOISE-2**, and **NOISE-8**.

Pile Driving Noise

Pile driver noise is impulsive, consisting of repeated impacts of a trip hammer on the piling, and can be particularly annoying. The noise levels predicted for pile driving are

best compared to the maximum noise levels observed in the ambient noise environment.
The applicant specifically assessed the noise impact from pile driving. The applicant calculated the noise level from pile driving and found that at the nearest residences the noise levels would be similar to the noise levels created by existing traffic. The applicant has not proposed to mitigate the noise generated from pile driving. Because pile driving will produce a noise that can be particularly annoying at the nearest residential receptors, Energy Commission staff proposes that pile driving be performed only during daytime hours in order to minimize annoyance to residents (see proposed Condition of Certification **NOISE-8** below). With this limitation, pile driving noise would comply with City of Hayward requirements.

Because construction activities are limited to daytime hours and certain noise levels by the proposed Conditions of Certification, and are of limited duration, noise impacts to receptors in the RCEC project area from pile driving are considered to be less than significant.

Steam Blows

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. As proposed by the applicant, high-pressure steam would then be raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, would be quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, would be performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line would finally be connected to the steam turbine, ready for operation. This type of high-pressure steam blow was proposed by the applicant (AFC pp. 8.7-16 through 18).

These high-pressure steam blows could produce noise as loud as 136 dBA at a distance of 50 feet. In order to reduce disturbance from steam blows, the steam blow piping could be equipped with a temporary silencer that would reduce noise levels by 20 to 30 dBA. Use of a silencer was proposed by the applicant. However, staff has identified additional measures that would be feasible.

In recent years, a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam over a continuous period of 36 hours or so. Resulting noise levels reach only about 86 dBA at 50 feet; noise levels at nearby receptors would be approximately 40 dBA, less than the ambient background noise levels, and thus

barely noticeable. Even more recently, compressed air has been substituted for steam in the continuous blow process, and the resulting noise levels are similarly low. In order to minimize annoyance due to this activity and to require use of feasible abatement measures, staff proposes Conditions of Certification to limit noise from steam blows by prohibiting the use of high-pressure steam blows unless appropriately silenced and to implement a notification process to make neighbors aware of impending steam blows (see proposed Conditions of Certification **NOISE-4** and **NOISE-5** below). This would ensure that noise from the process is minimized with feasible abatement.

Linear Facilities

This project includes new off-site linear facilities in the form of new electricity transmission, natural gas supply, water supply and wastewater discharge lines. The transmission line would follow PG&E's existing transmission corridor, approximately 600 feet from the site, and much of the new natural gas supply line would be constructed within Enterprise Avenue. None of the linear facilities would pass near sensitive land uses, except the new gas pipeline which would be approximately 1,000 feet from the nearest residential receptors. No other off-site facilities would be necessary.

Potential noise effects would be primarily the result of heavy equipment use when erecting the overhead transmission line towers or excavating and filling the trenches for the gas and water lines. The applicant has estimated that typical heavy construction equipment used for the transmission line and pipeline construction will produce noise levels of about 80-91 dBA at a distance of 50 feet. Additionally, transmission line tower placement may be aided by the use of a helicopter (AFC, Section 8.7.2.2). The work is expected to proceed in a sequential fashion, without producing construction noise in any given area for a substantial length of time.

Noise levels in the project area would increase during this phase of construction. These increases would be perceptible, especially for residences nearest the new gas pipeline. Because construction noise from linear facilities would be temporary and would be limited to daytime hours, the effects would not be significant.

Based upon the potential noise impacts of construction noise, the Energy Commission staff has recommended the inclusion of three Conditions of Certification (**NOISE-1**, **NOISE-2**, and **NOISE-8**) to monitor and mitigate potential construction noise impacts.
Because linear facility construction activities are limited to daytime hours and certain noise levels by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the RCEC project area are considered to be less than significant.

Worker Effects

The applicant acknowledges the need to protect construction workers from noise hazards. The applicant recognizes those applicable LORS that would protect construction workers, and commits to complying with them (RCEC, AFC § 8.7.5.1).

To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

Operational Noise

The applicant has incorporated noise reduction measures into the design of the project to ensure that there will not be a substantial increase in noise levels due to operation of the RCEC power plant or AWT. Attaining compliance with the LORS (the City of Hayward Municipal Code and Noise Element) would be consistent with the established Energy Commission policy of limiting increases in noise exposure to no more than 5 dBA, to prevent a significant increase in background noise levels.

Power Plant Operation

During its operating life, the RCEC represents essentially a steady, continuous noise source day and night. Occasional short-term increases in noise levels would 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 maintenance, noise levels would decrease.

The primary noise sources anticipated from the facility include the air inlet to each combustion turbine, each generator, HRSG exhaust flues, the gas compressor, and the cooling tower exhausts. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The applicant performed acoustical modeling calculations to predict the facility noise emissions and to identify design features that would reduce or attenuate equipment noise. The calculations for the proposed equipment were based on noise data obtained by the applicant on similar equipment in actual operation at other combined cycle power plants (AFC, §8.7.2.3). The modeling was performed as an iterative process to identify appropriate noise reduction measures. The results of the acoustic modeling, including the effects of noise reduction measures specified by the applicant, are presented in

NOISE: Table 5 and NOISE: Table 6.

NOISE: Table 5 – Summary of Predicted Nighttime Noise Levels

Measurement Sites	Nighttime Sound Level, dBA			Increase Caused by Project, dBA
	Ambient (L_{90})	Project (L_{eq})	Cumulative (L_{eq})	
1	58.1	68*	68	+ 9.9
2	45.8	44	48	+ 2.2
3	49.5	42	50	+ 0.5
4	51.2	48	53	+ 1.8
5	44.5	40	46	+ 1.5
* - Energy Commission staff estimate, based on AFC Figure 8.7-8.				

NOISE: Table 6 – Summary of Predicted Day-Night Noise Levels

Measurement Sites	Day-Night Sound Level, dBA			Hayward Noise Element Goal
	Ambient (L_{dn})	Project (L_{eq})	Cumulative (L_{dn})	
1	66.0	68*	74.6	75
2	66.0	44	66.1	55
3	68.8	42	68.8	55
4	65.7	48	66.0	70
5	56.7	40	57.1	70
* - Energy Commission staff estimate, based on AFC Figure 8.7-8.				

Because of the substantial distance from the RCEC to the nearest residential or recreational land use (Locations 2-5), the results of the modeling calculations, without assuming any special or upgraded noise controls, revealed that residential and recreational receptors would not experience noise from RCEC above the existing background noise levels. To reduce plant noise to below the permissible levels for neighboring industrial uses, the applicant has identified the following additional noise control features. Specific noise reduction measures included with the project include:

- Acoustical cladding on the south and east sides of the STG support structure
- Attenuated HRSG burner control skis
- Acoustically lagged gas lines and throttling valves on the HRSG
- Noise barrier wall on the south side of the circulating water pumps
- Low noise gas compressor building with masonry construction

With the above measures, the operational noise level at the northern plant boundary (Location 1) is predicted to be approximately 68 dBA L_{eq}. This is an area of adjacent industrial uses. On the northern site boundary, existing ambient noise levels are approximately 66 L_{dn} (or 60 dBA 24-hour L_{eq}) and nighttime noise levels are 58.1 dBA L_{90}. The project would add a steady state noise source of approximately 68 dBA L_{eq} at this location. With project noise, nighttime noise levels at the northern plant boundary would increase by nearly 10 dBA. Because this is not a sensitive location (where sleep interference would be a concern), the change in the noise environment caused by the project is compared to the Hayward Noise Element permissible noise level of 75 L_{dn} for industrial uses. Compared to the existing 24-hour L_{eq} of 60 dBA at this location, the plant would add 68 dBA L_{eq}. The resulting cumulative noise level outside the northern plant boundary would be dominated by the plant noise at 68 dBA L_{eq}, or approximately 74.6 L_{dn}. Because this noise level would not exceed the permissible maximum noise level of 75 L_{dn} specified in the Hayward Noise Element, the project effects would be in compliance with the LORS.

The operational noise level caused by the project at the nearest residential receptor (Location 2) is predicted to be 44 dBA. The existing day-night noise levels at the residences currently exceed the maximum permissible level of 55 L_{dn} specified in the Noise Element. During daytime hours, traffic noise on the nearby streets and highways would mask the more distant plant noise such that the plant noise would be inaudible. At night however, plant noise would combine with existing ambient noise to cause a cumulative nighttime noise level of 48 dBA. This level is less than

5 dBA above the existing nighttime ambient noise level and not a significant increase.
The operational noise level caused by the project at the nearest recreational receptor (Location 4) is predicted to be 48 dBA. During daytime hours, plant noise would not exceed existing noise levels. When added to the assumed nighttime ambient noise level of 51 dBA, the cumulative noise level will be 53 dBA. This level is less than 5 dBA above the ambient noise level, and would be in compliance with the LORS.

Based upon the above information, it is the opinion of the Energy Commission staff that operation of the project will comply with the LORS, and will ensure that there will be no significant change in noise levels. Because the cumulative noise levels will not exceed the noise standards of the Hayward Noise Element, and would not cause an increase of more than 5 dBA above the existing ambient noise level at sensitive receptors, the noise due to RCEC is not expected to have a significant noise effect on the local noise environment. Proposed Conditions of Certification **NOISE-2** and **NOISE-6** would further reduce noise effects.

Tonal and Intermittent Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The applicant summarized the tonal components of typical combined cycle power plants in the AFC (AFC, p. 8.7-15, Table 8.7-2). Because of the distance to the nearest residential receptors, special provisions will not likely be necessary to mitigate tonal noise during the operation of the project (AFC, p. 8.7-20).

Tonal noises are commonly generated by rotating equipment. Noise from fans that may be exposed to the outside for efficiency purposes might only be partially shielded by a fan enclosure. Should tonal noise occur during project operation, proposed Condition of Certification **NOISE-6** would require that the tonal noise be eliminated.

Pressure relief valves will likely be installed on the HRSG. Emergency pressure safety valve (PSV) discharges are typically not silenced, and produce noise only under emergency conditions. The applicant has not provided an estimate of the noise levels associated with the steam system vents at the nearest receptors, but the applicant has committed to installing vent silencers with reasonable performance to mitigate tonal noise from pressure relief. Given the distance of the site from the nearest residential areas, the intermittent noise effects of these sources are expected to be insignificant, and additional monitoring is not recommended.

Linear Facilities

New off-site linear facilities proposed as part of this project include the new transmission line to the Eastshore Substation. Noise from the transmission lines will include a corona discharge hum. Corona-associated noise depends on the voltage of the transmission line, the diameter of the conductor, and the condition of the conductor and suspension hardware. During rainy conditions, when the conductors

are wet, corona noise is at its highest. Other water and gas pipeline linear facilities would not cause noise during operation.

The applicant has evaluated corona-associated noise caused by the existing lines around the Eastshore Substation in their present location and under project conditions with the RCEC online and the proposed improvements to the transmission corridor between the RCEC and the Eastshore Substation (AFC, §6.4.2.3 and Supplement for Data Adequacy). The existing 115 kV transmission line east of the project site is centered approximately 30 feet east of the centerline of the 145 foot wide right-of-way. On the eastern edge of the right-of-way, the existing maximum corona-associated noise level was estimated to be 46.2 dBA. The project would provide new transmission towers located at the center of the right-of-way carrying the new 230 kV line with the existing 115 kV line. The ground clearance of the sag in the lowest line (115 kV at 30 feet) would not change with the project. On either edge of the right-of-way, with the new transmission lines in operation, the resulting noise level would be 46.7 dBA between the RCEC and the Eastshore Substation. No change in audible corona-associated noise would occur on other segments of the transmission grid around the RCEC or Eastshore Substation. Because corona noise would increase approximately 0.5 dBA and there are no noise sensitive land uses near the substation or the transmission lines, the noise impacts that would occur from linear facilities would be insignificant.

Worker Effects

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (AFC § 8.7.5.1). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. The applicant would implement a comprehensive hearing conservation program. To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7**.

B. Excessive Vibration

Pile Driving Vibration

Conventional pile driving produces potentially significant ground-borne vibration. Although the applicant has not provided a specific analysis of potential pile driving vibration effects, it is the opinion of Energy Commission staff that pile driving in the vicinity of the RCEC project site will not have any effects on the nearest residential receptors, which are approximately 0.8 miles distant, and effects experienced by adjacent businesses would be less than significant.

Plant Vibration

Plant operation would not cause substantial ground-borne vibration beyond the site boundary. Within the site boundary, vibration would be carefully managed to protect the rotating components of the equipment in operation (AFC p. 8.7-14). Project-induced ground-borne vibration will not have any effects on the nearest residential

receptors, which are approximately 0.8 miles distant, and effects experienced by adjacent businesses would be less than significant.

C. Permanent Increase in Ambient Noise

Construction Noise

As described above, construction of the power plant is a temporary phenomenon; the construction period for the RCEC facility is scheduled to last between 18 to 21 months. As a result, noise generated from construction would not cause a substantial permanent increase in ambient noise levels.

Operational Noise

During the operating life, the RCEC facility will represent essentially a steady, continuous and broadband noise source, day and night. As discussed above, the noise levels from the proposed power plant were modeled to evaluate whether the new plant would contribute an incremental increase in noise levels at the nearest residential receptors. The predicted noise levels are shown in **NOISE: Table 5 and Table 6**. The predicted noise level at the closest residential receptor would be below the existing nighttime ambient conditions and the increase caused by the project would be less than 5 dBA. As a result, permanent noise increases associated with power plant operations would be considered less than significant. Staff recommends the implementation of the measures described in Condition of Certification **NOISE-6** to further reduce any potential impacts to the local community associated with operations.

Linear Facilities

As described above, all aboveground linear facilities (transmission lines) will not be located near noise sensitive receptors. Thus, there will be no noise impacts associated with linear facilities.

D. Substantial Temporary Increase in Noise Level

Construction Noise

General Construction Noise

Construction impacts are generally short-term in nature and usually result from the operation of heavy-duty diesel- and gasoline-powered construction equipment (e.g., backhoes, boom trucks, delivery trucks, compressors). As discussed above, maximum estimated noise levels at the nearest sensitive receptor from construction would range between 38 and 49 dBA, depending on the construction phase. These noise levels would be below the existing ambient noise levels at the sensitive receptors. As a result, temporary increases in noise levels due to construction would be considered less than significant. Staff recommends the implementation of the measures described in Conditions of Certification **NOISE-1**, **NOISE-2,** and **NOISE-8** to further reduce any potential for impacts to the local community associated with construction activities.

Steam Blows

The highest noise levels that would be generated during the construction of the RCEC facility as proposed by the applicant would be associated with steam blows. As described above, staff proposes Conditions of Certification to limit noise from steam blows by prohibiting the use of high-pressure steam blows unless appropriately silenced and to implement a notification process to make neighbors aware of impending steam blows (see proposed measures described in Conditions of Certification **NOISE-4** and **NOISE-5** below) in order to minimize annoyance to residents.

Linear Facilities

Construction of the off-site linear facilities will occur approximately 1,000 feet from the nearest residential receptors. This noise may be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction area. This work, however, is only a temporary phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days. As a result, temporary noise increases associated with construction of the linear facilities would be considered less than significant.

Operational Noise

As described above, the RCEC facility will represent essentially a steady, continuous noise source day and night. However, occasional short-term increases in noise levels 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 from maintenance, noise levels will decrease. It is anticipated that the short-term noise levels would not cause any significant temporary increase in noise levels.

E. Airport Noise Impacts

The RCEC is located approximately 1.5 miles south of the Hayward Executive Airport, a general aviation airport. In general, the RCEC area is not substantially affected by aircraft noise, and the RCEC would not include any receptors that would be sensitive to aircraft noise. Therefore, this criterion is not applicable to the proposed project.

F. Private Airstrip Impacts

The RCEC is located approximately 1.5 miles south of the Hayward Executive Airport, a general aviation airport. In general, the RCEC area is not substantially affected by aircraft noise, and the RCEC would not include any receptors that would be sensitive to aircraft noise. Therefore, this criterion is not applicable to the proposed project.

CUMULATIVE IMPACTS

Section 15130 of the *CEQA Guidelines* (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The *CEQA Guidelines* require that the discussion reflect

the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.
There are no planned projects that would contribute to cumulative noise impacts in the project study area identified in the AFC. There are industrial and municipal noise sources north and east of the project site that could contribute to the cumulative noise levels at receptors in that direction. The effects of noise produced by those sources have been accounted for by the ambient noise level measurements, and the resulting noise levels are described in the noise level predictions listed above.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is greater than fifty percent within a six-mile radius of the proposed RCEC (please refer to **Socioeconomics Figure 1** in this Staff Assessment), and Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Based on the **NOISE AND VIBRATION** analysis, staff has not identified unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no **NOISE AND VIBRATION** environmental justice issues related to this project.

FACILITY CLOSURE

In the future, upon closure of the RCEC, all operational noise from the entire RCEC site would cease, and no further noise impacts from operation of the plant would be possible. The remaining potential temporary noise source would be the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the RCEC, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that are in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

RESPONSE TO AGENCY AND PUBLIC COMMENT

East Bay Regional Park District Comments

Letter dated August 8, 2001:

EBRPD(8-8)-6: Noise: Parkland Usage... *The Park District is concerned about potentially significant noise effects on parkland visitors and wildlife. The Staff*

Assessment should adequately analyze the significant impacts from noise on the public and District employees and on animal species in the Hayward Regional Shoreline Park.

The Hayward Regional Shoreline Park would experience increased noise levels due to construction and operation of the RCEC. The existing conditions within the park were characterized by the applicant with ambient noise monitoring at Location 4 (Shoreline Interpretive Center) and Location 5 (Shoreline Nature Trail), as identified in **NOISE: Table 4**.

Because general construction activities would cause noise levels similar to or less than the existing daytime L_{eq} and L_{90} noise levels at the recreational uses, significant impacts on the public and District employees would not be anticipated. Pile driving and steam blows would cause higher, intermittent noise levels. The effects of noise from these activities would be reduced through a proposed complaint resolution process and a proposed notification process that would make the Park District aware of scheduled construction activities and steam blows (see proposed Condition of Certification **NOISE-1, NOISE-2, and NOISE-5** below).

During operation of the RCEC, noise levels at the property line of the RCEC would be limited to 69 dBA L_{eq}. This would provide project noise levels at the Shoreline Interpretive Center and Shoreline Nature Trail below those occurring in the existing conditions, as described in **NOISE: Table 5 and Table 6**. On shoreline land (approximately 500 feet from the property line of the RCEC), the noise levels caused by the power plant would be attenuated by distance to levels less than 64 dBA L_{eq}. This means that day-night noise levels caused by RCEC on shoreline land would be less than 70 L_{dn}, which would be consistent with City of Hayward Noise Element goals for "neighborhood parks" (see **NOISE: Table 3**), and the impacts of operational noise on the public and District employees on shoreline land would be less than significant.

The EBRPD is concerned about impacts on animal species within the park .... see the Biological Resources section of this Staff Assessment.

Public Comments: Frank and Janice Delfino

Letter dated December 28, 2001

What are the effects on nearby wildlife from project construction noise and vibration (pile driving) and operational noise (constant whine), and are there unusual sounds that may occur during startups?

See the Biological Resources section of this Staff Assessment for a discussion of the potential effects of pile driving and operational noise on wildlife. Measures to minimize pile driving noise are proposed in the Biological Resources section, and ground-borne impulse vibrations are discussed above. Due to their intermittent nature, ground shaking from pile driving attenuates rapidly between each impact (see also AFC p. 8.7-13). Measures to minimize pile driving noise by limiting the schedule of construction activities (see proposed Condition of Certification **NOISE-8**, below, and the Biological Resources section) would also be effective for managing coincident vibration. Operational noise that may cause a whine would be mitigated through proposed

conditions requiring the elimination of tonal noises (see proposed Condition of Certification **NOISE-6**). Startups cause transient noise especially from the steam system as it relieves pressure. The applicant has committed to vent silencers that would minimize these impacts (see AFC p. 8.7-20).

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that the RCEC will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the RCEC facility were designed as described above, and further mitigated as described below in the proposed Conditions of Certification, it is not expected to produce significant adverse noise impacts.

To ensure compliance with all applicable noise LORS, Energy Commission staff recommends adoption of the following proposed Conditions of Certification.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of ground disturbance , the project owner shall notify the City of Hayward, the Hayward Area Recreation District, the East Bay Regional Parks District, and residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

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

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (see Exhibit 1), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;

- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- If the noise is project related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and, if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of Hayward, 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 ground disturbance, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM the noise control program. The project owner shall make the program available to OSHA upon request.

NOISE-4 The project owner shall employ a low-pressure continuous steam or air blow process. High-pressure steam blows shall be permitted only if the system is equipped with an appropriate silencer that quiets steam blow noise to no greater than 86 dBA, measured at a distance of 50 feet. The project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.

Verification: At least 15 days prior to any low-pressure continuous steam or air blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam or air blow(s), the project owner shall notify the City of Hayward, the Hayward Area Recreation District, the East Bay Regional Parks District, and residents within one mile of the site of the planned activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam or air blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam or air blow activities, including a description of the method(s) of that notification.

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the project will not cause resultant noise levels to exceed the noise standards of the City of Hayward Municipal Code or Noise Element.

No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

Protocol:

Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct short-term survey noise measurements at monitoring sites 1, 2, 3, 4, and 5. The short-term noise measurements shall be conducted during both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods. The survey during power plant operation shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

If the results from the survey indicate that the noise level due to the project at monitoring site 2 exceeds 44 dBA L_{eq}, or that the noise standards of the Hayward Noise Element have been exceeded at monitoring sites 1, 4, or 5, mitigation measures shall be implemented to the project to reduce noise to a level of compliance with these limits.

If the post-construction noise survey indicates that pure tones have been introduced by plant operations, the project owner shall take any necessary corrective actions to eliminate the pure tones.

Verification: Within 30 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the CPM. Included in the post-construction survey 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-7 Within 30 days after the facility is in full operation, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise

exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Heavy equipment operation and noisy construction work shall be restricted to the times of day delineated below:

Monday-Saturday	7:00 a.m. to 7:00 p.m.
Sundays and holidays	10:00 a.m. to 6:00 p.m.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Russell City Energy Center Project
(01-AFC-07)

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).

REFERENCES

City of Hayward. 1977. Noise Element Policies Document, Planning Department, City of Hayward. Adopted: July 26, 1977.

City of Hayward. Nuisance Ordinance. Section 4-1.00. Amended 1986.

Federal Transit Administration. 1995. *Transit Noise and Vibration Impact Assessment.* DOT-T-95-16. Harris, Miller, Miller and Hanson, Inc. Burlington, Massachusetts.

Russell City Energy Center (RCEC), Calpine/Bechtel Joint Development, Application for Certification (AFC). Submitted to the California Energy Commission, May 22, 2001.

Russell City Energy Center (RCEC), Calpine/Bechtel Joint Development, Supplemental Information. Submitted to the California Energy Commission, June 19, 2001.

Russell City Energy Center (RCEC), Calpine/Bechtel Joint Development, Responses to the California Energy Commission Staff Data Requests. Submitted to the California Energy Commission, August 14, 2001.

State of California. 1998. *General Plan Guidelines.* Governor's Office of Planning and Research. November 1998.

State of California. 1977. *Model Community Noise Control Ordinance.* Department of Health Services (DHS), Office of Noise Control. April 1977.

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 (L_{eq}), 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 (L_{dn}) sound level measurement is similar to L_{eq}, 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 Average Sound Level, DNL or 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.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. 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.

PUBLIC HEALTH

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

Operating the Russell City Energy Center (RCEC) would produce combustion by-products and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The potential for significant public health impacts is addressed in this section in terms of cancer and non-cancer risks from routine operations while the potential for significant worker health impacts is addressed in the **Worker Safety and Fire Protection** section. The potential impacts of project-related electric and magnetic fields (EMF) are addressed in the **Transmission Line Safety and Nuisance** section.
The pollutants of specific concern in this regard are those for which no air quality standards have been established. These are known as non-criteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants and are assessed in the **Air Quality** section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following federal, state and local LORS were established to ensure protection against the health impacts of primary concern in this analysis.

FEDERAL

Clean Air Act of 1970 section 112 (42 U.S C., section 7412)

This section of the act requires that new sources, which emit more than 10 tons per year of hazardous air pollutants (HAPs) or more than 25 tons per year of any combination of HAPs be equipped with the Maximum Achievable Control Technology (MACT) for these pollutants.

STATE

California Health and Safety Code section 41700

This section of the code states that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage business or property."

The California Health and Safety Code section 39650 ET seq.

This section of the code mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to

control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in CARB's California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal-EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For non-cancer-causing toxic air pollutants, Cal-EPA established specific no-effects levels (known as reference exposure levels, or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk assessments.

California Health and Safety Code section 44300 ET seq.

This section of the code requires facilities, which emit large quantities of criteria pollutants and any amount of non-criteria pollutants to provide the local Air District an inventory of toxic emissions. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The CARB and the Air Quality Management District, which in this case is the Bay Area Air Quality Management District (BAAQMD), will ensure implementation of these requirements for the proposed project.

LOCAL

Bay Area Air Quality Management District Rule 2-1-316

To ensure compliance with California Health and Safety Code Section 44300 et seq., the Air District established this rule, which requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air pollutants in specified amounts. The applicant, Calpine/Bechtel Joint Development (or Calpine/Bechtel) has complied with this requirement.

SETTING

As detailed in the information from the applicant (Calpine/Bechtel 2001a, pages 8.6-2 through 8.6-7, and 8.9-1), the project site is within the City of Hayward's Industrial Corridor in an area of heavy industrial, commercial and office uses, with relatively few nearby residences. The nearest of such residences is approximately 0.82 miles to the northeast. To the south and west is open space together with land for recreational uses.

As with all urban areas, there are a large number of sensitive receptor locations within a six-mile radius of the project site as listed in the information from the applicant (Calpine/Bechtel 2001a, pages 8.9-3 through 8.9-5). These sensitive receptor locations include schools, hospitals, convalescent and nursing homes whose occupants are more sensitive than the general population to the biological impacts of environmental pollutants. It is because of such sensitivity that specific safety factors are incorporated into the applicable limits on human exposures.

METHOD OF ASSESSING THE POTENTIAL IMPACTS OF TOXIC AIR POLLUTANTS

Any toxic air pollution-related health risks from operating the proposed RCEC would mainly be associated with emissions from its natural gas-fired turbines. For the surrounding population, the cancer and non-cancer effects of such emissions are assessed from exposure estimates obtained from both air dispersion and exposure modeling. For the pollutants at issue, the potential for cancer is considered particularly important because of the present assumption by most scientists that there is no "safe" exposure to a carcinogen, meaning that every carcinogenic exposure is capable of a theoretical cancer risk. This non-threshold concept (as applied to carcinogenic effects) differs from present assumptions about non-cancer effects, which are assumed to result only after exposure above levels that overwhelm the body's ability to protect against such impacts. The procedure for such impact assessment is known as a health risk assessment, which consists of the steps listed below:

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

Health Effects Assessed

The types of air toxics-related health impacts of concern in this analysis are those that can result shortly after exposure or following long-term (or chronic) exposure. Those from short-term exposure are known as acute effects and generally result from exposure at relatively high levels. Some examples of pollution-induced non-cancer health effects from acute or chronic exposure include headaches, dizziness, coughing, nausea, asthma, skin rash, and irritation of any part of the body such as the eyes, throat and skin. According to present understanding, only those effects from chronic exposure are capable of causing cancer whose risk of manifestation increases with the level and duration of such exposure.

For the proposed or similar gas-fired facilities, high-level toxic exposures (at levels capable of acute effects) could occur only during major accidents, not during routine operations when emissions are much lower. Compliance with Air District-mandated emission control technologies is reflected by the incremental cancer and non-cancer risk estimates calculated for toxic pollutants. These risk estimates are calculated the same way for the proposed and other gas-fired power plant projects. Therefore, they can be used, despite underlying scientific uncertainties, to compare similar projects for compliance with the requirements for use of the best emission control technologies as currently identified by the ARB.

Estimating the Risk of Non-Cancer Effects

The method used by regulatory agencies to numerically assess the likelihood of acute or chronic impacts of air toxics or soil contaminants is the hazard index method. In this approach, a hazard index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source being considered. This index is calculated by dividing the exposure estimate by the applicable reference exposure level. After calculating the hazard indices for the individual pollutants, these indices are added together for all those that affect the same part of the body or target organ, to obtain a total hazard index for the source. Total hazard indices of 1.0 or less are regarded as indicating a potential lack of significant health impacts while an index of more than 1.0 may indicate a significant potential for the non-cancer acute or chronic effects being considered.

Estimating the Risk of Cancer

Since cancer is currently considered possible from every exposure to a carcinogen, staff considers the risk of cancer manifestation as more sensitive than the risk of non-cancer effects for assessing the environmental acceptability of a source of both carcinogens and non-carcinogens. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the risk of operations-related cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens to be emitted. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together to obtain the total incremental cancer risk from operations. Given the established conservatism in the this risk calculation process, these numerical estimates are best regarded as only representing the upper bounds on the cancer risk at issue. They should not be presented as the real risk, which will likely be lower and could indeed be zero. Since the same calculation process is used in all cases, these risk numbers are best used in practice for (a) setting mitigation priorities, (b) choosing between competing control technologies, and (c) assessing the effectiveness of control measures. The significance of any specific estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is mostly considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. The South Coast Air Quality Management District (SCAQMD) considers a risk of 25 in a million as the significance criterion in this regard. For projects with the Best Available Control Technology (BACT) for air toxics (T-BACT) the BAAQMD considers a risk of 10 in a million as its significance criterion.

The Energy Commission staff conducts its cancer risk assessments to establish whether the suggested cancer risk would be negligible or de minimis in terms of the

need for specific mitigation. In the first phase (which is the screening-level phase), calculations are made using conservative assumptions that tend to overestimate rather than underestimate the risk. If the estimate from this screening-level analysis were below one in a million, staff would regard the suggested risk as de minimis, or negligible and not warranting further analysis. If the estimate is above one in a million, a more refined analysis (using more site-specific and other more accurate assumptions) might be necessary to assess the need for specific mitigation. In such a refined analysis, staff would recommend specific mitigation only when the risk estimate is more than 10 in a million. This limit-based regulatory approach is intended in the present state of knowledge to limit the rate of addition to the already high (1 in 4, 25 %, or 250,000 in a million) background cancer risk of the average individual.

While the carcinogenic property of several environmental pollutants is well established, the causes of most of human cancers remain largely unknown. What has become clearer to scientists is that environmental pollution is responsible for only a small fraction of human cancers in general. This fraction, according to the South Coast Air Quality Management district (2000, page 2), represents only about two percent of cancer cases.

For non-carcinogenic pollutants, staff considers significant health impacts to be unlikely when the total hazard index is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective. It would not automatically call for specific mitigation whose recommendation would depend on the index value involved.

ANALYSIS OF IMPACTS

ENVIRONMENTAL CHECKLIST

PUBLIC HEALTH -- Would the project's toxic emissions expose the surrounding population to a significant risk of cancer and non-cancer effects during:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Construction			X	
b) Operation			X	

DISCUSSION OF IMPACTS

A) Construction

The construction-phase exposure of specific concern to staff is to the toxic PM10 emissions from diesel-fueled construction vehicles and equipment. The constituents of such emissions are capable of cancer and non-cancer effects in humans. The potential impacts of the companion criteria pollutants are addressed in the **Air Quality** section. Staff conducted a screening-level analysis from the toxics emission

information provided by the applicant for the diesel equipment to be used during the relatively short (18-month to 21-month) construction period (Calpine/Bechtel 2001a, Appendix 8.1). These emission levels were calculated by the applicant to reflect the effectiveness of the mitigation measures to be required by the Air Quality staff and BAAQMD for the project. The maximum chronic REL of 1.6 from staff's impact calculations does not suggest a significant risk of PM10-related non-cancer impact on any area residents whose nearest location would be 0. 82 miles away. Staff also calculated a maximum cancer risk of 0.0057, which staff considers negligible.

B) Operation

A screening level health risk assessment was conducted to estimate the maximum cancer and non-cancer risks that could be associated with the toxic pollutants of concern from project operations. These toxic pollutants have been identified by the applicant (Calpine/Bechtel 2001a, page 8.9-7 and 8.9-9) in terms of their potential for cancer or non-cancer effects. The cancer risk estimates from the employed analytical approach would represent only the upper bound on this risk. The actual risk would likely much lower and could indeed be zero. A cancer risk estimate of 0.174 in a million was calculated for all the project's carcinogens. A more refined analysis would likely yield a much lower estimate. This screening level estimates suggests that the project's cancer risk would be negligible being far less than the 10 in a million which staff considers as a trigger for recommending mitigation above the applied toxic-best available control technology or T-BACT. This means that staff considers the proposed emission controls measures as adequate for the project's operations-related toxic emissions of primary concern in this analysis. This risk estimate is also below both the 1 in a million that BAAQMD considers significant for projects such as this and the 10 in a million requiring public notification. T he only other operations-related cancer risk of potential significance is the cancer risk from operating the project's diesel-fueled emergency generator for which there are specific Air District risk minimizing control requirements. Compliance with related measures would be ensured through specific staff requirements in the **Air Quality** section.

A maximum chronic hazard index of 0.0216 was calculated for the project's non-carcinogenic pollutants considered together. Their acute hazard index was calculated to be 0.246. Both values are far below staff's 1.0 level of significance for the health effects involved.

CUMULATIVE IMPACTS

The relatively low cancer and non-cancer risk estimates for routine project operations suggest that the addition of its toxic emissions would be unlikely to significantly add to 0the area's average individual background risk of cancer or non-cancer health impacts. For the average individual, this background lifetime cancer risk is approximately 1 in 4 or 250 thousand in a million. Existing Air District and other regulatory Toxic Air Contaminant (TAC) control programs are intended to minimize the rate of specific additions to this background cancer risk.

ENVIRONMENTAL JUSTICE

The concern about environmental justice relates to the potential for disproportionate impacts on mostly minority populations either from a conscious effort to (a) cluster pollutant sources around minority areas or (b) employ less effective controls in nearby projects. As discussed above, any air toxics-related health impacts from operating the proposed project would be less than significant anywhere in the project area, suggesting that no effort was made to either site the project or control its emissions in ways that would significantly impact any discernible group of residents, whether minority or non-minority.

FACILITY CLOSURE

As previously noted in this analysis, the toxic pollutants of primary concern in this analysis are those from routine operation of the proposed project. During temporary or permanent project closure, the major concern would be over non-routine releases of hazardous materials or wastes on site. Such releases are discussed respectively, in the **Hazardous Materials** and **Waste Management** sections. Since project operations would be halted during forced, temporary closures, any hazardous material releases are unlikely to be in significant amounts. During permanent closure, the only emissions of potential significance would derive from demolition or dismantling activities and the equipment used. Such emissions would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

CONCLUSIONS AND RECOMMENDATIONS

Since (a) the effectiveness of the proposed pollution controls is reflected in the cancer and non-cancer risk estimates for the RCEC's toxic air pollutants of primary concern in this analysis, and (b) these risk estimates are far below their applicable levels of significance, staff considers the project as complying with the health LORS of concern in this analysis and does not recommend additional mitigation.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

The City of Hayward has expressed specific concern about the potential impacts of the proposed project's emissions on the health of individuals in area residences and community colleges. In addressing this concern for the toxic components of primary concern in this analysis, staff would point to the relatively low estimates of the potential cancer and non-cancer health effects at issue. These estimates show these project emissions as not posing a significant health hazard to any one in the project area.

Some area residents have expressed concern about the potential impacts of the project's pollutants on area wildlife. Staff would note in addressing this concern, that all humans are considered more sensitive than the experimental animal with the greatest sensitivity (to the biological effects of a toxicant), in establishing specific limits on the environmental levels of that toxicant. Staff has established the project's emissions as not posing a health hazard to exposed humans, meaning that the

pollutants in question would not pose a health hazard to any non-human species in the area (whether wildlife or domesticated).

REFERENCES

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

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

Calpine/Bechtel (Calpine/Bechtel Joint Development) 2001a. Application for Certification (01-AFC-7). Submitted to the California Energy Commission, May 22, 2001.

South Coast Air Quality Management District 2000. An Air Toxics Control Plan for the Next ten years. March 2000. South Coast Air Quality Management publication.

SOCIOECONOMICS

Testimony of Daniel Gorfain

INTRODUCTION

The technical area of Socioeconomics includes several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of potential short-term and long-term project-related population changes on local housing, schools, medical and protective services, as well as the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population. The socioeconomic analysis also includes consideration of Environmental Justice, a determination of whether any project impacts fall disproportionately on a low-income or minority population. This analysis discusses the potential direct and cumulative impacts of the proposed Russell City Energy Center (RCEC) and Advanced Water treatment (AWT) plant 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 federal 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.

Civil Rights Act of 1964, Public Law 88-352, 78 Stat.241 (Codified as amended in scattered sections of 42 U.S.C.) Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national programs in all programs or activities receiving federal financial assistance.

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.

Title 14, California Code of Regulations, Section 15131

- Economic or social effects of a project shall not be treated as significant effects on the environment.

- 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

City of Hayward

City of Hayward General Plan. 1998

Hayward Unified School District

School Impact Fees assessed pursuant to the California Education Code Section 17620 and Government Code Section 65995(b)(2).

SETTING

The project site is situated within the City of Hayward, in the West Industrial Planning Area of Hayward's Industrial corridor. The City of Hayward is in Alameda County.

As shown in **SOCIOECONOMICS TABLE 1**, Census 2000 data shows Alameda County's population as 1,443,741 and the City of Hayward's was 140,030. Table 1 shows the percent minority population for Alameda County, the City of Hayward, and for the project's six-mile radius. The six-mile radius is used in staff's Environmental Justice screening analysis, described in the Discussion of Impact section of this analysis. According to the 1990 Census, approximately 9.0 percent of Hayward's population was below the poverty level, compared with 7.2 percent for the six-mile radius. Data from the 2000 Census on poverty levels is not yet available.

SOCIOECONOMICS TABLE 1
Demographic Profile of Alameda County, City of Hayward and Surrounding Communities 1990 & 2000

	1990			2000		
Race/ethnicity	Alameda County	City of Hayward	6-Mile Radius	Alameda County	City of Hayward	6-Mile Radius
Total population	1,304,347	111,498	268,943	1,443,741	140,030	349,147[1]
White (excluding Hispanic)	48.8%	61.8%	64.4%	40.9%	29.2%	34.84%
Minority	51.2%	38.2%	35.6%	59.1%	70.8%	65.16%
% Poverty status persons	10.6%	9.0%	7.2%	Not Available	Not Available	Not Available

Sources: Dept. of Finance Demographic Unit; 1990 & 2000 Census
1. Census 2000 block level data.

EMPLOYMENT AND ECONOMY

In 2000, the California Employment Development Department (EDD) estimated the City of Hayward's labor force at 64,790 with an unemployment rate of 3.0 percent. By comparison, Alameda County's labor force was estimated at 740,000 and California's at 16,703,100 with unemployment rates of 3.0 percent and 5.4 percent, respectively.

Construction and operation of this project is expected to draw on the existing labor pool of seven Bay Area counties. As shown in **SOCIOECONOMICS TABLE 2,** potential construction labor force in the required occupations from which to draw is estimated at over 211,000. Plant operations labor pool is estimated at almost 69,000.

Because of the nature of the construction industry in the region, the labor force in the San Francisco Bay Area is accustomed to commuting to construction sites.

HOUSING

The 2000 Census reports that there are 540,183 housing units in Alameda County, of which 45,992 are in Hayward, 18,877 are in Union City and 31,334 are in San Leandro. In early 2000, vacancy rates in Hayward were as low as 4.97 percent, which was slightly less than the 5.01 percent for the County and 5.22 percent for the Bay Area region.

There are over 1,800 hotel/motel rooms in Hayward and the surrounding communities of San Leandro, Union City and Castro Valley, and over 12,000 in Alameda County. The average year 2000 occupancy rate for the Oakland Metropolitan Statistical Area (MSA) which covers Alameda and Contra Costa counties was 71 percent.

There are approximately 1,800 mobile home spaces in Hayward and surrounding communities and 75 recreational vehicle (RV) spaces. Mobile home parks are fully occupied year-round. They have been converted to conventional housing to accommodate the increasing County population and high cost of residential property. Very few RV spaces are available for temporary use on a reliable basis.

SOCIOECONOMICS TABLE 2
Potential Labor Force in the Principal Labor Pool Area[1]

Occupational Title	Annual Averages[2] 1999	2002	Percentage Change
Construction:			
Boilermakers	120	100	-16.7
Bricklayers/Cement Mason	3,640	4,340	19.2
Carpenters	13,360	15,260	14.2
Electricians	9,020	10,440	15.7
Insulators	830	1,120	34.9
Ironworkers (structural metal workers	310	350	12.9
Laborers	102,240	123,490	20.8
Millwrights	480	130	-10.4
Operating Engineers	2,600	3,130	20.4
Painters	5,920	7,080	19.6
Pipefitters/Sprinklerfitters	5,680	6,850	20.6
Sheetmetal Workers	3,590	3,870	7.8
Supervisors (construction)	5,690	6,650	16.9
Surveyors (including technicians)	1,610	1,590	-1.2
Truck Drivers	20,310	21,840	7.5
Welders	4,330	4,990	15.2
Total Construction:	**179,730**	**211,530**	**17.7**
Operations:			
Mechanical Engineers (including technicians)	7,240	9,190	26.9
Electrical Engineers (including technicians)	41,200	53,720	30.4
Plant and System Operators	5,600	5,710	2
Total Operations:	**54,040**	**68,620**	**27**

Source: California Employment Development Department, 1999
[1]The labor pool area here includes the counties of Alameda, Santa Clara, Contra Costa, San Mateo, San Francisco, Santa Cruz and San Joaquin.
[2]Figures represent aggregated county-wide from 1999

UTILITIES, EMERGENCY, AND OTHER PUBLIC SERVICES

Natural Gas

Natural gas is provided to Hayward and the project site by PG&E. Natural gas is supplied to the project site via Line 153, which runs through the Hayward Industrial Corridor along the Union Pacific Railroad right-of-way, less than a mile east of the project site.

Electricity

Electricity is delivered to the project site via the 115kV corridor that runs between PG&E's Eastshore and Grant substations.

Sewer

Services are provided by the City of Hayward and the East Bay Municipal Utility District (EBMUD) (EBMUD 2000). Hayward wastewater is processed at the City's Water Pollution Control Facility (WPCF), located at 3700 Enterprise Avenue directly across the street from the project site. The plant is rated at 16.5 million gallons per day (mgd).

Water

Services are provided by the City of Hayward and EBMUD. Primary domestic and firefighting water needs within the City limits are provided by the City, which gets its potable water from the Hetch Hetchy reservoir. The City's water system capacity is 32 mgd, while current water consumption averages 19 mgd. The Alameda County Water District (ACWD) supplies 45 mgd of water to Union City, Fremont and Newark. EBMUD supplies water to some of the unincorporated communities and the City of San Leandro. It currently supplies 304 mgd to its customers, or approximately 60% of its capacity.

The City of Hayward will supply water needs during both construction and plant operation. The RCEC industrial process water will come from the AWT which, once constructed, will be owned and operated by the City. The RCEC will require 3.33 mgd under normal operating conditions, and 5.27 mgd under peak water supply demand conditions. Process and cooling water supply will be tertiary treated.

Police Protection

Police services at the project site are provided by the City of Hayward Police Department. The Department is located 2.4 miles from the project site and employs 268 full-time officers in patrol, investigation and administration.

The Alameda County Sheriff's Office is the law enforcement agency for the unincorporated areas of the County. It also supplements the City Police by providing such services as Coroner and Director of Emergency Services.

Emergency and Medical Services

Closest to the project site are the Kaiser Foundation Hospital and St. Rose Hospital, located 2 and 2-1/4 miles away, respectively. Both hospitals provide emergency health services. Their combined capacity is 399 beds. Emergency paramedic services are provided by the City Fire Department.

Schools

The project area is served primarily by the Hayward Unified School District (HUSD), which operates 33 schools, including 24 elementary, 5 middle and 4 high schools. Student enrollment reached 23,773 in the 1999-2000 school year, an increase of 9.6% from 1996. Enrollment is expected to increase with population growth.

The school nearest to the project site is Anthony Ochoa Middle School, located 1½-miles away. Other schools within 2-miles of the project site are Eden gardens Elementary School, located 1¾ miles away and Central Kitchen and Darwin Center for Special Education.

Fiscal and Public Finance

Property taxes are levied and collected annually by Alameda County at a rate of 1.1572 percent of the property value. RCEC's total value for property tax purposes has not been established. As stated in the Application for Certification (AFC), the project's estimated value is between $300 to $400 million. Based on this estimation, total property tax would range from $3.47 million to $4.63 million annually. The County would return a portion of this amount to the City of Hayward. Under current State Law, the City should net between $496,916 and $662,555 in property tax revenue annually from the project.

In Fiscal Year 2000, the City's sales tax revenue was $29,484,000, or 53.9 percent of total tax revenue. Projected sales tax revenue for FY 2001 is $32,900,000, or 54.8 percent of total tax revenue (City of Hayward Finance Department).

SOCIOECONOMIC TABLE 3 provides a summary of the City's recent and projected tax revenue under current law. However, there are two pending actions at the State level that could alter the method by which power plants are assessed and the way the property tax revenue they generate is allocated.

SOCIOECONOMIC TABLE 3
City of Hayward Tax Revenue Summary under Current Law

Revenue Source	1999-2000 Actual Revenue ($1,000)	2000-2001 Projected Revenue ($1,000)
Property Taxes	14,739	15,630
Sales Tax	29,484	32,900
Business Tax	1,812	1,800
Real Property Tax	3,815	4,900
Transient Occupancy Tax	1,367	1,400
Supplemental Improvement	1,798	1,700
Emergency Facilities Tax	1,727	1,700
Total:	**54,742**	**60,030**

Source: City of Hayward Finance Department

IMPACTS

The following table presents the Environmental Checklist of the CEQA Guidelines and a discussion of potential impacts consistent with the Environmental Checklist.

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOCIOECONOMICS: POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
d) Have a significant minority or low-income population within a six-mile radius that may be subject to disproportionate adverse effects of the project?			X	
Public Services – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for the following:				
e) police protection?				X
f) schools?				X
g) other public services?				X

DISCUSSION OF IMPACTS

A. Induced Population Growth

Construction of the RCEC and AWT is expected to span 18-21 months during a two-year period starting in the summer of 2002. Construction workforce will vary in size, averaging 277 and peaking at approximately 485 during month 15. Total construction workforce will be approximately 6,396 person-months. Most of the construction workforce is expected to be drawn from Alameda and surrounding counties (Contra Costa, San Francisco, San Joaquin, San Mateo, Santa Clara and Santa Cruz Counties). A listing of the monthly distribution of construction workforce by trade is presented in **SOCIOECONOMICS TABLE 4.** The average number of project construction workers represents 0.13% of the projected 2002 labor pool of 211, 530 **(SOCIOECONOMIC TABLE 2)**.

Once in operation, the RCEC plant will have 25 full-time employees. The AWT will be staffed by 6 full-time employees. These employees are expected to be recruited from Bay Area counties. **SOCIOECONOMIC TABLE 5** presents a breakdown of the plant operations personnel.

SOCIOECONOMIC TABLE 5
PLANT OPERATION PERSONNEL

Department	Personnel	Shift	Word Days
Operations, Plans	10 Operating Technicians		7 days a week
Maintenance Plans	5 Maintenance Technicians (2 mechanical, 1 electrical, and 2 instrumental)	Standard 8-hour days	5 days a week (Maintenance Technicians will also work unscheduled days and hours as required)
Administration Plans	5 Administrators (1 Operations Supervisor, 1 Maintenance Supervisor, 1 Plant Manager, 1 Plant Administrator and 1 Plant Engineer)	Standard 8-hour days	5 days a week with additional coverage as required
AWT	6 Operating Technicians	Rotating 12-hour shift, 2 operators, per shift, plus 2 relief operators	7 days a week

SOCIOECONOMIC TABLE 4
Month Distribution of Construction Workforce by Trade
(Months After Notice to Proceed)

Craft Mix	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Boilermaker	-	-	-	8	16	24	36	45	48	48	48	48	48	48	45	40	30	16	8	4	2	-	-	-	**562**
Carpenter	2	12	24	40	40	40	40	33	22	22	22	22	22	22	22	22	22	22	18	9	3	-	-	-	**481**
Cement Mason	-	1	4	5	5	7	7	9	9	6	5	5	4	4	-	-	-	-	-	-	-	-	-	-	**71**
Electricians	1	4	8	11	11	12	22	33	49	66	83	88	88	88	88	82	66	55	44	33	11	-	-	-	**943**
Iron Worker	-	4	16	33	33	33	39	44	49	50	40	33	26	18	14	9	9	9	9	5	-	-	-	-	**473**
Labor	5	10	18	27	30	30	30	30	24	24	24	23	23	22	22	22	22	18	13	9	9	-	-	-	**435**
Millwright	-	-	-	-	-	3	13	26	33	33	33	27	26	26	22	18	13	9	7	4	4	-	-	-	**297**
Operator	3	5	9	11	14	16	16	16	16	16	14	14	14	14	14	11	11	9	7	4	2	-	-	-	**236**
Pipe Fitter	2	12	18	18	16	20	24	33	49	77	112	121	121	121	121	121	110	88	66	33	13	-	-	-	**1296**
Teamster	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	-	-	-	**35**
Insulation Worker	-	-	-	-	-	-	-	-	-	-	-	7	13	27	33	39	39	39	39	26	13	-	-	-	**275**
Painter	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	6	6	6	6	5	5	-	-	-	**38**
Sheet Metal	-	-	-	-	-	-	-	-	-	-	-	5	13	27	39	39	39	39	37	37	25	-	-	-	**300**
Total Craft Manpower	15	50	99	155	167	187	229	271	301	344	383	396	401	420	422	410	368	311	255	170	88	0	0	0	**5442**
Field start-up staff	-	-	-	-	-	-	-	-	1	1	2	7	11	14	14	15	15	16	15	14	14	12	6	4	**161**
Field non-manual staff	7	14	20	27	33	40	43	46	49	50	50	50	50	50	49	49	46	40	33	22	13	6	4	2	**793**
On-site total	22	64	119	182	200	227	272	317	351	395	435	453	462	484	485	474	429	367	303	206	115	18	10	6	**6396**

Little or no permanent relocation of construction workers is expected to result from this project. Most workers are expected to commute to the project site. Some may stay at local hotels and motels during the week for limited periods of time. There are approximately 1,800 hotel/motel rooms in Hayward, San Leandro, Union City, San Lorenzo, and Castro Valley. Given the countywide average occupancy rate of approximately 70 percent in 2000 and the Hayward area rate of 72 percent, it is expected that ample rooms should be available to project workers as temporary housing during construction. Because of the use of mobile home spaces as conventional housing and the very limited and unreliable low supply of RV spaces, construction workers may not rely on these forms of accommodations.

Few of the RCEC and AWT operators are expected to relocate because of their positions at these plants. Even if some did relocate to Hayward or a neighboring community, their impact on housing resources will not be significant because of their small number relative to the area's housing supply. Therefore, staff concludes that project construction and operation will neither directly or indirectly induce substantial population growth nor impact the demand for housing in Hayward and surrounding communities.

B Displacement of Housing

The RCEC and AWT are located in Hayward's West Industrial Planning Area of Hayward's Industrial Corridor. No residences are located on the proposed project site. No nearby residences will have to be relocated because of significant environmental impacts resulting from this project. No replacement housing will have to be constructed as a result of the project. Staff concludes that the proposed project will not result in displacement or replacement housing impacts.

C .Displacement of People

As described in Section b above, no housing will be displaced by the project. Similarly, no people will be displaced by the proposed project, resulting in no project impacts.

D. Disproportionate Significant Adverse Impact on Minority and Low-Income Populations (Environmental Justice Screening Analysis)

The purpose of the screening analysis is to determine whether there exists a minority and/or low-income population within the potential affected area of the proposed project.

Minority and/or low-income populations, as defined by the U.S. Environmental Protection Agency's April 1998 Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses, are identified where either:

- The minority population of the affected area is greater than fifty percent of the affected area's general population; or

- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Energy Commission staff has determined the potential affected area is a six-mile radius of the proposed RCEC site. The six-mile radius is consistent with the radius used for staff's cumulative air quality analysis. When a minority and/or low-income population is identified per the above, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics and transmission line safety and nuisance consider possible impacts on the minority/low-income population as part of their analysis. This "environmental justice" (EJ) analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified.

Staff's environmental justice approach includes providing notice (in appropriate languages) of the proposed project and opportunities for participation in public workshops to minority and/or low-income communities, and providing information on staff's EJ approach to minority and/or low-income persons who attend staff's public workshops.

SOCIOECONOMICS FIGURE I shows the minority populations based on 2000 census block data within a six-mile radius of the proposed RCEC site. According to the 2000 census block data, the minority population in the affected area comprises 64.7 percent of the total population. This is significantly higher than the 29.2 percent minority population in the City of Hayward, and slightly higher than 59.1 percent and 53.3 percent minority populations for Alameda County and the State of California, respectively. The closest minority residential area to the RCEC site is located less than two miles to the east, in the same census tract (4371) in which the project is located.

According to the 1990 Census, 7.2 percent of the population was below the poverty level. Under the 2000 Census figures expected to be available later this year, this percentage is not expected to exceed 50 percent. In 1990, 15 of the 73 census tracts within the affected area had below-poverty-level population greater than 10 percent, and 2 tracts above 20 percent. Tract 4377, located approximately three miles east of the RCEC site had 28.6 percent, or the highest percentage of below-poverty-level population.

Although the minority population within the six-mile radius represents 64.7 percent of the total population, staff has determined that the project will not result in significant adverse socioeconomic impacts. Because there are no significant adverse socioeconomic impacts, staff concludes that there are no environmental justice issues in the area of Socioeconomic Resources. For a summary of conclusions for the other technical areas listed above, please refer to the **Executive Summary**.

E. Police Protection

Law enforcement services will be provided by the Hayward Police Department. Calpine/Bechtel will provide security services during plant construction and operation. Existing law enforcement personnel patrol the City's industrial area regularly and are capable of providing adequate routine police service to the proposed project. Calpine will erect and maintain a security fence around the construction site and other construction equipment, and hire security guards to patrol it around the clock. The

SOCIOECONOMICS FIGURE 1

G. Other Public Services

Project construction will require minimal consumption of utilities and public services support. This includes water, sewer, gas, and health services. The applicant has prepared and will ensure worker compliance with its standard worker health and safety program designed to minimize the occurrence of construction-related accidents. However, in the event that health services are required, adequate facilities are available within a reasonable distance of the project site. Emergency paramedic services will be provided by the City of Hayward Fire Department.

Pacific Gas and Electric will provide electricity and natural gas to the proposed project once completed. Natural gas will be supplied via a new 16-inch pipeline connecting the project to PG&E's 30-inch Line 153. Therefore, the proposed project will not adversely affect the supply of natural gas to the surrounding communities.

Cooling water for the RCEC will be supplied by the new AWT facility to be constructed as part of this project and by the City of Hayward. It will treat municipal effluent to potable water quality required by the RCEC. Therefore, the project will not result in adverse operational environmental effects on the water supply for the City's general population or other industrial uses. In addition, current facilities are capable of handling all effluent discharges from the RCEC, including sanitary water and plant drainage.

FISCAL AND PUBLIC FINANCE

Total construction cost of the proposed project is estimated at $300-400 million, of which $58.2 million are labor costs. Based on the State of California's income multiplier of 1.59, project construction could inject over $92 million into the local economy. In addition, Calpine has committed to reimburse the City for all incremental public services costs it will incur during construction.

Calpine has estimated that sales tax revenue to the City and County would range from $62,500 - $125,000, based on $5-10 million of products purchased locally during construction. Once the plant becomes operational, its payroll will be an annual $1.3 million. In addition, Calpine is in discussions with the City of Hayward to provide funding for a number of projects to benefit the community in the areas of educational services, library facilities, parks and recreation, extension of the Bay Trail, and water treatment.

However, as noted in the Setting discussion above, there are two pending actions at the State level that could alter the method by which power plants are assessed and the way the property tax revenue they generate is allocated.

First is AB 81 (Migden), which was approved by the Senate and is pending Assembly concurrence. This bill would change the method by which the RCEC property and other large power plant properties are taxed. It would shift the responsibility for property tax assessment of large power plants from the County Assessor to the State Board of Equalization (BOE) by making it a "state assessed property." It would also require

annual reassessment at fair market value, and provide that the property taxes collected be distributed exclusively to the taxing jurisdictions within the Tax Rate Area in which the facility is located. (A "Tax Rate Area" is a grouping of properties within a county wherein each parcel is subject to the taxing powers of the same combination of taxing agencies). While AB 81 could substantially increase total property tax revenue from the RCEC over its lifetime, local governments, schools and other special districts in the RCEC Tax Rate Area would receive the same percentage of the total that they currently receive from property that is assessed by the County Assessor.

Second is the BOE's November 28, 2001 action to amend Rule 905 (Assessment of Electric Generation Facilities) to provide that electric generation facilities, over 50 megawatts, that are owned or used by an electrical corporation, as defined in the Public Utilities Code, will be assessed by the State. Certain small qualifying facilities and qualifying cogeneration facilities would be excluded. This Rule change was approved by the Office of Administrative Law (OAL) and will take effect on January 1, 2003.

Once it takes effect, the BOE action would return the power plant assessment methodology to that which existed prior to California's deregulation of public utilities in 1996, consistent with the assessment jurisdiction provisions in AB 81. However, Rule 905 does not address revenue allocation. For State assessed property, the property tax collected is distributed to all the taxing jurisdictions in the county according to a statutory formula. For locally assessed property, only those taxing jurisdictions in the Tax Rate Area where the property is located receive the property tax collected. The allocation of the revenue derived is solely within the purview of the Legislature and the Governor. Now that the BOE's Rule change has become final, the Legislature is expected to approve AB 81 in the current session and send it to the Governor for his signature with a formula that is equitable to all of the affected parties. As a backup to AB 81, Assemblymember Joe Canciamilla, Contra Costa County, introduced AB 2073 which would retain the assessment responsibility with the BOE and revenue allocation formula as that of the County Assessor.

CUMULATIVE IMPACTS

Since the proposed project would not result in any significant adverse socioeconomic impacts on population, housing and public services, it is not expected to contribute to cumulative socioeconomic impacts in the South Bay or San Francisco Bay Area.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

EBRPD (8-8) –7. The August 8, 2001 letter from the East Bay Regional Park District (EBRPD) states that that it is concerned with potential significant impacts on parklands from the proposed project, including but not limited to socioeconomic impacts to parkland visitors. In discussing this comment with EBRPD's attorney at the Preliminary Staff Assessment Workshop in Hayward on November 28, 2001, he explained that this comment was intended to address the access of all socioeconomic groups to the Bay Trail and to the quality of their recreational experience next to the RCEC. The Trail will be open to any and all persons wishing to use it. The EBRPD is responsible for publicizing the location accessibility of the Trail.

CONCLUSIONS AND RECOMMENDATIONS

The proposed project would not induce significant population growth in the affected area, cause the displacement of housing or people, or have a significant adverse socioeconomic effect on minority and/or below-poverty-level population. The project would not adversely impact public agencies to maintain acceptable service ratios, response times and fire protection, police protection, schools and other public services.

Staff concludes that the proposed project will not result in significant adverse socioeconomic effects on population, housing and public services.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within Alameda County unless:

- To do so will violate federal and/or state statutes;
- The materials and/or supplies are not available;
- Qualified employees for specific jobs or positions are not available; or
- There is a reasonable basis to hire someone for a specific position from outside the local area.

Verification: At least 60 days prior to the start of demolition, the project owner shall submit to the 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 City of Hayward Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

REFERENCES

Advanced Life Support First Responder Services Agreement between the County of Alameda and the City of Hayward. March 14, 2000.

Ameri, Alex, 2001. Telephone communication between Alex Ameri, Deputy Director of Public Works for Utilities, City of Hayward and Dan Gorfain, Aspen Environmental Group, July 20, 2001.

Ameri, Alex, 2001. Telephone communication between Alex Ameri, Deputy Director of Public Works for Utilities, City of Hayward and Dan Gorfain, Aspen Environmental Group, August 15, 2001.

California Energy Commission (CEC). CEC 2001a, pages 26 to 28. Data Requests. Date July 25, 2001.

Calpine/Bechtel Joint Development. Calpine 2001, AFC Section 8.10. Application for Certification, Russell City Energy Center (01-AFC-07) filed May 22, 2001.

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TRAFFIC & TRANSPORTATION

Testimony of Fred Choa, P.E.

INTRODUCTION

The traffic and transportation section of the final staff assessment (FSA) provides an independent analysis of the Russell City Energy Center (RCEC) project proposed by Calpine / Bechtel joint Development. Potential impacts related to traffic operations and safety hazards resulting from the construction and operation of the project are discussed.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Federal, state, and local regulations that are applicable to the proposed project are listed below. Included are regulations related to the transportation of hazardous materials, which are designed to control and mitigate for potential impacts. The Applicant has indicated its intent to comply with all federal, state, and local regulations related to the transport of hazardous materials.

FEDERAL

- Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, 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

- Section 353 defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of substances presenting inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11 regulate the safe operation of vehicles, including those that are used for the transportation of hazardous materials.
- Sections 25160 et seq. addresses the safe transport of hazardous materials.

- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, the possession of certificates permitting the operation of vehicles transporting hazardous materials is required.
- 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 Street 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.

All construction within the public right-of-way will need to comply with the "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans, 1996).

LOCAL

The Transportation Element in the 1998 Hayward General Plan sets forth goals, policies, and implementation programs related to traffic issues in the city. These goals include minimum level of service (LOS) standards for local intersections. The City requires all new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase. The City of Hayward has defined the desirable level of service to be D during peak commute times except when a LOS E may be acceptable due to costs of mitigation or when there would be other unacceptable impacts.

SETTING

The primary transportation corridors in the City of Hayward are Interstate 880 (known as the Nimitz Freeway) and State Route 92 (San Mateo Bridge). I-880 runs from north to south and provides a connection between Oakland and San Jose. This facility is under the jurisdiction of the California Department of Transportation (Caltrans), serving approximately 221,000 vehicles on a daily basis. According to the Hayward General Plan, this freeway is designed with limited access to serve regional through traffic. In the vicinity of the proposed Russell City Energy Center, I-880 is an 8-lane freeway, with three (3) mixed flow lanes and one (1) High Occupancy Vehicle (HOV) lane in each direction. Access to the project site from I-880 is provided via the Winton Avenue interchange.

State Route 92 (San Mateo Bridge) runs from east to west across the San Francisco Bay and is one of three bridges connecting the East Bay with the San Francisco Peninsula. In the vicinity of the project, SR 92 provides two (2) lanes in each direction and is also under the jurisdiction of Caltrans. Currently, the freeway is being widened to provide one (1) HOV lane in each direction between I-880 and the San Mateo Bridge toll plaza. The HOV lane project will be completed by summer of 2002 and before the construction phase of the Russell City Energy Center. Approximately 95,000 vehicles

travel on this facility on a daily basis with the peak directions of travel being westbound during the a.m. peak period and eastbound in the p.m. peak period. I-880 and SR 92 intersect in Hayward approximately 2 miles east of the proposed Russell City Energy Center. Access to the project site from SR 92 is provided via the Clawiter Road interchange.

The project site is located on Enterprise Avenue (directly north of SR 92) in the City of Hayward and County of Alameda. The most direct travel route to and from the project site is from SR 92 and north from the Clawiter Road interchange. Approximately 0.4 miles north of SR 92, a left turn onto Enterprise Avenue will lead to the project site located directly west of Whitesell Street. In the vicinity of the project site, Enterprise Avenue is constructed with a minimum 24-foot cross-section with no lane striping. This facility is classified as a cul-de-sac with an approximate roadway capacity of 1,000 vehicles per day.

This project will also include the construction of various linear facilities. A natural gas pipeline is proposed to be installed along Enterprise Ave. It will begin at the site and extend east to Clawiter Rd. The pipeline will then turn south along Clawiter Rd. and immediately turn east off of the roadway.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
TRANSPORTATION/TRAFFIC -- Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?		X		
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			X	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
e) Result in inadequate emergency access?			X	
f) Result in inadequate parking capacity?		X		
g) Create a significant hazard to the public or the environment through the routine transportation of hazardous material?			X	

DISCUSSION OF IMPACTS

A. Substantial Increase in Traffic

The project is expected to generate 574 daily trips (287 round trips) during the average construction period and 1020 daily trips (510 round trips) during the peak construction period. Construction of the proposed facility will occur between the summer of 2002 and the spring of 2004 (18 to 21 months). Full-time staff at the

facility will consist of 277 employees on average and approximately 485 employees during peak construction months (months 11-16).
In order to assess the potential of project-related traffic significantly impacting City of Hayward intersections and/or Caltrans facilities, the following four scenarios were analyzed: existing traffic, existing plus peak construction traffic, existing plus operation traffic, and cumulative conditions. The level of service methodology was based on the "Critical Movement Analysis Planning Method" described in Transportation Research Circular No. 212 (TRB, 1980). The Planning Method calculates a "sum of critical volumes" for the critical traffic control phases of an intersection (phases for which there might be significant delay or obstruction), and a corresponding Level of Service (LOS).

According to the City of Hayward General Plan, the minimum desirable level of service is D during peak commute times except when a LOS E may be acceptable due to costs of mitigation or when there would be other unacceptable impacts. With the exception of the intersection at SR 92 and Clawiter Road, the local intersections operate above the minimum established LOS thresholds. Furthermore, no decrease in LOS is evident between existing and existing plus construction/operation traffic conditions.

The unsignalized intersection of westbound SR 92 and Clawiter Road currently operates at unacceptable LOS F conditions. The City of Hayward has plans to improve this intersection by constructing a traffic signal and making other minor improvements. These improvements should be completed before the Russell City Energy Center construction phase begins in summer 2002. Even though the addition of construction/operation traffic to this intersection only represents a minor percentage of traffic and does not significantly reduce the LOS, it would cause a short-term increase in the congestion that already exists. Therefore, a construction traffic control plan and implementation program that limits construction-period truck and project-related commute traffic to off-peak periods in coordination with the City of Hayward and Caltrans should be developed to offset this project impact. The Applicant has indicated their intent to provide such a plan (see **Condition of EXEMPTION TRANS-1**).

In addition, construction of linear facilities (i.e., gas/water pipelines, transmission lines) will include temporary traffic lane closures, thereby affecting the capacity of the following roadways:

Enterprise Avenue (between project site and Clawiter Road)
Clawiter Road (between Enterprise Avenue and Berkeley Farms site)

The applicant has indicated their intent to prepare a traffic control plan related to the construction of linear facilities, which will include a discussion on the use of flagmen, advanced warning flashers, and signage for temporary lane closures. In addition, this traffic control plan should include timing of linear facilities construction to take place outside peak traffic periods to avoid traffic flow disruptions.

B. Exceedance of Established Level of Service Standards

According to the City of Hayward's General Plan, the minimum acceptable level of service is defined as D during the peak commute times except when a LOS E may be acceptable due to costs of mitigation or when there would be other unacceptable impacts. The City requires all new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase.

The addition of the RCEC project traffic will have little effect on the existing levels of service (LOS) at local intersections in the project vicinity. Each of these intersections, with the exception of SR 92 at Clawiter Road, is expected to operate at an acceptable level of service with the addition of project construction/operation traffic (i.e., LOS D or better according to the City of Hayward's General Plan). These local intersections will experience no significant and/or adverse impacts from this project as they have sufficient capacity to absorb all project-generated traffic.

The westbound SR 92 at Clawiter Road intersection currently operates at LOS F. The City of Hayward will be constructing intersection improvements this year at this location. The addition of a traffic signal and minor improvements is expected to be in place prior to the beginning of the Russell City Energy Center construction phase. Although the addition of construction/operation traffic at this intersection would not significantly reduce the LOS and even though impacts would only occur on a temporary basis (i.e., during the 18-21 month construction phase of the project), it would cause a short-term increase in the congestion that already exists. Therefore, development and implementation of a construction traffic control plan should be required to offset these impacts (see **Condition of Exemption TRANS-1**).

Decrease in service levels resulting from temporary lane closures related to construction of linear facilities would also require the development and implementation of a construction traffic control plan to offsets these traffic impacts.

C. Change in Air Traffic Patterns: No Impact

The Russell City Energy Center has no major commercial aviation center in the area, with the Oakland International Airport located approximately seven miles to the northeast. The closest local airport is the Hayward Municipal Airport that is approximately one and a half miles to the northeast of the proposed project site. The runway is aligned with a northwest to southeast bearing. Aircraft will be expected to approach from those two directions and will not conflict with the proposed Russell City Energy Center facility.

D .Substantial Increase in Traffic Hazards: Less than Significant Impacts

Staff observations of the project area indicate that a potential traffic operation problem or hazard could occur near the jobsite. Truck deliveries that occur during the construction and operation phase of the project may have a problem turning around after delivery. Since the proposed jobsite sits at the end of Enterprise Avenue, and because Enterprise Avenue is a cul-de-sac roadway, trucks cannot simply drive around the block to head back out towards Clawiter Road. The proposed site must

take into consideration the fact that delivery trucks will possibly need to turn around within the Russell City Energy Center site. Therefore, access and egress should be designed accordingly.

Immediate access to the Russell City Energy Center site would be provided directly from Enterprise Avenue. Although left-turn lanes are not provided for vehicles turning left into the site, excessive delays are not expected from this movement due to the relatively low level of existing traffic on Enterprise Avenue and the fact that the facility is at the end of a cul-de-sac.

The Applicant has indicated its intent to comply with all weight and load limitations on state and local roadways.

E. Inadequate Emergency Access

The project will not lead to inadequate emergency access (EVA) because intersections impacted by construction will be maintained at an acceptable service level to the City of Hayward with the implementation of a construction traffic control plan. Therefore, no traffic congestion affecting emergency access is expected on Enterprise Avenue or Clawiter Road near the project site.

The main EVA to the site is along Enterprise Avenue. A secondary EVA is provided from Whitesell Street. An additional future improvement will connect Whitesell Street to Depot Road and over SR 92. These improvements will improve the secondary EVA.

The Applicant has also indicated their intent to maintain emergency access on applicable roadways during construction of linear facilities.

F .Inadequate Parking Capacity

The applicant has acknowledged the fact that onsite parking may be inadequate during the peak construction phase of the proposed project. Therefore, development and implementation of an off-site construction employee-parking plan should be required to offset these impacts (see **Condition of Exemption TRANS-2**).

Two feasible sites that have been identified for possible off-site parking are the PG&E East Shore Substation and the Hayward Municipal Airport. The airport sits about 1-1/2 miles to the northeast and the PG&E facility is approximately ¾ mile to the southeast. The applicant has committed to charter full-size AC Transit busses to shuttle employees between the jobsite and offsite parking. Construction employees would park at the designated facility and take a 100 passenger shuttle bus to the project site. Busses will run every 5 minutes prior to 7:00 am and at 3:30 pm with one bus scheduled after 7:00 am and after 3:30 pm. Since the Application for Certification (AFC) analyzed potential impacts by assuming project generated would drive to and from the project site, off-site parking would reduce potential impacts at the Clawiter Road / Enterprise Avenue intersection.

G. Transportation of Hazardous Material

The construction and operation of the plant will require the transportation of various hazardous materials, including: aqueous ammonia, solvents, lube oils, paint, paint

thinners, adhesives, batteries, construction gases, etc. The transport of hazardous materials over city streets has the potential to result in an increase in traffic hazards. The Russell City Energy Center AFC has indicated that the transportation of hazardous materials to and from the site will be conducted in accordance with all applicable LORS for the handling and transportation of hazardous materials. All hazardous material deliveries should be routed as follows: from SR 92 exit northbound at Clawiter Road, turn left at Enterprise Avenue, and enter the RCEC shortly after passing Whitesell Street (see **Condition of Exemption TRANS-3**).

CUMULATIVE IMPACTS

Although one other proposed project has been identified to occur within 2 miles of the proposed Russell City Energy Center project (i.e., Duc Development Corporation's planned housing and industrial development), its construction schedule has not yet been determined. If both projects were constructed at the same time, there would most likely be less than significant impacts since the RCEC generated trips would access SR 92 at Clawiter Road while the Duc Development trips would access I-880 and SR 92 via Industrial Boulevard. Therefore, staff concludes that there will be no significant cumulative impacts.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

City of Hayward

City(7-27)-6 – *The City is concerned with the proposed project interfering with Caltrans widening work on State Route 92.*

The proposed conditions of exemption require that most of the construction workers will be arriving at designated off-site parking facilities and taking a chartered shuttle bus to the jobsite. The typical construction work-day begins at 7:00 a.m. and ends at 3:30 p.m., therefore, both employee traffic and shuttle busses will primarily operate outside of the adjacent roadway peak hours. This traffic is not expected to interfere with Caltrans widening work.

Public Comment

AL-1 – *A member of the public has expressed their concern over how the applicant will mitigate travel impacts caused by the proposed project.*

The *Discussion* and *Proposed Conditions of Exemption* sections of this report summarize the anticipated traffic impacts and applicant requirements for mitigation. According to the City of Hayward General Plan, the minimum desirable level of service is D during peak commute times except when a LOS E may be acceptable due to costs of mitigation or when there would be other unacceptable impacts. The analysis shows that the local intersections that were studied operate above the minimum established LOS thresholds. Furthermore, no decrease in LOS is evident between existing and existing plus construction/operation traffic conditions. Although LOS impacts are negligible, the applicant will be required to mitigate as follows:

- The project owner shall develop a construction traffic control and transportation demand implementation program that limits construction-period truck and commute traffic to off-peak periods in coordination with the City of Hayward and Caltrans.
- The project owner shall develop an off-site construction employee-parking program that is designed to reduce the number of trips in the project vicinity.
- The project owner shall ensure that all federal, state, and local regulations for the transportation of hazardous materials are observed.

CC-1 – *A member of the public has expressed their concern over construction employee parking and transportation.*

As a condition of **TRANS**-1, the project applicant will be required to develop an off-site construction employee transportation and parking program that is designed to reduce the number of trips in the project vicinity. The applicant will be required to show that the location and number of parking spaces available off-site is adequate for peak construction employees, that the number of busses and bus capacity will be adequate to shuttle peak construction employees to and from the project site, that the hours of operation for the shuttle bus pickup and drop off times are generally outside the adjacent street peak hours, etc.

CONCLUSIONS

Provided that the Applicant develops a construction traffic control and implementation program, an off-site construction employee-parking program, and follows all LORS acceptable to the City of Hayward and Caltrans for the handling of hazardous materials, the project will result in less than significant impacts.

PROPOSED CONDITIONS OF EXEMPTION

TRANS-1 The project owner shall develop a construction traffic control and transportation demand implementation program that limits construction-period truck and commute traffic to off-peak periods in coordination with the City of Hayward and Caltrans. Traffic associated with construction of the RCEC shall be mitigated by avoiding peak transportation hours associates with the area, including Gillig Corporation, Berkeley Farms Incorporated, and other major employers in the area. In addition, the use of the railroad spur shall not block traffic during a.m. or p.m. peak hours. Specifically, this plan shall include the following restrictions on construction traffic:

- establish construction work hours outside of the peak traffic periods to ensure that construction workforce traffic occurs during off-peak hours, except in situations where schedule or construction activities require travel during peak hours, in which case workers will be directed to routes that will not deteriorate the peak hour level of service below the City of Hayward's LOS D standard;
- schedule heavy vehicle equipment and building material deliveries as well as the movement of materials and equipment from laydown areas to occur during off-peak hours;

- route all heavy vehicles and vehicles transporting hazardous materials as follows: from SR 92 exit northbound at Clawiter Road, turn left at Enterprise Avenue, and enter the Russell City Energy Center shortly after passing Whitesell Street; and
- during the construction phase (every 4 months), monitor and report the turning movements for the intersection at Enterprise Avenue and Clawiter Road during the A.M. (7:30 to 8:30 a.m.) and P.M. (4:30 to 5:30 p.m.) peak hours to confirm construction trip generation rates.

The construction traffic control and transportation demand implementation program shall also include the following restrictions on construction traffic addressing the following issues for linear facilities:

- timing of pipeline construction (all pipeline construction affecting local roads shall take place outside the peak traffic periods 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.

Verification: At least 30 days prior to start of site preparation or earth moving activities, the project owner shall provide to the City of Hayward and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and transportation demand implementation program. Additionally, every 4 months during construction the project owner shall submit turning movement studies for the intersection at Enterprise Avenue and Clawiter Road during the A.M. (7:30 to 8:30 a.m.) and P.M. (4:30 to 5:30 p.m.) peak hours to confirm that construction trip generation rates identified in the AFC and used to determine less than significant impacts to City of Hayward streets and are not being exceeded.

TRANS-2 The project owner shall develop an off-site construction employee-parking program that is designed to reduce the number of trips in the project vicinity. This plan should show that the location and number of parking spaces available offsite is adequate for peak construction employees, that the number of busses and bus capacity will be adequate to shuttle peak construction employees to and from the project site, that the hours of operation for the shuttle bus pickup and drop off times are generally outside the adjacent street peak hours, etc. Since some on-site parking will be available, the parking program should assign general parking locations (on-site or off-site) to employees. Employees should not be encouraged to drive to the project site for a parking space only to realize that one isn't available.

Verification: At least 30 days prior to the start of site preparation or earth moving activities, the project owner shall provide to the City of Hayward (for determination of compliance with local LORS) and to the CPM (for approval), a copy of the parking and shuttle bus program. Additionally, he project owner shall include in its Monthly Compliance Reports information that documents the number of employees parking

offsite versus the total number of employees, the shuttle bus rider ship, and the shuttle bus hours of operation.

TRANS-3 The project owner shall ensure that all federal, state, and local regulations for the transportation of hazardous materials are observed.

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

TRANS-4 The project owner shall complete construction of Enterprise Avenue along the project frontage. Enterprise Avenue is to be constructed as a standard 60-foot industrial public street per City of Hayward Detail SD-102. This includes removal of the temporary asphalt curb, construction of approximately 21 feet of street pavement and a standard 6-foot sidewalk.

Verification: At least 30 days prior to operation of the RCEC plant, the project owner shall submit to the CPM, written verification from the City of Hayward that construction of Enterprise Avenue along the project frontage has been completed in accordance with the City of Hayward's standards.

TRANS-5 The property owner shall design and construct improvements on the portion of Whitesell Street along the project frontage. Whitesell Street shall be constructed to be 48 feet wide within a standard 60-foot right of way per City of Hayward standards.

Verification: At least 30 days prior to operation of the RCEC plant, the project owner shall submit to the CPM, written verification from the City of Hayward that improvements on Whitesell Street along the project frontage has been completed in accordance with the City of Hayward's standards.

TRANS-6 The property owner shall be required to resurface Enterprise Avenue, which had a new asphalt overlay from Clawiter Road to the project site completed in July 2001, if damage is caused by construction traffic. The degree of rehabilitation is dependent on a condition inspection by the City Engineer after completion of the RCEC project. This proposed condition is consistent with City of Hayward requirements on large development projects.

Verification: At least 30 days prior to project site mobilization, the project owner shall submit to the CPM a letter agreeing to resurface Enterprise Avenue if, in the opinion of the City of Hayward City Engineer, damage to the asphalt overlay is caused by heavy equipment used in the construction of the RCEC. If required, the project owner shall resurface Enterprise Avenue in accordance with City of Hayward's standards.

TRANS-7 The property owner shall grant to the City of Hayward a section of land of varying width up to 12 feet, totaling approximately 4,826 square feet, along the westerly side of Whitesell Street and the easterly line of Parcel 3 of Parcel Map No. 397, as shown on the 35 percent plan submittal for the realignment of Whitesell Street prepared by Bissel & Karn and submitted to the City of Hayward on January 4, 1993.

Verification: At least 60 days prior to project site mobilization, the project owner shall submit to the CPM documents verifying dedication of the defined property to the City of Hayward.

TRANS-8 The property owner shall grant to the City of Hayward a 10-foot section of land along Enterprise Avenue for street right-of-way along the northerly line of Parcel 3 of Parcel Map No. 397.

Verification: At least 60 days prior to project site mobilization, the project owner shall submit to the CPM documents verifying dedication of the defined property to the City of Hayward.

REFERENCES

City of Hayward. 1998. Hayward General Plan, circulation element (III). Hayward, CA.

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TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

The purpose of this Final staff analysis(FSA) is to assess the proposed line construction and operational plan for incorporation of the measures necessary for compliance with the noted PG&E design guidelines for transmission lines in the project area. Staff's analysis will focus on 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.

- 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)

The following federal and state laws and industry practices are intended to ensure implementation of the measures necessary to prevent occurrence of each of the impacts noted.

AVIATION SAFETY

The concern over aviation safety derives from the obstruction hazard to area aircraft from the proposed line's intrusion into the area's air space. The potential for such a hazard is addressed through the following LORS and related requirements.

- 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.

AUDIBLE NOISE AND RADIO INTERFERENCE

Radio-frequency interference and audible noise are produced from the physical interactions of the line electric fields and the air around the conductor. These impacts are produced through well understood physical mechanisms and are prevented or mitigated through compliance with the following regulations and industry practices:

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25, which prohibits operation of devices or facilities with fields capable of interference with radio-frequency communication in the fields' impact area. These regulations require all such interference to be mitigated by the operator. The potential for such interference would depend on the distance the source in question.
- General Order 52 (GO-52), California Public Utilities Commission (CPUC), which specifies the measures necessary to prevent communication interference as related to power and communication line construction, operation and maintenance.
- Regular maintenance, which eliminates the protrusions that, enhance the noise-producing impacts of electric field interactions at the conductor surface.

FIRE HAZARDS

Fire hazards from overhead transmission line operation are mostly related to sparks from conductors of overhead lines or direct contact between the line and nearby trees and other combustible objects. Such fires are prevented through compliance with the following regulations:

- General Order 95 (GO-95), CPUC, "Rules for Overhead Electric Line Construction" which 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" which specifies utility-related measures for fire prevention.

SHOCK HAZARDS

All transmission and subtransmission line operations pose a risk of hazardous or nuisance shocks to humans. These hazardous shocks are those 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. The nuisance shocks by contrast, are caused by current flow at levels generally incapable of physiological harm. They result most commonly from contact with a charged metallic object in the transmission line environment. The following regulations are intended to prevent such shocks:

- GO-95, CPUC. "Rules for Overhead Line Construction" which specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and workers working on or around the line.
- Title 8, CCR, Section 2700 et seq., "High Voltage Electric Safety Orders", which establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.
- National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines, whose provisions are intended to minimize the potential for direct or indirect contact with the energized line.
- 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), which provide for effective grounding and other safety-related practices.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

Exposure to power-frequency electric and magnetic fields is considered capable of biological impacts at levels orders of magnitude higher than encountered in the power line environment. The issue of continuing concern is the possibility of significant health impacts among humans exposed in their homes at these normally low levels related to power lines and other common sources. Although the potential for such health impacts has not been established, as noted by the applicant (Calpine/Bechtel 2001a, pages 6-24 and 6-25, and 8.9-13), the CPUC (which regulates the design and operation of high-voltage lines in the state) has established specific field-reducing designs for incorporation into the general design for new or modified lines in the state. This was CPUC's way of dealing with the EMF/health issue in light of the present uncertainty. Staff considers incorporation of these field srength-specific design measures as constituting compliance with present CPUC policy. The effectiveness of these field-reducing measures would in each case be reflected in the operational-phase field intensities measured during operation of the line in question. These field intensities could be estimated using established methods and later compared with the actual fields around the operating line. The electric fields are most commonly measured in units of kilovolt/meter (kV/m) while the magnetic fields are measured in units of milliGauss or mG. Measured field strengths could be used to assess each operating line for incorporation of the applicable field-reducing measures.

SETTING

The electricity from the proposed Russell City Energy Center (RCEC) will be delivered to the Pacific Gas and Electric (PG&E) power grid through a new 1.1-mile overhead 230 kV transmission line extending from the project's on-site switchyard to PG&E's Eastshore Substation to the east. According to information from the applicant, Calpine/Bechtel Joint Development (or Calpine/Bechtel), this connecting line will be a double-circuit 230 kV transmission line to be designed and built according to PG&E practices reflecting compliance with applicable laws, ordinances, regulations and standards or LORS (Calpine/Bechtel 2001a, pages 6-24 and 6-47 through 6-50).

As discussed by the applicant (Calpine/Bechtel 2001a, pages 2-1, 6-1,6-2, 8.6-7, 8.6-13 and 8.9-1), the proposed plant site is a 14.7-acre land parcel at the west end of Enterprise Avenue in the City of Hayward, Alameda County, California. This site and the route of the project's transmission line are within the city's Industrial Corridor with relatively few residences within one-mile radius of the project's property lines. The nearest residences are approximately 0.82 miles away on Industrial Boulevard, meaning that the residential power line field exposure at the root of the present health concern would be relatively insignificant for this project. The only exposure of potential significance would be to workers in facilities and businesses in the project area.

According to information from the applicant (Calpine/Bechtel 2001a, pages 6-1, 6-2, and 6.5), the proposed site was chosen in part for its proximity to existing area 115 kV and 230 kV line corridors, which the project's line will share on its way for connection to the Eastshore Substation. Such corridor sharing is in keeping with present state policy of on transmission line routing. In the proposed routing scheme, the line will exit from the project's switchyard and extend northeast for the relatively short (600-ft) distance (within its own 100-ft right of way) until it intersects with the right-of-way of the existing 115 kV Eastshore-Grant line, which it will then share for a distance of 4500 feet. At the end of this shared corridor, the line would exit and travel 500 feet to the northeast for connection to the Eastshore Substation, which will be modified to accommodate its entry. This last (500-ft) segment will utilize the existing corridor for two 230 kV San Mateo-Contra Costa (East Shore) lines.

ANALYSIS OF IMPACTS

ENVIRONMENTAL CHECKLIST	Potentially Significant Imput	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
TRANSMISSION LINE SAFETY AND NUISANCE -- Would project operation:				
a) Pose an aviation hazard to area aircraft?			X	
b) Lead to interference with radio-frequency communication?		X		
c) Pose a hazardous or nuisance shock hazard?		X		
d) Pose a fire hazard?		X		
e) Expose humans to higher electric and magnetic field levels than justified by existing knowledge?		X		

DISCUSSION OF IMPACTS

A. Aviation Hazard

As noted by the applicant (Calpine/Bechtel 2001a, page 6-46) the nearest airport to the project site is the Hayward Executive Airport approximately 0.69 miles to the northeast. Despite this relative closeness, the north-to-northeast orientation of the airport's runway would place the project and its transmission line (with a maximum height of 115 feet) away from the area of potential collision hazard to utilizing aircraft.

Furthermore, most of the line will be located within the rights-of-way of existing PG&E lines that do not pose such a hazard. At approximately 2.76 miles to the southeast, the St. Rose Hospital Heliport is located too far away from the project and its transmission line for them to pose an aviation hazard to the utilized helicopters.

B. Audible Noise and Radio Frequency Interference

As detailed in the information from the applicant (Calpine/Bechtel 2001a, pages 6-31 through 6-45 and Appendix 6-L), the proposed transmission line will be designed built, and maintained to minimize the features responsible for line-related audible noise and interference with radio or television reception electric around the right-of-way it will occupy alone and the ones it will share with existing PG&E lines. The potential for such electric field-related impacts (and related complaints) is further minimized by the general lack of residences in the line's field impact area. FCC regulations require the applicant to mitigate all interference-related complaints for which staff recommends a specific condition of certification (TLSN-2) in the unlikely event of occurrence.

C. Fire Hazard

The applicant (Calpin/Bechtel 2001a, page 6-47) intends to comply with the GO-95 requirements, which will ensure that the proposed line is adequately located away from trees and other combustible objets to prevent contact-related fires or minimize such fires when they occur. The potential for such fires is further minimized by the general absence of trees, brush or other large combustible objects within the line's route of mostly industrial uses. Staff recommends two conditions of certification (TLSN-1 and TLSN-4) to ensure implementation of the necessary preventive measures.

D. Shock Hazards

The applicant (Calpine/Bechtel 2001a pages 6-45 and 6-46) intends to comply with the requirements of applicable regulations and standards intended to prevent hazardous or nuisance shocks to workers or the general public. Staff's recommended conditions of certification, TLSN-1 and TLSN-2 will ensure such compliance.

E. Electric and Magnetic Exposure

The applicant (Calpine/Bechtel 2001a, pages 6-32 through 6-45) has presented the details of their field reducing design and operational plan for staff-required compliance with CPUC requirements. This plan includes specific measures to (a) decrease the spacing between conductors thereby ensuring maximum field cancellation, (b) measures to minimize line current thereby reducing field strength and (c) measure to utilize current flow patterns for maximum field cancellation. Staff finds this plan to be acceptable.

To verify the effectiveness of these field-reducing measures, the applicant (Calpine/Bechtel 2001a, pages 6-32 through 6-44, and Appendix 6-M) presented exposure estimates that reflect the contribution of the project's line to the area's operational phase field exposures. These estimates were provided for the line's

magnetic fields since magnetic fields are at the root of the present health concern over EMF exposure. Staff established from such estimates that the additional power from the proposed project would increase magnetic field levels (in the middle of the right-of-way) from a maximum of 55.54 mG to a maximum of 83.8 mG. The increase at the edge of the right-of-way would be from a maximum of 32 mG to a maximum of 7.36 mG. These field strengths reflect the interactive effects of fields from the proposed line and the lines in its proposed rights-of-way. In the locations of maximum field cancellations, the project-related power addition would decrease the magnetic fields levels from 13.82 mG to 10.28 mG at the edge of the right-of-way. These field strength estimates are much lower than established by the few states with specific regulatory limits and reflect the effectiveness of the applicant's intended measures. Staff's recommended condition of certification (TLSN-3) is intended to verify achievement of the field strength reduction assumed by the applicant.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

CITY (7-27)-2

The City of Hayward is concerned about the potential impacts of the project's electric fields on electrical devices (such as the City's Supervisory Control, Alarming, and Data Acquisition system and other communications equipment) that are located in nearby area offices. The location of such equipment would be beyond the edge of the right-of-way where operational-phase electric field strengths were estimated by the applicant as too low for such impacts (Calpine/Bechtel 2001a pages 6-25 through 6-46, and Appendix 6-K). Staff agrees with the applicant that such field-related interference would be unlikely. Since FCC regulations require the applicant to mitigate all such interference, the applicant would be responsible for appropriate corrective action in the case of such complaints. The requirement for such action is specified in a specific condition of certification (TLSN-2). The city is also concerned about the potential impacts of project-related field exposure on area industrial and municipal workers. Staff does not consider such exposures to be of health significance in light of present scientific knowledge on field effects and underlying biological mechanisms.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the proposed line will be designed and operated in compliance with all applicable health- and safety-based LORS. The following conditions of certification are recommended to ensure incorporation of the design and operational measures necessary.

PROPOSED CONDITIONS OF CERTIFICATION

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

Thirty days before starting construction of the transmission line or related structures and facilities, the project owner shall submit to the CPM a letter signed by a California registered electrical engineer affirming compliance with this requirement.

TLSN-2 The project owner shall ensure that every reasonable effort will be made during project operations to identify and correct, on a case-specific basis, any complaints of interference with radio or television reception or the functioning of any electrical devices or equipment.

Verification: The project owner shall maintain written records for a period of five years, of all complaints of all such complaints together with the corrective action taken in response to each complaint. Complaints not leading to a specific action, or for which there was no resolution should be noted and explained. The project owner and also the complainant, if possible shall sign the record, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action.

All reports of line-related complaints shall be summarized for the project-related lines and included during the first five years of plant operation in the Annual Compliance Report.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the line before and after they are energized. Measurements should be made at representative points along the edge of the right-of-way for which field strength estimates were provided.

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 right-of-way of the project-related lines are 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: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report.

TLSN-5 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards.

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

Calpine/Bechtel Joint Development (Calpine/Bechtel) 2001a. Application for Certification, Russell City Energy Center (01-AFC-7). Submitted to the California Energy Commission on May 22, 2001.

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

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August, 1998.

VISUAL RESOURCES

Testimony of Eric Knight

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether construction and operation of the Russell City Energy Center (RCEC) would cause visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards. The determination of the potential for visual impacts resulting from the proposed project is required by the California Environmental Quality Act (CEQA)

This analysis includes the following:

- Description of applicable laws, ordinances, regulations and standards;
- Assessment of the visual resources setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting;
- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;
- Conclusions; and
- Proposed Conditions of Certification

A summary of the visual resources analysis is presented in table form in **Visual Resources Appendix VR-1**. A discussion of the visual resources analysis methodology is provided in **Appendix VR-2**. A lighting complaint resolution form is provided in **Appendix VR-3**. **Appendix VR-4** presents the visual resources figures.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

The proposed project, including the linear facilities, is not located on federally administered public lands and is not subject to federal regulations pertaining to visual resources.

STATE

None of the roadways in the project vicinity, including State Route (SR) 92, are eligible or designated State Scenic Highways (State Scenic Highway System Web Site). Therefore, no state regulations pertaining to scenic resources are applicable to the project.

LOCAL

The proposed power plant and linear facilities are located within the City of Hayward. Therefore, the project would be subject to local laws, ordinances, regulations, and

standards (LORS) pertaining to the protection and maintenance of visual resources. LORS applicable to the proposed project are found in the Hayward General Plan and Zoning Ordinance.

Applicable LORS in the Hayward General Plan regarding visual resources are found in the City Image and Urban Design Elements. The Hayward Zoning Ordinance contains several pertinent LORS related to visual resources. Land uses within the Industrial Zoning District are subject to the "Minimum Design and Performance Standards," which establish requirements for architectural design, fences, signs, outdoor storage, lighting, and landscaping. An assessment of the project's consistency with the relevant LORS is presented in a later section of this analysis.

PROJECT DESCRIPTION

The following section describes the aspects of the proposed project that may have the potential to cause adverse impacts to visual resources. Please refer to the **PROJECT DESCRIPTON** section of the Final Staff Assessment (FSA) for a more complete discussion of project details.

POWER PLANT AND ARCHITECTURAL TREATMENT

The major visible components of the power plant include the two heat recovery steam generator (HRSG) units and the two HRSG exhaust stacks. The HRSG units and exhaust stacks would be 90 feet tall and 145 feet tall, respectively. The highest relief valves and vents on the HRSG units would extend to a height of 122 feet. In recognition of the RCEC's highly visible location near the edge of the baylands and at the SR 92 gateway to Hayward, Calpine/Bechtel has committed to implementing an architectural treatment intended to improve the appearance of the power plant and make it a distinctive visual landmark (Calpine/Bechtel 2001a). The proposed architectural screening structure (the "Wave") that would enclose the HRSG units and stacks was designed by the Hillier Group, an international architectural firm specializing in the design of power plants and other major infrastructure facilities. The architectural treatment (see **VISUAL RESOURCES Figure 1**) was designed in consultation with City of Hayward staff and elected officials, and was endorsed by several members of the City Council and the public present at an April 17 workshop held by the City (Calpine/Bechtel 2001a). The Wave structure would be 135 feet tall, 222 feet long, and 180 feet wide and would be constructed of a tubular steel space frame with open, stainless steel mesh spanning the members of the space frame. The steel mesh is intended to create "a semi-transparent to opaque surface that will, under some lighting conditions, screen the plant's equipment, and under others, reveal it" (Calpine/Bechtel 2001a, p. 8.13-13). The intent of the steel space frame and mesh is to "simplify the complexity of the power plant's equipment and create a unified visual element that has sculptural quality." The wave shape is intended to "create a sense of motion and to serve as a distinctive landmark element." In workshops and correspondence, the City has insisted that the architectural design for the RCEC be unique and distinctive (Armas 2001). The City believes that the proposed Wave structure fulfills this objective, and supports the Wave as the preferred design treatment for the RCEC.

The project would also include a plume-abated 10-cell cooling tower that would be 64 feet tall and 473 feet long. The Applicant also proposes architectural screening for the cooling tower. In regard to plumes the AFC states (page 8.13-14): "The specific design conditions for the RCEC project will be developed to provide the plume abatement capability to restrict plume formation so visible plumes occur only under the most extreme meteorological conditions. With the design being used for the HRSGs, water vapor plumes will not be seen emanating from the plants HRSG stacks, under nearly any circumstances." The results of staff's computer modeling of the project's potential for visible plume formation are discussed later in this analysis.

The Applicant has committed to providing "appropriate" architectural treatment, consistent with the City's design guidelines for industrial districts, to the one-story buildings fronting on Whitesell Street that would contain the administrative offices, warehouse, and water treatment laboratory (Calpine/Bechtel 2001a).

ADVANCED WATER TREATMENT PLANT

The project would include an advanced water treatment plant (AWT) for treatment of secondary effluent from the City of Hayward Water Pollution Control Facility (WPCF) for both cooling water and process makeup water for the HRSG units. The AWT structures to be located at the RCEC site, including the water storage tanks, would range in height from 20 to 42 feet tall. The solids handling portion of the AWT, initially proposed at the RCEC site, would be located approximately 500 feet north of the site on WPCF property, northeast of an area where sludge is currently spread out to dry and stacked into large piles 10-15 feet high (Calpine/Bechtel 2001c). The offsite facilities include a 25-foot tall chemical water and dewatering area building, a 47-foot tall, 18-foot diameter lime silo, and 42-foot tall and 65-foot wide sludge loading bays. Architectural treatment would be applied to the outside of the major AWT structures, particularly those facilities that would face Enterprise Avenue, to resemble the façade of an office or light industrial building (Calpine/Bechtel 2001d).

LINEAR FACILITIES

Transmission Line

The proposed 230-kV double-circuit overhead transmission line (supported by steel pole structures ranging from 110 to 125 feet tall) would generally run parallel to the existing East Shore-Grant 115 kV transmission line. The transmission line would connect to the East Shore Substation located about 1.1 mile southeast of the RCEC site and south of SR 92. The route of the proposed transmission line would traverse industrial properties and parking lots within Hayward's Industrial Corridor. The most visible portion of the line would be its crossing of SR 92 near the Clawiter Road exit. The transmission line would be visible from the roads it would traverse and from the industrial uses along these roads, which include Whitesell Street, Enterprise Avenue, Breakwater Avenue, Eden Landing, Investment Road, and Arden Road. Visual quality along the proposed transmission line route ranges from low to low-to-moderate.

Natural Gas Supply, Water Supply, and Wastewater Pipelines

The proposed 0.9-mile-long natural gas supply pipeline would connect to a PG&E gas distribution line that runs along the Union Pacific Railroad Company (UPRR) right-of-

way east of Clawiter Road. The proposed underground gas pipeline would extend west from the interconnection point along the south property line of the Berkeley Farms facility located at Clawiter Road and Enterprise Avenue. After crossing Clawiter Road, the gas line would extend west along Enterprise Avenue to the RCEC site. Except for the occasional aboveground warning signs, such as at the Clawiter Road crossing, the underground gas pipeline would not be visible during operation.

Short water supply and wastewater return pipelines would be constructed between the project site and the WPCF located directly across Enterprise Avenue from the project site. Because the water pipelines would be buried, these pipelines would not be noticeable.

Because the Applicant would restore surface conditions after completing pipeline construction, operation of the pipelines would not cause significant visual impacts. However, pipeline construction activities, materials, and personnel would be visible to travelers and occupants of industrial buildings along Clawiter Road and Enterprise Avenue. Due to the industrial nature of the pipeline routes, visual quality is low.

CONSTRUCTION LAYDOWN AREAS

The AFC identifies three potential areas that could be used as construction laydown and worker parking areas during the construction period:

- 3600 Enterprise Avenue – a four-acre site located directly across Whitesell Street from the RCEC site and currently used as a truck terminal;
- 3548-3600 Depot Road – a 10-acre industrial property located north of the project site; and
- Vacant land surrounding the East Shore Substation

The construction laydown/parking areas primarily would be visible to motorists along Enterprise Avenue, Whitesell Street, and Arden Road, and to occupants of industrial buildings in the vicinity of these sites. Due to the industrial character of these sites, visual quality is low.

SETTING

REGIONAL SETTING

The proposed RCEC would be located in the City of Hayward, a community located along the eastern shore of San Francisco Bay in Alameda County. The regional setting of the project includes the East Bay Hills to the east and the Hayward Regional Shoreline ("baylands") and San Francisco Bay to the west. The baylands immediately to the west of the RCEC site constitute a vast open space area that includes saltwater, brackish, and fresh water marshlands and mudflats supporting stands of tall cord grass. Much of the area in the baylands is managed for wildlife protection and public access by the East Bay Regional Park District (EBRPD) and the Hayward Area Recreation and Park District (HARD). Visitor facilities include the Hayward Shoreline Interpretive Center (managed by HARD) and a system of trails through the area, including a portion

of the San Francisco Bay Trail. The Hayward Shoreline Interpretive Center and the trail system provide vista views of San Francisco Bay and the Coast Range, the baylands, the East Bay Hills, and Mt. Diablo, which is located northeast of the project area and rises above the hillsides to an elevation of 3,849 feet.

PROJECT AREA SETTING

The proposed RCEC site is located on 14.7 acres within the City of Hayward Industrial Corridor, at the corner of Enterprise Avenue and Whitesell Street. A mix of industrial uses is located within the Industrial Corridor, including business parks, manufacturing facilities, fabrication shops, warehouses, and automotive salvage yards. The WPCF is located directly across Enterprise Avenue from the power plant site. The most visually prominent facility in the Industrial Corridor is the Rohm and Haas paint polymer facility, which has a 180-foot-tall stack and is located about 0.25 mile southeast of the RCEC site. Except for the Rohm and Haas facility, much of the development in the Industrial Corridor is horizontal in character, consisting of one- and two-story structures. The business parks in the Industrial Corridor, such as the facility located to the south of the RCEC site, consist of newer, one-story tilt-up structures surrounded by landscaping. Many of the streets within the Industrial Corridor, including portions of Whitesell Street and Enterprise Avenue, are landscaped with mature street trees. Several residences remain within the Industrial Corridor along McCone Avenue, Dunn Road, and Industrial Road, located about 0.8 mile north-northeast of the RCEC site. The proposed project structures would not be visible from these residences due to intervening structures.

The RCEC site is generally level, ranging in elevation from approximately 5 to 12 feet above sea level. Four, 228-foot-tall KFAX radio towers and a one-story shed currently occupy the western portion of the site. Vegetation on this portion of the site consists of grass, weeds, and a row of shrubs along the west property boundary. The visual quality of this portion of the site is low. Runnels Industries, a sandblasting and painting operation, is currently located on the eastern portion of the site. A metal warehouse, trailer, several one-story structures, and utility poles currently occupy this portion of the site. Visual quality is very low.

View Areas and Key Observation Points

VISUAL RESOURCES Figure 2 generally identifies the areas from which the project would be visible, also called the project viewshed. The power plant structures, as well as the AWT facilities (onsite and offsite structures), would be most visible in views across the open baylands located to the northwest, west, and southwest of the project site. Unobstructed views of the RCEC would be available to eastbound motorists on the Hayward-San Mateo Bridge and SR 92, and to recreational users of the Hayward Regional Shoreline and visitors to the Hayward Shoreline Interpretive Center.

The project structures would be intermittently visible from the industrial areas to the north, south, and east due to intervening buildings and trees. From the westbound lanes of SR 92, the RCEC would be intermittently visible due to existing structures and trees, within motorists' normal cone of vision, starting at about the Industrial Boulevard exit to the Clawiter Road exit. Project structures would not be substantially visible from the commercial and residential areas to the east of the Industrial Corridor. Residential uses to the east of the project site include a single-family dwelling located on Depot

Road, east of Clawiter Road about 0.82 miles northeast of the RCEC site; and the Waterford Apartments, located along Industrial Boulevard, south of Depot Road, about 0.91 miles to the east of the site. Residential communities also are located to the east of Industrial Boulevard. Most views of the proposed RCEC from the residences east of Clawiter Road and Industrial Boulevard would be completely screened due to intervening buildings and trees. The project would be visible from residences located in the East Bay Hills. However, from these more distant viewpoints (approximately 3.7 miles from the site), the project would appear relatively small in comparison to the wide field of view and not substantially noticeable in the context of the intensely urban nature of the foreground and middleground views.

The Applicant, in consultation with Energy Commission Staff, selected seven key observation points (KOPs) to characterize the existing visual setting within which the proposed project would be evaluated. **VISUAL RESOURCES Figure 3** shows the location and view direction of the seven KOPs selected for the proposed project. At each KOP, a visual analysis was conducted (a summary is presented in **Visual Resources Appendix VR-1**). The following discussion provides an assessment of the overall visual sensitivity at each KOP. Overall visual sensitivity takes into account existing landscape visual quality, viewer concern, and overall viewer exposure, which considers visibility, distance zone, number of viewers, and duration of view.

KOP 1: Industrial/ Office Park

KOP 1 was established to represent views of the RCEC site from the industrial office park located south of the project site. **VISUAL RESOURCES Figure 4A** depicts the existing view of the RCEC site (at a distance of approximately 500 feet) from the parking lot of the building immediately south of the site. The viewpoint is located adjacent to a pathway that provides access to the building's rear entrance and outdoor patio area.

Visual Quality

A parking lot, fence, warehouse, and the four KFAX radio towers dominate the view from KOP 1 toward the RCEC site. The East Bay Hills are visible in the background but have a low profile. Facilities at the WPCF are visible, as are street trees planted along Enterprise Avenue. The view in the direction of the site is fairly open in character. Visual quality is considered low in the direction of the site.

Viewer Concern

Industrial area workers anticipate a highly modified landscape. However, the area of KOP 1 is located on the periphery of the Industrial Corridor, and views in the direction of the site (and to the west) are open in character. Furthermore, development in the Industrial Corridor is subject to minimum design standards, such as setback landscaping, indicating an increased level of viewer concern. For these reasons viewer concern is rated moderate.

Viewer Exposure

The windows of the building at KOP 1 are partially blocked by trees and hedges. It is likely that project structures would be visible to building occupants whose offices are

located along the windows facing the project site. Ground level views of the project site are blocked by the fence located along the property's northern boundary. However, views of the project basically would be unobstructed from the path leading to the rear entrance and the outdoor patio area. Thus, visibility from KOP 1 is high. The project would be located in the near foreground of the view from KOP 1. The parking lot contains spaces for 200 cars (Calpine/Bechtel 2001a), suggesting a moderate number of viewers. Occupants of the building primarily would see the project while walking to and from their cars, and while using the outdoor patio/break area, so view duration would be low to moderate. Overall viewer exposure would be moderate to high.

Overall Visual Sensitivity

In spite of overall viewer exposure being moderate to high, the overall visual sensitivity of the setting viewed from the area of KOP 1 is moderate due to the low visual quality and moderate viewer concern.

KOP 2: Hayward Shoreline Interpretive Center

KOP 2 was established at the Hayward Shoreline Interpretive Center, which is located on Breakwater Avenue about 0.73 miles southwest of the RCEC site, to show the view of the project site available to visitors to the Interpretive Center. An elevated wooden deck surrounds the Interpretive Center. The deck, which on the north side of the building is equipped with a set of bleachers and an approximately 15-foot tall "tower," provides vantage points for views across the baylands. **VISUAL RESOURCES Figure 5A** shows the existing view of the site from the deck in front of the main entrance to the Interpretive Center.

Visual Quality

The open baylands in the foreground to middleground dominate the view from KOP 2 toward the site. Topographic variation is provided by the East Bay Hills in the background. In the far background is Mt. Diablo, a regional landmark. With a summit elevation of 3,849 feet, Mt. Diablo is located prominently in the view toward the site. The KFAX radio towers and the industrial structures that give the middleground of the view a cluttered appearance degrade visual quality. In addition, the light, reflective surfaces of the industrial structures contrast highly with the setting. Visual quality is considered moderate to high.

Viewer Concern

Visitors to the Hayward Shoreline Interpretive Center come to observe and appreciate nature. The building is designed to provide views across the baylands from its observation decks and tower. For these reasons, viewer concern at KOP 2 is rated high.

Viewer Exposure

The view from KOP 2 toward the site is unobstructed, so visibility is high. The project site is located in the middleground distance from KOP 2. Visitation to the Hayward Shoreline Interpretive Center is high. Annually, the Interpretive Center serves approximately 4,500 school children who visit the center with their classes for special programs, 1,000 members of the general public who participate in weekend programs,

and another 9,000 members of the public who stop by before heading out to use the trails (Calpine/Bechtel 2001a). For those visitors who stop by before heading out to use the trails, view duration at KOP 2 would be low. For those visitors who participate in programs at the Interpretive Center, view duration would be moderate. Overall, viewer exposure at KOP 2 would be moderate to high.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from KOP 2 is moderate to high as a result of the moderate to high visual quality, high viewer concern, and moderate to high overall viewer exposure.

KOP 3: Hayward Shoreline Regional Park

KOP 3 was established in the Hayward Regional Shoreline, northwest of the project site on the footbridge that crosses Cogswell Marsh. **VISUAL RESOURCES Figure 6A** shows the existing view from KOP 3. This viewpoint, which is located about 1 mile from the RCEC site, was selected to represent views of the project site that would be available to users of the shoreline trails.

Visual Quality

The foreground to near middleground view from KOP 3 is dominated by open water and marshes. The industrial structures in the Industrial Corridor, including the prominent Rohm and Haas facility, give the far middleground of the view a cluttered appearance and contrast highly with their setting. The KFAX radio towers are barely discernible at this distance. The East Bay Hills and Mt. Diablo provide topographic variation and visual interest in the background. Visual quality is considered moderate to high.

Viewer Concern

The network of trails in the Hayward Regional Shoreline provides opportunities for the observation and appreciation of the natural environment. Trail users anticipate an urban landscape to the east of the baylands, however, any additional blockage of views of the East Bay Hills would be perceived as an adverse visual change. Viewer concern for trail users is rated high.

Viewer Exposure

The view from KOP 3 toward the site is partially obstructed by a warehouse, so visibility is moderate to high. The project site is located in the middleground distance zone from KOP 3. It is estimated that the trails in the Hayward Regional Shoreline Park are used by 200 to 250 walkers, runners, and bicyclists per day (Calpine/Bechtel 2001a), so the number of viewers is high. The duration of view would be moderate. Overall, viewer exposure would be moderate to high.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from the area of KOP 3 is moderate to high as a result of the moderate to high visual quality, high viewer concern, and moderate to high overall viewer exposure.

KOP 4: State Route 92 at Hayward-San Mateo Bridge Toll Plaza

KOP 4 was established on SR 92, near the toll plaza at the east end of the Hayward-San Mateo Bridge. **VISUAL RESOURCES Figure 7A** shows the existing view of the RCEC site across the open baylands that is available to eastbound motorists. The viewpoint is located 1.44 miles southwest of the project site.

Visual Quality

The pavement of the highway and vehicles dominate the immediate foreground of the view from KOP 4. Other landscape elements visible to motorists on SR 92 at this location include the baylands in the near middleground, industrial structures in the far middleground, and the East Bay Hills in the background. Mt. Diablo is prominent in the far background. Overall, visual quality is considered moderate.

Viewer Concern

The entrance into Hayward from the Hayward-San Mateo Bridge is formally recognized as a "gateway" in the General Plan. Eastbound motorists anticipate a highly modified landscape upon entering Hayward, however, any additional blockage of the East Bay Hills would be perceived as an adverse visual change. Viewer concern is rated moderate.

Viewer Exposure

Because the view toward the project site is unobstructed, and the site is within motorists' normal cone of vision, visibility is high. The project site is located within the middleground distance zone from KOP 4. The Average Daily Traffic for this segment of SR 92 is 93,000 vehicles per day in the eastbound lanes (Calpine/Bechtel 2001a), so the number of viewers is high. Because the site is visible from the bridge, and motorists would be travelling toward the site, the duration of view is moderate. Overall, viewer exposure is considered to be moderate to high.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from KOP 4 is moderate in spite of the moderate to high overall viewer exposure because of the moderate visual quality and moderate viewer concern.

KOP 5: Cabot Boulevard at Depot Road

KOP 5 was established on Cabot Boulevard at its intersection with Depot Road to represent views of the project site from the portion of the Industrial Corridor located directly to the north. **VISUAL RESOURCES Figure 8A** shows the existing view from KOP 5, a viewpoint located about 0.38 miles north of the project site.

Visual Quality

A street, fence, and some trees dominate the foreground view at KOP 5. Industrial structures, utility poles, and the KFAX radio towers are visible in the background. Visual quality is low.

Viewer Concern

The predominate viewers in the area of KOP 5 would be people travelling through or working in the Industrial Corridor. Viewers anticipate a highly modified landscape dominated by industrial character. Viewer concern is low.

Viewer Exposure

The project would be partially obstructed by a fence along Depot Road, so visibility would be moderate. The project would be located within the foreground distance zone. The number of viewers would be moderate, and the duration of view would range from low to moderate. Overall, viewer exposure would be moderate to high.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from this location is low to moderate in spite of the moderate to high overall viewer exposure because of the low visual quality and low viewer concern.

KOP 6: Residential Areas East of Industrial Boulevard

KOP 6 was established on Laguna Drive, west of Mohr Drive, about 0.9 mile northeast of the RCEC site to represent views toward the project site from the residential area located east of Industrial Boulevard and north of Depot Road. **VISUAL RESOURCES Figure 9** shows the existing view from KOP 6, a viewing area where the foreground is not blocked by intervening houses, allowing ground-level views in the direction of the site and of the top approximately 35 feet of the KFAX radio towers. There are about 34 two-story houses along Laguna Drive and Continental Avenue, a number of which have views of the KFAX radio towers.

Visual Quality

The view is suburban residential in character and of moderate quality.

Viewer Concern

Because of the sensitivity with which people regard their places of residence, viewer concern is rated high for KOP 6.

Viewer Exposure

Because existing buildings and trees would screen most views toward the project from the area of KOP 6, visibility would be low. The project site is located within the middleground distance zone from KOP 6. The number of residences that would potentially have views of the project would be low. Because views of the project would be from residences, view duration would be high. Overall, viewer exposure would be moderate.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from this location is moderate in spite of the high viewer concern because of the moderate visual quality and moderate overall viewer exposure.

KOP 7: Transmission Line Crossing of SR 92

KOP 7 was established on SR 92, west of the Clawiter Road exit (**VISUAL RESOURCES Figure 10A**) to show the existing view of the East Shore-Grant 115 kV transmission line and lattice tower available to the 93,000 eastbound motorists who travel this segment of the highway each day. The new transmission tower would be located adjacent to the existing tower.

Visual Quality

The roadway, overpass, and lattice transmission tower dominate the foreground to middleground views. Visual interest is provided by several clusters of trees along the side of the roadway and the East Bay Hills in the background. Visual quality is rated low to moderate.

Viewer Concern

Eastbound motorists anticipate a highly modified landscape upon entering Hayward. Viewer concern is rated low to moderate.

Viewer Exposure

Because views of the new transmission tower would be unobstructed, and the tower is located within motorists' normal cone of vision, visibility is high. The tower would be located within the foreground distance zone. The number of viewers would be high and the duration of view would be moderate. Overall, viewer exposure would be high.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from KOP 7 would be moderate in spite of the high overall viewer exposure because visual quality and viewer concern are low to moderate.

IMPACTS ANALYSIS

ENVIRONMENTAL CHECKLIST

VISUAL RESOURCES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?		X		
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?		X[1]		
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?		X		

DISCUSSION OF DIRECT IMPACTS

A summary of the impact analysis is presented in a table in **Visual Resources Appendix VR-1**. The impact assessment methodology and significance criteria utilized in this study are described in detail in **Appendix VR-2**. The following discussion explains the responses to the questions in the environmental checklist.

A. Scenic Vistas

As explained earlier in this analysis, views of the marshes, San Francisco Bay, the Coast Range across the bay, and the East Bay Hills are available from the decks surrounding the Hayward Shoreline Interpretive Center. Mt. Diablo, a California State Historic Landmark (#905) and registered National Landmark, is clearly visible in the far background about 20 miles to the northeast. The project, which is in a direct line of sight with Mt. Diablo from the Hayward Shoreline Interpretive Center, would almost completely block the view of the mountain currently available from the Interpretive Center. **VISUAL RESOURCES Figure 5B** is a visual simulation of the project, as it

[1] Because construction of the RCEC would require the removal of the four KFAX radio towers that presently occupy the site, Energy Commission staff conducted an analysis of the environmental impacts of relocating the towers (see Appendix B to the FSA). This was done even though the City of Hayward (acting as a lead agency under CEQA since they are responsible for granting a conditional use permit to allow for the relocation) had already certified a Mitigated Negative Declaration. In the Mitigated Negative Declaration, the visual impacts of the radio towers were found to be less than significant with mitigation incorporated. Energy Commission staff found that the relocated towers would continue to cause significant adverse visual impacts after mitigation since in staff's opinion the identified mitigation would not substantially reduce the towers' high contrast and moderate to high dominance as viewed from the West Winton Avenue entrance to the Hayward Regional Shoreline Park.

would appear from the deck leading to the entry to the Hayward Shoreline Interpretive Center. About three times per week, school children visit the Interpretive Center as part of an educational program. The only time Mt. Diablo is pointed out to school children visiting the Interpretive Center is when the children are taken up on the tower located on the north side of the building (Koslosky 2001). According to the Supervisor of Naturalist Programs at the Interpretive Center, it would be a "shame" if the view of Mt. Diablo were not available from the Interpretive Center. Because the tower is located to the west of the location where the photograph was taken for KOP 2, staff estimates that the amount of Mt. Diablo that would be blocked from view from the tower may be even greater than that shown in **VISUAL RESOURCES Figure 5B**. Staff considers the project's potential to substantially block the view of Mt. Diablo, a State Historic Landmark, from the highly sensitive Hayward Shoreline Interpretive Center to be a significant visual impact.

Mitigation Measures

In spite of the project's potential to block the view of Mt. Diablo from the Interpretive Center, the AFC identified the visual impact to KOP 2 as less than significant. However, the Applicant committed to donating funds to the HARD for "providing benches and other amenities on its trail system" where views toward Mt. Diablo would not be affected by the project (Calpine/Bechtel 2001a, p. 8.13-20). In data requests and at the workshop on the Preliminary Staff Assessment, staff requested that the Applicant develop a specific proposal describing the types and locations of trailside amenities that could be provided to compensate for the view blockage of Mt. Diablo. On December 21, 2001, the Applicant submitted their mitigation plan. The area from where views of Mt. Diablo would be interrupted is limited to an approximately 600-foot segment of trail that is located in front of the Interpretive Center (**see VISUAL RESOURCES Figure 11**). The plan calls for the installation of benches, information kiosks, and other amenities at two points on the trail in close proximity to the Interpretive Center where views toward Mt. Diablo would be unobstructed. Please refer to **VISUAL RESOURCES Figures 12 and 13** for conceptual designs of the proposed trailside amenities. The trail amenities are intended to offset the view blockage of Mt. Diablo from the Interpretive Center's deck "by providing convenient and attractive locations where the attention of Shoreline visitors can be directed toward Mt. Diablo."

At point "A" on Figure 11, which lies just east of the portion of the trail where views of Mt. Diablo would be blocked, the Applicant proposes to install benches and an information kiosk. The benches and kiosk would be located at the point where people parking along Breakwater Avenue start out on the trail. As stated in the plan, the intent of the information kiosk in this location is to provide trail users the opportunity to orient themselves to the regional landscape, of which Mt. Diablo is an element. The point marked "B" on Figure 11 lies just west of the trail segment where views of Mt. Diablo would be interrupted. At this location, the Applicant proposes a set of low panels for display of interpretive information related to Mt. Diablo and other important elements of the regional landscape. As stated in the plan, the purpose of this area would be to orient visitors, whether they are individuals or part of organized groups, as they make the transition from the Interpretive Center to the trail system to the west. One or two free-of-charge viewscopes could also be installed at this location to provide visitors who did not bring their own binoculars with magnified views of Mt. Diablo and other distant

landscape features. In addition to providing the trailside amenities, the Applicant would provide the HARD with a budget allowing them to research and prepare the interpretive materials that would be mounted on the kiosk and view panels.

Staff agrees with the Applicant that the proposed trail amenities would provide Shoreline visitors with an understanding and appreciation of Mt. Diablo that they would not necessarily arrive at on their own as part of their current experience of the view from the Interpretive Center deck. The HARD agrees that the Applicant's mitigation plan would mitigate for the loss of view of Mt. Diablo from the Interpretive Center (Willyerd 2002; see **Visual Resources Appendix VR-5**). Staff has incorporated the elements of the Applicant's mitigation plan into condition of certification **VIS-9**. With proper implementation of staff's proposed condition, the visual impact to a scenic vista would be reduced to a less than significant level. In addition to installing the trailside amenities, the Applicant has committed, as part of a Community Benefits Package, to donating $100,000 per year for 5 years to the HARD for youth programs that would help to enhance educational programs at the Hayward Shoreline Interpretive Center (Calpine/Bechtel 2001b).

B. Scenic Resources

As indicated in the previous discussion of LORS, there are no state-designated scenic highways within the proposed project viewshed. Furthermore, the project would not damage scenic resources such as trees, rock outcroppings, and historic buildings. Thus, the project would not result in significant adverse impacts under this criterion.

C. Visual Character or Quality

Project aspects that were evaluated in the assessment of Item C included project construction; the power plant and architectural screening structures; the electric transmission line, natural gas supply and wastewater discharge pipelines; and visible water vapor plumes.

Project Construction

Construction of the proposed power plant and linear facilities would cause temporary visual impacts due to the presence of equipment, materials, excavated piles of dirt, and workforce. Construction activities would include site clearing and grading, trenching, construction of actual facilities, and cleanup and restoration of the site and rights-of-way. Project construction (including the transmission line) would occur over an 18 to 21 month period. Construction of the gas pipeline would last about 2 to 3 months.

Mitigation Measures

The Applicant proposes to restore surface conditions after completing construction of the underground pipelines. The Applicant also proposes to surround the construction laydown sites with chain link security fences, and to reduce the visibility of the materials, equipment, and vehicles to be stored at these sites, the Applicant would install solid slats in fences abutting public streets. A chain link fence with wood slats already surrounds the East Shore Substation site. A chain link fence with plastic slats is located along the north boundary of the business park located immediately south of the RCEC site, which effectively screens ground level views of the site from the area of KOP 1. In

addition to the treatment proposed for the laydown areas, slats should be inserted in the chain link fence along the eastern boundary of the RCEC site to reduce the visibility of construction activities at the site to travelers along Whitesell Street. Furthermore, a 12-foot high fence with solid slats should be erected along the southwest corner of the RCEC site to substantially reduce the visibility of site construction activities to visitors to the freshwater portion of the Hayward Regional Shoreline located about 0.25 mile southwest of the site. Staff has proposed a condition of certification (**VIS-1**) incorporating these measures. The proper implementation of **VIS-1** would ensure that potential visual impacts associated with project construction remain less than significant.

Project Operation – Power Plant

VISUAL RESOURCES Figures 4B-D, 5B-D, 6B-D, 7B-D, and **8B** (Visual Resources Appendix VR-4) present visual simulations of the proposed power plant viewed from KOPs 1 through 5 respectively. For KOPs 1-4, simulations depict the project without landscaping, with landscaping 10 years after planting, and with landscaping 20 years after planting.[2]

KOP 1: Industrial Office Park

Contrast[3]

The major existing structures visible in the view from KOP 1 are a one-story warehouse building to the west of the RCEC site, a fence along the northern boundary of the parking lot, and the KFAX radio towers (which would be relocated from the site to allow for the project). The vertical, complex geometric forms of the proposed power plant and screening structure would cause a high level of contrast with the horizontal, simple forms of the existing structures in the view (see **VISUAL RESOURCES Figure 4B**). The straight lines of the power plant would be similar to the straight lines of existing structures. However, the curved lines of the screening structure would cause high contrast with the lines of existing structures. The light gray and dark blue colors of the project would contrast moderately with the predominant white color of existing structures and dark gray color of the parking lot. The texture of the power plant (which would be visible at this near foreground distance) is depicted in the simulation as smooth. However, in reality, the external surface of the HRSGs would be covered with a myriad of external piping and ancillary equipment, which would not appear consistent with the smooth surfaces of existing structures. Scale contrast would be high because the project structures would appear much larger than existing structures. In summary, the project would cause high levels of contrast with existing structures in regard to form, line, texture, and scale, and moderate contrast in regard to color.

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[2] Since preparation of the simulations, the U.S. Fish and Wildlife Service has determined that the Applicant's proposed tree pallette would provide perching opportunities for predatory birds. USFWS has provided a list of tree species that would be appropriate for the RCEC site. These trees would be considerably shorter than the trees the Applicant originally proposed; and, therefore, would hide less of the facility than is shown in the simulations.

[3] For KOP 1, the visual contrast discussion only addresses existing structures, and not landforms, since the view toward the site from KOP 1 is dominated by existing structures, such as the warehouse building, fence, radio towers, and parking lot.

Project Dominance

The project would be the major object in the view and would occupy a substantial part of the field of view. The proposed project would be spatially prominent since it would tower over the viewers at KOP 1 and would be back dropped against the sky. Overall project dominance would be dominant.

View Blockage

In the view from KOP 1, the East Bay Hills are visible but have a low profile. The project would substantially block the hillsides visible in the view from KOP 1. The project would block a considerable portion of the sky, as well as the trees along Enterprise Avenue. However, it would also block views of low quality structures at the WPCF. Because existing visual quality is low, the severity of view blockage experienced at KOP 1 would be considered low.

Overall Visual Change and Visual Impact Significance

The project would cause high visual contrast and dominance and low view blockage. Thus, the overall visual change would be moderate to high. Combined with the moderate overall visual sensitivity of the setting, the resulting impact would be significant.

Mitigation Measures

To screen views toward the project site from the area of KOP 1, the Applicant initially proposed to plant fast growing evergreen trees along the southern property line of the site such as Coast Redwood and Arizona Cypress. These trees were expected to reach heights of 80 feet and 40 feet, respectively, after 20 years. **VISUAL RESOURCES Figure 4C** depicts these trees as viewed from KOP 1 10 years after planting, and **VISUAL RESOURCES Figure 4D** depicts these trees 20 years after planting. However, the U.S. Fish and Wildlife Service (USFWS) will not allow the proposed trees since they could provide perches for predatory birds that could prey on endangered animal species that inhabit the adjacent marsh. The USFWS has provided a list of trees that would be appropriate for landscaping the RCEC site. The tallest of these trees, Italian cypress (*Cupressus sempervirens*) grows to about 60 feet (Sunset Western Garden Book). As illustrated in Figure 4C, the power plant and Wave structure would be substantially visible above the landscaping, continuing to contrast with and dominate the setting. Staff considers impacts lasting beyond 5 years to be long-term and significant. In addition to onsite landscaping (**VIS-2**), other mitigation proposed by staff to reduce the project's visual impacts are measures to ensure that the color and treatment of project structures (**VIS-3**), fences and walls (**VIS-5**), and project signs (**VIS-6**) do not substantially contrast with the setting, and that lighting (**VIS-4**) is controlled to reduce offsite glare. However, implementation of these measures would not reduce the visual impact to the area of KOP 1 to a less than significant level, since the moderate to high level of visual change (due to high visual contrast and project dominance) would not be sufficiently reduced.

In the PSA, staff suggested that the Applicant investigate the feasibility of planting additional evergreen trees offsite, closer to the viewers at KOP 1, to achieve a greater degree of screening of the project as viewed from this area. Planting locations

suggested by staff were the business park's parking lot (there are several existing planter boxes in the parking lot landscaped with ground covers only), and the setback area between the building and the parking lot, particularly the area near the outdoor patio and building entrance. In addition, staff suggested that the landscaping should be designed with the intent of maximizing the level of screening in the direction of the project site, without substantially blocking views of the open baylands to the west of the business park.

Measure 2 of the Applicant's Visual Mitigation Plan calls for the planting of 12 Australian willow (*Geijera parviflora*) trees in the existing, empty planting islands located in the parking lot immediately south of the project site (see **VISUAL RESOURCES Figure 14**). Australian willows are evergreen and would provide year round screening. The Applicant proposes to plant 24" box-size trees (about 8 to 9 feet in height) at the start of construction of the power plant. The trees are expected to be 18 to 19 feet tall in 5 years, and 30 feet tall at maturity. The Applicant prepared a visual simulation of the proposed trees at 10 years of maturity (see **VISUAL RESOURCES Figure 15**). Staff does not believe that these trees alone would reduce the impact to KOP 1 to a less than significant level because the project would remain substantially visible to viewers entering and leaving the building and to viewers at the outdoor patio area. The landowner has agreed to allow Calpine to plant the trees within the existing parking lot landscaping islands (Haag 2002; see **Visual Resources Appendix VR-5**). In addition, the landowner has agreed to consider the placement (on a case-by-case basis) of trees in the landscaped area around the buildings and patios at the parking lot's eastern border. The planting of trees in the parking lot and near the buildings at KOP 1 has been incorporated into staff's proposed condition of certification **VIS-10**. Full and effective implementation of **VIS-10** would be expected to reduce the visual impacts to KOP 1 to a level that would be adverse but not significant.

KOP 2: Hayward Shoreline Interpretive Center

Contrast with Landforms

The predominant landforms in the view from KOP 2 are the expansive baylands in the foreground and the East Bay Hills in the background (see **VISUAL RESOURCES Figure 5B**). The vertical form of the HRSG units and exhaust stacks (visible through the screening structure at this distance) would cause a high degree of contrast with the horizontal form of the baylands and the rolling, horizontal form of the hills. The straight and curved lines of the project would cause moderate to high contrast with the lines of the landforms. The gray and dark blue colors of the project would contrast moderately with the brown and green shades of the baylands and the medium blue of the hillsides. The project would appear much smaller than the landforms so scale contrast would be low. In summary, the project would cause high form contrast, moderate to high line contrast, moderate color contrast, and low scale contrast in comparison to landforms.

Contrast with Existing Structures

The vertical form of the project would cause a high level of contrast with the predominantly horizontal forms of the existing structures. The straight lines of the power plant would be similar to the lines of existing structures, but the curved lines of the screening structure would not be consistent with existing structures. The light gray

colors of the power plant would contrast moderately with the white color of existing structures. The dark blue color of the screening structure would cause a high level of contrast with the color of the existing structures (which highly contrast with the predominant landform colors). The project structures would appear much larger than existing structures so scale contrast would be high. In summary, the project would cause high form, line, color, and scale contrast with existing structures.

Project Dominance

The vast baylands in the foreground and middleground and the East Bay Hills in the background dominate the landscape. The project would dominate the other built structures in the Industrial Corridor and would appear taller than Mt. Diablo, which is located prominently in the view in the far background. The project would occupy a moderate part of the overall setting as viewed from KOP 2. The project would be spatially prominent since it would be situated in an exposed location in the landscape and would be partially back dropped by sky. Overall project dominance would be an intermediate level of co-dominant to dominant.

View Blockage

The project would increase blockage of the view of the surrounding hillsides somewhat, and it would substantially block the view of Mt. Diablo from the Hayward Shoreline Interpretive Center. Since the project would substantially block a landscape element of high visual quality, the severity of view blockage would be high.

Overall Visual Change and Visual Impact Significance

The project would cause high visual contrast with landforms and existing structures and moderate to high project dominance. In addition, view blockage would be high since the project would substantially block the view of Mt. Diablo from the Interpretive Center. Therefore, the degree of visual change would be high. Combined with the moderate to high overall visual sensitivity of the setting, the resulting impact would be significant.

Mitigation Measures

Staff recommends condition of certification **VIS-2**, requiring landscaping to screen views of the project's lower structures, and condition of certification **VIS-3**, requiring project structure colors and finishes to blend with the surroundings. However, implementation of **VIS-2** and **VIS-3** would not reduce the adverse visual impacts of the project to a less than significant level since the project would continue to cause high visual contrast with landforms, particularly the East Bay Hills, and substantially block the view of Mt. Diablo.

To achieve a greater degree of visual screening of the project at KOP 1, the Applicant proposes to plant trees offsite, closer to the viewers. However, it would not be desirable to plant trees nearer to viewers at KOP 2 since trees planted in close proximity to the Interpretive Center would block currently open sight lines to the baylands and East Bay Hills. Instead, the Applicant proposes in Measure 3 of their Visual Mitigation Plan to plant trees along the western edge of the Industrial Corridor to screen views of the industrial buildings and structures in the immediate vicinity of the project site. Hence, to compensate for the project's visual contrast with and dominance of the setting, this proposal would reduce the visibility of other highly contrasting and dominating structures

in the view from KOP 2 toward the project site. The highly reflective colors of the existing structures cause a high degree of contrast with the setting and degrade the visual quality of the view from KOP 2.

Measure 3 calls for the planting of a row of evergreen trees along the west edge of the Industrial Corridor, starting at the warehouse complex to the west of the RCEC site, and continuing southerly along the parking lot of the Whitesell Business Park (see **VISUAL RESOURCES Figure 14**). Additional trees would be planted on an existing berm from Breakwater Avenue north to Johnson Road to screen from view some of the unsightly industrial uses near SR 92. The trees would be planted relatively close together to create a dense screen and arranged in informal patterns with occasional breaks to impart a more natural appearance. The trees planted along the parking lot of the Whitesell Business Park would be pruned up as they grow so as to retain westward views from the parking area to the Shoreline open space. In the areas where the trees would be planted close to the blank walls of the warehouses, the trees would be allowed to take on a bush-like form to maximize their screening potential. The Applicant's plan calls for planting 24" box size trees, ranging in height from 6 to 10 feet at the time of planting. Within 5 years, the trees would range in height from 13 to 19 feet tall and would substantially screen views of the existing warehouse and industrial complex buildings. At maturity, the trees would range from 20 to 30 feet tall. Calpine would provide an appropriate level of irrigation and fertilization of the landscaping to ensure optimal tree growth, health, and appearance.

The City of Hayward owns the lands to the west of the RCEC site and from Breakwater Avenue to Johnson Road on which the trees would be planted. At the PSA workshop, the City showed its support for the tree planting by making a presentation of the conceptual proposal. The remainder of the planting area would be on three separate parcels. All of the landowners have agreed to allow Calpine to plant the trees on their properties (Haag 2002; Hanna 2002; Mead 2002; see **Visual Resources Appendix VR-5**). The Applicant's tree planting proposal for screening views of the warehouses and buildings in the Industrial Corridor has been incorporated into staff's proposed condition of certification **VIS-10**.

To mitigate for blocking the view of Mt. Diablo from the Interpretive Center, Calpine would install benches, an information kiosk, information panels, and free-of-charge viewscopes at two nearby locations on the Shoreline trail where views toward Mt. Diablo would not be affected by the project. Please see the Scenic Vistas section of this analysis for additional details of this proposal. The proposed trailside amenities, incorporated by staff into proposed condition of certification **VIS-9**, would enhance views of Mt. Diablo from the area of KOP 2, compensating for the view that would be lost from the deck of the Interpretive Center.

Staff believes that proper implementation of conditions of certification **VIS-2, VIS-3, VIS-9,** and **VIS-10** would reduce the visual impacts that would be experienced at KOP 2 to a level that would be adverse but not significant.

KOP 3: Hayward Shoreline Regional Park at Cogswell Marsh Footbridge

Contrast with Landforms/Water

VISUAL RESOURCES Figure 6B shows a simulation of the project, as it would be seen from KOP 3. The horizontal form of the cooling tower, which would partially be obscured by a warehouse building, would cause low contrast with the rolling, horizontal form of the East Bay Hills. The screening structure would obscure the form of the HRSG units and break up the verticality of the exhaust stacks, reducing the high level of contrast with the form of the East Bay Hills that these project elements would have presented without screening. Viewed from the perspective of KOP 3, the arched form and curved lines of the screening structure would contrast moderately with the rolling form and undulating line of the East Bay Hills. The gray and dark blue colors of the project structures would cause moderately low contrast with the seasonal green and brown colors of the hillsides and marshlands and the blue of the water. Scale contrast would be low since the project would appear much smaller than the landforms and water. In summary, the project would cause moderate form, line, and color contrast, and low scale contrast in comparison to landforms and water.

Contrast with Existing Structures

In the view from KOP 3, the horizontal form and straight lines of the cooling tower would appear similar to the form and line of existing structures. The arched form and curved lines of the screening structure (which substantially obscures the form and line of the HRSG units and exhaust stacks) would not appear consistent with existing structures. The gray and blues colors of the project would contrast moderately with the white color of existing structures (which themselves contrast highly with landforms). The project would appear much larger than existing structures so scale contrast would be high. In summary, the project would cause high form, line, and scale contrast, and moderate color contrast in comparison to existing structures.

Project Dominance

Although the project would appear considerable in size, it would occupy a small portion of the wide field of view available at KOP 3. The spatial prominence of the project would be reduced somewhat since it would be seen entirely against the backdrop of the East Bay Hills (i.e., project structures would not extend above the ridgeline of the hills). Overall project dominance would be co-dominant.

View Blockage

The project would block from view a relatively small amount of an undeveloped portion of the East Bay Hills. In addition, this noticeable view blockage would be of short duration as a trail user's position relative to the project site changes. The severity of view blockage would be moderate.

Overall Visual Change and Visual Impact Significance

The color, form, and line of the screening structure would relate fairly well with the East Bay Hills (higher quality elements in the view). On the other hand, the unique project design would contrast highly with the form and line of the existing structures (lower quality elements) in the view from KOP 3. The overall degree of visual change that

would be experienced at KOP 3 would be moderate. Combined with the moderate to high overall visual sensitivity of the setting, the resulting visual impact would be considered significant.

Mitigation Measures

Given that the existing structures in the view from KOP 3 detract from the visual quality of the setting, it would not be beneficial to reduce the project's visual contrast with these lower quality elements at the expense of increasing its level of contrast with the East Bay Hills. Perimeter landscaping (**VIS-2**) would soften and screen views of the project's lower structures. **VIS-3** would ensure that project structures are painted and treated so they do not unduly contrast with their surroundings. The trees Calpine would plant along the edge of the Industrial Corridor would screen views from the Shoreline trail of several of the existing industrial buildings near the project site. The benefit of screening these structures, which contrast highly with their setting due to their light, reflective colors, would compensate for the project's level of contrast. Proper implementation of condition of certification **VIS-10**, in combination with **VIS-2** and **VIS-3**, would reduce the visual impacts to KOP 3 to a level that would be adverse but not significant.

KOP 4: State Route 92 at Hayward-San Mateo Bridge Toll Plaza

Contrast with Landforms

In the view from KOP 4, the horizontal form of the cooling tower and AWT facilities would not be substantially noticeable (provided that the water tanks are painted in a color that blends with the setting). The screening structure would substantially obscure the form and line of the HRSG units and break up the verticality of the exhaust stacks. The screening structure itself would contrast moderately with the rolling, horizontal form of the East Bay Hills. The gray and blue colors of the project would cause moderately low contrast with the seasonal brown and green color of the landforms, and the dark gray of the roadway. Scale contrast would be low since the project would appear much smaller than the landforms. In summary, the power plant would cause moderate form and line contrast, moderately low color contrast, and low scale contrast with landforms.

Contrast with Existing Structures

The curved form and lines of the project would contrast highly with the predominantly horizontal, boxy forms and straight lines of existing structures. The gray and blue colors of the project would cause moderately low contrast with the grayish color of existing structures. Scale contrast would be high since the project would appear much larger than existing structures.

Project Dominance

Although the project would be of considerable size, it would occupy a relatively small part of the wide field of view available at KOP 4. The project would be spatially prominent due to its exposed position in the landscape within SR 92 motorists' normal cone of vision. Spatial prominence would be reduced somewhat since the project would be seen entirely against the backdrop of the East Bay Hills. Overall project dominance would be co-dominant.

View Blockage

The project would block only a small portion of the surrounding hillsides. In addition, this noticeable view blockage would be of short duration as a motorist's position relative to the project site changes. The severity of view blockage would be considered moderately low.

Overall Visual Change and Visual Impact Significance

The color, form, and line of the screening structure would relate fairly well with the East Bay Hills (higher quality elements in the view). On the other hand, the unique project design would contrast highly with the form and line of the existing structures (lower quality elements) in the view from KOP 4. The overall degree of visual change that would be experienced at KOP 4 would be moderate. Combined with the moderate overall visual sensitivity of the setting, the resulting visual impact would be considered adverse but less than significant.

Mitigation Measures

None required for this KOP. Staff's proposed conditions of certification **VIS-2** (perimeter landscaping), **VIS-3** (color and finishes), and **VIS-10** (offsite landscaping) would further reduce the adverse visual impacts of the project.

KOP 5: Industrial Corridor (Cabot Boulevard at Depot Road)

Contrast

The predominant existing structure in the view from KOP 5 is a fence along Depot Road. The pitched roof of a warehouse structure and several utility poles are also visible. The project would contrast moderately with existing structures in regard to form, line, and color (see **VISUAL RESOURCES Figure 8B**). Although taller than the fence, as a whole the project would appear much smaller than the fence. The project would also appear much smaller than the trees visible in the photograph. Thus, scale contrast would be low.

Project Dominance

The project would be of considerable size but would occupy only a minor part of the setting. The project would be spatially prominent because it would be skylined. Overall project dominance would be an intermediate level of subordinate to co-dominant.

View Blockage

The project would block only a small part of the sky, so the severity of view blockage would be low.

Overall Visual Change and Visual Impact Significance

The level of visual change that would be experienced at KOP 5 would be low to moderate. Considering the low to moderate overall visual sensitivity of the setting, the resulting impact would be adverse but less than significant.

KOP 6: Residential Area East of Industrial Boulevard

Only the upper approximately 35 feet of the 228-foot tall radio towers is visible from ground level views in the area of KOP 6 (see **VISUAL RESOURCES Figure 9A**). The tallest components of the project are the two 145-foot tall HRSG exhaust stacks. Thus, the project would not be visible from ground level views in the area of KOP 6, so no visual simulation is presented. The tops of the HRSG stacks and the power plant screening structure may be visible from the second story windows of the residences along Laguna Drive and Continental Avenue. However, visual contrast and view blockage would be low, and project dominance would be subordinate. Thus, the level of visual change experienced at this KOP would be low. Considering the moderate overall sensitivity of the setting, the resulting visual impact would be adverse but less than significant.

Project Operation – Linear Facilities

Because there would be no apparent evidence of the underground water and gas supply pipelines (except for an occasional aboveground warning marker for the gas pipelines), no significant visual impacts would occur during pipeline operation. **VISUAL RESOURCES Figure 10B** (**Visual Resources Appendix VR-4**) presents a visual simulation of the proposed transmission line as viewed from SR 92.

KOP 7: Transmission Line Crossing of SR 92

Contrast

The narrow, vertical form of the proposed transmission tower would cause a moderate to high degree of contrast with the triangular, vertical form of the existing lattice tower. The straight lines of the proposed tower would be similar to the straight lines of the existing lattice tower. The gray color of the proposed transmission line would cause low contrast with the white to light gray color of the lattice tower, and moderate contrast with the light blue color of the sky. The proposed tower would appear taller and denser than the lattice tower so scale contrast would be moderate. In summary, the proposed transmission tower would cause moderate to high form contrast, moderate color and scale contrast, and low line contrast.

Project Dominance

The proposed transmission tower would be considerable in size but would occupy only a minor part of the setting. The tower would be spatially prominent since it would be located within SR 92 motorists' normal cone of vision and would be skylined. Overall project dominance would be co-dominant.

View Blockage

The transmission tower would block only a small part of the sky, so the severity of view blockage would be low.

Overall Visual Change and Visual Impact Significance

The level of visual change that would be experienced at KOP 7 would be moderate. Considering the moderate overall visual sensitivity of the setting, the resulting impact would be adverse but less than significant.

Cooling Tower and HRSG Exhaust Visible Plumes

Staff analyzed the RCEC project's proposed cooling tower and heat recovery steam generators (HRSGs) exhaust stack visible plumes. The Applicant has proposed the following visible plume abatement (Calpine/Bechtel 2001b):

- Plume abated wet/dry cooling tower with a plume abatement design point of 38°F and 80 percent relative humidity (i.e., preventing the formation of visible plumes when the ambient temperature is above 38°F and the relative humidity is less than 80 percent).
- An economizer bypass that can increase the stack exhaust temperature by as much as 100°F to reduce plume frequency from the HRSG stacks.

Cooling Tower Visible Plumes

Staff modeled a conventional cooling tower and the proposed plume-abated wet/dry cooling tower and the visible plume frequency results are presented in **VISUAL RESOURCES Table 1**.

VISUAL RESOURCES: Table 1
Staff Predicted Hours with Cooling Tower Visible Plumes
San Francisco Airport 1990 to 1995 Meteorological Data

		Unabated Cooling Tower		Abated Cooling Tower	
	Available (hr)	Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,582	29,945	57%	275	0.52%
Daylight, No Fog/No Rain	24,694	6,296	25%	21	0.09%
Seasonal Daylight, No Fog/No Rain	10,354	4,132	40%	21	0.20%
Seasonal Night, No Fog/No Rain	11,903	10,538	89%	187	1.57%

Seasonal conditions occur anytime from November through April.

As can be seen in Table 1, the plume-abated wet/dry cooling tower has the potential to reduce the cooling tower visible plumes to a very low frequency, particularly daytime plumes.

The 10th percentile frequency plume dimension modeling results for a conventional cooling tower and the proposed plume abated wet/dry cooling tower are presented in **VISUAL RESOURCES Table 2**.

VISUAL RESOURCES: Table 2
10th Percentile Cooling Tower Visible Plume Dimensions

Seasonal Daylight No Fog/Rain Hours	Unabated Cooling Tower	Abated Cooling Tower
Length (ft)	1,060	No Plume
Height (ft)	810	No Plume
Width (ft)	140	No Plume
Seasonal Night, No Fog/No Rain		
Length (ft)	4,412	No Plume
Height (ft)	723	No Plume
Width (ft)	232	No Plume

Seasonal = November through April

As Table 2 shows, the proposed plume abated wet/dry cooling tower plumes are not predicted to occur more than 10 percent of the seasonal daylight no fog/no rain hours. Additional cooling tower plume modeling frequency and dimension results are provided in the staff's modeling analysis (Walters 2001).

HRSG Visible Plumes

Staff modeled both abated and unabated conditions from the HRSGs using exhaust data provided by the Applicant. The visible plume frequency modeling results are presented in **VISUAL RESOURCES Table 3**.

Visual Resources: Table 3
Staff Predicted Hours with HRSG Visible Plumes
San Francisco Airport 1990 to 1995 Meteorological Data

		Unabated HRSG Worst Case[1]		Abated HRSG Worst Case[1]	
	Available (hr)	Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,582	40,513	77%	4,614	8.8%
Daylight, No Fog/No Rain	24,694	13,500	55%	383	1.6%
Seasonal Daylight, No Fog/No Rain	10,354	7,887	76%	365	3.5%
Seasonal Night, No Fog/No Rain	11,903	11,633	98%	2,641	22.2%
		Unabated HRSG – Power Augmentation		Abated HRSG – Power Augmentation	
	Available (hr)	Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,582	37,516	71%	3,017	5.7%
Daylight, No Fog/No Rain	24,694	11,062	45%	229	0.93%
Seasonal Daylight, No Fog/No Rain	10,354	6,887	67%	223	2.2%
Seasonal Night, No Fog/No Rain	11,903	11,481	97%	1,760	14.8%
		Unabated HRSG – No Duct Firing or Power Augmentation		Abated HRSG – No Duct Firing or Power Augmentation	
	Available (hr)	Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,582	5,366	10.2%	1	0.002%
Daylight, No Fog/No Rain	24,694	456	1.8%	0	0%
Seasonal Daylight, No Fog/No Rain	10,354	423	4.1	0	0%
Seasonal Night, No Fog/No Rain	11,903	2,985	25.1%	0	0%

[1] – Worst case operation occurs during maximum duct firing and power augmentation which both increase the exhaust moisture concentration.
Seasonal conditions occur from November through April.

As can be seen in Table 3, the economizer bypass plume abatement method proposed for the HRSGs has the potential to reduce the visible plumes to a very low frequency, particularly daytime plumes. The normal operating condition during nighttime and during cold weather is expected to be base load operation without power augmentation or full load duct firing, so the actual HRSG mitigated plume frequency is expected to be as low as 2 percent for all hours.

The 10th-percentile frequency plume dimension modeling results for abated and unabated HRSG plumes are presented in **VISUAL RESOURCES Table 4**.

VISUAL RESOURCES: Table 4
10th Percentile HRSG Visible Plume Dimensions

Seasonal Daylight No Fog/Rain Hours	Unabated HRSG Worst Case[1]	Abated HRSG Worst Case[1]
Length (ft)	735	No Plume
Height (ft)	610	No Plume
Width (ft)	112	No Plume
Seasonal Night, No Fog/No Rain		
Length (ft)	3,067	1,643
Height (ft)	661	542
Width (ft)	170	107
Seasonal Daylight No Fog/Rain Hours	**Unabated HRSG – Power Augmentation**	**Abated HRSG – Power Augmentation**
Length (ft)	730	No Plume
Height (ft)	620	No Plume
Width (ft)	112	No Plume
Seasonal Night, No Fog/No Rain		
Length (ft)	2,804	1,286
Height (ft)	657	513
Width (ft)	158	93
Seasonal Daylight No Fog/Rain Hours	**Unabated HRSG – No Duct Firing or Power Augmentation**	**Abated HRSG – No Duct Firing or Power Augmentation**
Length (ft)	No Plume	No Plume
Height (ft)	No Plume	No Plume
Width (ft)	No Plume	No Plume
Seasonal Night, No Fog/No Rain		
Length (ft)	1214	No Plume
Height (ft)	469	No Plume
Width (ft)	79	No Plume

1 – Worst case operation occurs during maximum duct firing and power augmentation which both increase the exhaust moisture concentration.
Seasonal = November through April

As Table 4 shows, the proposed plume-abated HRSG exhaust plumes are not predicted to occur more than 10 percent of the seasonal daylight no fog/no rain hours under any operating condition. Additional HRSG plume modeling frequency and dimension results are provided in staff's modeling analysis (Walters 2001).

Visible plumes from the RCEC's proposed plume abated wet/dry cooling tower and HRSG will occur infrequently during periods of extreme cold and wet weather. The actual frequency of occurrence is weather dependent and will vary from year to year. Additionally, visible plume formation can occur during the daytime or nighttime; however, the meteorological data reviewed indicates that conditions for visible plume

formation and maximum plume dimensions are more prevalent during nighttime and early morning hours.

Unabated cooling tower and HRSG plumes would cause significant visual impacts. Unabated nighttime plumes would be of concern because they would occur very frequently and would be quite large. Due to bright lights at the WPCF and the truck terminal east of the site, and the glow from the developed areas to the north and east of the site, nighttime plumes would cause a potentially significant impact to eastbound motorists on SR 92 and to residents to the east. However, the project's major visible plume sources are proposed to be mitigated by the Applicant and the visible plumes from the mitigated cooling tower and HRSG exhausts are not expected to cause a significant visual impact since their predicted occurrence is expected to be very low. However, to ensure that the plume abatement equipment is operated as proposed by the Applicant, staff recommends condition of certification **VIS-8**.

D.Light or Glare

The RCEC would require night lighting for operational safety and security. To reduce the potential for offsite impacts, Calpine/Bechtel has proposed the following mitigation measures:

- Lighting would be restricted to areas required for safety, security, and operation;
- High illumination areas not occupied on a regular basis would be provided with switches or motion detectors to light these areas only when occupied; and
- To reduce offsite visibility and potential glare, non-glare fixtures would be specified, lights would be directed to illuminate only those areas where the light is needed, and lights would be hooded and shielded.

Staff has incorporated these measures in a proposed condition of certification (**VIS-4**). Given the unobstructed views of the site from SR 92 across the open baylands (which are very dark at night), unshielded nighttime construction lighting would be of concern. With proper implementation of conditions **VIS-4** and **VIS-11**, visible nighttime lighting and glare impacts would be kept to less than significant levels during both construction and operation of the power plant.

To reduce potential glare from project structures that could affect daytime views, the Applicant has proposed the following mitigation measures:

- The stainless steel mesh on the architectural screening structure would have a brushed finish to reduce reflectivity;
- The switchyard equipment would have a neutral gray finish;
- The transmission towers would be treated with a galvanized neutral gray finish;
- Non-specular conductors would be used;
- Insulators would be non-reflective and non-refractive; and
- Project signs would use non-glare materials.

Staff has incorporated these measures in proposed conditions of certification (**VIS-3** and **VIS-6**). With proper implementation of these conditions of certification, glare impacts that could affect daytime views would be kept to less than significant levels.

CUMULATIVE IMPACTS

No reasonably foreseeable planned projects that would contribute to cumulative visual impacts were identified. Potential project contributions to cumulative visible plume impacts, when combined with the existing plume at the Rohm and Haas facility, are sufficiently infrequent (as mitigated) that staff considered these to be *de minimis* and less than significant.

ENVIRONMENTAL JUSTICE

Staff reviewed the demographic information provided in the **SOCIOECONOMICS** section of this SA in relation to the locations around the proposed project that have the potential to receive a significant visual resources impact (KOPs 1-3). Because there is no minority or low-income population within those areas that have the potential to receive a significant visual impact, the project would not cause an unmitigated disproportionate visual impact on a minority or low-income population.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LOCAL

VISUAL RESOURCES Table 5 provides a listing of the applicable City of Hayward LORS. Fifteen relevant policies and standards were found to pertain to the enhancement and/or maintenance of visual quality. **Table 5** includes a determination of the project's consistency with these policies and standards. The project would be inconsistent with one General Plan policy. Furthermore, the project would not comply with several zoning standards related to visual resources, and in some instances, the AFC and supplemental information was insufficient to make a consistency determination. With proper implementation of staff's proposed conditions of certification, the project would be expected to comply with the General Plan policy and zoning requirements.

VISUAL RESOURCES: Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation / Conditions	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
City of Hayward General Plan • City Image	The land use policies and design regulations of the City will be used to shape development in ways consistent with the desired city character. • Establish site plan review standards which seek to preserve vistas, significant natural features, drainage and solar access, and which provide for continuity of bike and pedestrian ways or trails (Strategy #6).	NO	The background discussion in the City Image Chapter of the General Plan states that views of the hills from the shoreline and bay plain are central to Hayward's physical image. The project would not preserve a scenic vista since it would nearly block the entire view of Mt. Diablo currently available from the Hayward Shoreline Interpretive Center, which was designed to provide vista views across the open baylands. Implementation of condition of certification **VIS-9** would result in the installation of new interpretive facilities within the shoreline area to compensate for the view that would be lost from the Interpretive Center. **Implementation of VIS-9 would enhance shoreline visitors' appreciation and understanding of Mt. Diablo and would bring the project into conformance with this General Plan strategy.**
City of Hayward General Plan • Urban Design	• Enhance entrances to Hayward with distinctive planting, signing or architecture (Strategy #2).	YES	The City of Hayward believes that architectural treatment is both desirable and appropriate for the RCEC considering that it would be highly visible from the Hayward-San Mateo Bridge, which the General Plan recognizes as an important gateway into the City. The Urban Design Chapter of the General Plan states that City entrances should be signified by suitable landmarks or entry features and suggests that windmills on the baylands near the San Mateo bridge would provide a memorable entrance to the City. The General Plan expresses concern about the visual appearance of structures at the bridge entrance to the City and states that visible structures should contribute to the character of the baylands. The "Wave" structure would relate to the baylands in the sense that the bay tides transport vital nutrients used by shoreline plants and animals. The City "insists" that the architectural treatment for the project be unique and distinctive and believes that the proposed "Wave" fulfills this objective (Armas 2001).
City of Hayward Zoning Ordinance • Section 10-	Minimum Front Yard (Standard Street): 10 feet Minimum Side Yard: None Minimum Side Street Yard: 10 feet Minimum Rear Yard: None	YES	As depicted on the site plan, the project proposes 20-foot wide property line setbacks along Whitesell Street and Enterprise Avenue (Calpine/Bechtel 2001a). The project would comply with

VISUAL RESOURCES: Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation / Conditions	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
1.1630 Yard Require-ments			the yard requirements.
• Section 10-1.1635 Height Limit	Maximum building height: • Industrial building: No Limit • Office building: 40 feet Maximum Height for Fences/hedges/walls: • Front and Side Street Yard: 4 feet • Side and Rear Yard: No Limit	NO	The project would comply with the building height provisions since there are no limitations for industrial buildings and the office-like buildings, such as the warehouse/maintenance office and administration building/control building, would be 25 feet tall. As depicted on the conceptual landscaping plan (Calpine/Bechtel 2001b), a 6-foot tall solid-wood fence would be located within the street yard along Whitesell Street, inconsistent with the 4-foot maximum height for fences. **Condition of certification VIS-5 would ensure compliance with this standard.**
• Section 10-1.1640 Site Plan Review	Site Plan Review approval is required before issuance of any building, grading, or construction permit within this district only if the Planning Director determines that a project is incompatible with City policies, standards and guidelines. Site Plan Review approval may also be required for fences (i.e., such as anodized gray chain link fences along corridor streets) in certain circumstances.	UNKNOWN	**Staff's proposed conditions of certification for landscaping (VIS-2), structural treatment (VIS-3), fences and walls (VIS-5), signs (VIS-6), and architectural treatment (VIS-7) allow for review and comment by the City of Hayward.**
• Section 10-1.1645 Minimum Design and Performance Standards (Industrial Buildings and Uses)	This section establishes design and performance standards that shall apply to the construction of industrial and commercial buildings and uses in the (I) Industrial District. The applicable standards pertinent to visual resources are summarized below.		
	a. Accessory Buildings, Detached. Shall not exceed one story (1).	YES	The warehouse/maintenance shop, administration building/control room, and water treatment building/laboratory would not exceed one story.

VISUAL RESOURCES: Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation / Conditions	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	f. Architectural Design Principles. • Incorporate design elements that are harmonious and in proportion to one another (1). • Incorporate an attractive mixture of color and materials. Select building materials and colors that are harmonious with the site and surrounding uses, buildings and area. Base colors shall be low reflective, subtle, neutral. Building trim may feature brighter accent colors (2). • Create shadow relief with recesses, columns, score lines, trellises, windows, or other features on blank wall when they are visible from adjacent streets (4). • Building facades in excess of 100 feet long and/or greater than 20 feet in height shall be setback a minimum of 20 feet from the front property line and must incorporate recesses and projects, which may include windows and trellises (5). • New buildings shall use roof parapet walls to screen rooftop mechanical equipment (6). • Any metal clad building which is visible from a street shall adhere to these design criteria. Unpainted (gray galvanized) metal surfaces shall not be used on primary structures (7). • Truck loading areas shall not face the street, unless no practical alternative exists (8). • Industrial facilities, whose building design is utilitarian by necessity, shall be screened with landscaping (9).	YES/ UNKNOWN	• The architectural treatments proposed for the power plant and cooling tower are harmonious with one another. (1) • Condition of certification **VIS-3** would ensure that building materials and colors would be harmonious with the site and surrounding area. (2) • The one-story buildings containing the facility's administrative offices, warehouse, and water treatment laboratory and fronting on Whitesell Street would be set back about 60 feet from the property line. The Applicant has committed to providing architectural treatment to these buildings consistent with the design guidelines. **Conformance with these principles would be ensured by condition VIS-7.** (4) (5) (6) (7). • Truck loading areas would not face the street. (8) • The proposed landscaping would partially screen the power plant structures. (9)
	i. Fences, Hedges, Walls. • Fences, hedges and walls shall not exceed a height of 4 feet in a required front yard, or side street yard (1). • For fences limited to a maximum of 4 feet in height, the height limit shall not be exceeded at grade measured	NO	As depicted on the conceptual landscaping plan, a 6-foot tall solid-wood fence would be located within the street yard along Whitesell Street, inconsistent with this standard. The City has indicated that decorative masonry walls should be located along Enterprise Avenue and Whitesell Street (Ameri 2001). **Condition of certification VIS-5 would ensure**

VISUAL RESOURCES: Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation / Conditions	Basis for Consistency
Source	Policy and Strategy Descriptions		
	on either side of the fence (3).		**compliance with this standard.**
	l. Landscaping. • Landscape Areas. Required front, side, side street, and rear yard areas shall be landscaped except for permitted driveways, and walkways. All other areas not utilized for structures or paving shall be landscaped unless otherwise authorized by the Planning Director or other approving authority because of site constraints, existing or adjacent site conditions, or phased development (a). Required landscape areas shall be planted with water-conserving trees, shrubs, turf grass, ground cover, or a combination thereof (c). • Buffer Trees/Landscaping. Masonry walls, solid building walls, trash enclosures, and/or fences facing a street or driveway shall be buffered with continuous shrubs or vines (b). • Parking Lot Trees/Planters. Parking areas shall include a minimum of one 15-gallon parking lot tree for every 6 parking stalls, unless an alternative tree planting is approved by the City Landscape Architect (a). Parking and loading areas shall be buffered from the street with shrubs, walls, or earth berms. Where shrubs are used for buffering, the type and spacing of shrubs shall create a continuous 30-inch-high screen within 2 years (e). • Street Trees. Street trees shall be planted along all street frontages at a minimum of one 24-inch box tree per 20 to 40 lineal feet of frontage or fraction thereof, except where space is restricted due to existing structures or site conditions. • Irrigation. Within all required	YES/ UNKNOWN	• Landscape Areas. Landscaping, consisting of a mixture of fast-growing evergreen trees, shrubs, and groundcovers, is proposed within the required front and side street yards. • Buffer Trees/Landscaping . Rows of shrub-type trees are proposed in front of the fences along Whitesell Street and Enterprise Avenue. The City believes that the shrub massing, variety and spacing is inadequate as shown on the conceptual landscape plan, and suggests using large shrubs (Ameri 2001). • Parking Lot Trees/Planters. No trees are proposed within the parking lot. City has indicated that one parking lot tree for every 6 parking stalls is needed (Ameri 2001). Consistent with the standards, the parking area along Whitesell Street would be buffered from the street by a continuous screen of White Oleander that would range in height from 2-4 feet at planting. • Street Trees. Consistent with the standards, the proposed street trees along Enterprise Avenue and Whitesell Street shown on the conceptual landscape plan are 24" box, and would be planted 30 feet on center. • Irrigation. The conceptual landscape plan indicates that a water efficient irrigation system would be installed. • Maintenance. Procedures for maintenance of the landscaping are not specified on the conceptual landscape plan or in the AFC. **Condition of certification VIS-2 would ensure compliance with the City's landscaping requirements, and that landscaping is installed and maintained in a manner acceptable to the City.**

VISUAL RESOURCES: Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation / Conditions	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	landscaped areas, an automatic water efficient irrigation system shall be installed upon initial construction of any building or substantial alteration to any building or site. • Maintenance. After initial installation, all plantings shall be maintained in a reasonably weed-free and litter-free condition, including replacement where necessary (a). Required street, parking lot, and buffer trees shall not be severely pruned, topped, or pollarded (cut back to the trunk) (b).		
	m. Lighting, Exterior. Exterior lighting and parking lot lighting shall be provided in accordance with the Security Standards Ordinance and be designed by a qualified lighting designer and erected and maintained so that light is confined to the property and will not cast direct light or glare upon adjacent properties or public rights-of-way.	YES/ UNKNOWN	The Applicant has proposed measures to control light trespass outside the boundaries of the project. The information provided in the AFC does not allow a determination that the lighting conforms to the Security Standards Ordinance. **Condition of certification VIS-4 would ensure compliance with this standard.**
	n. Outdoor Storage. All uses shall be conducted wholly within enclosed buildings. Minor open storage is a secondary use and is permitted, provided the materials, products, or equipment stored are necessary to the operation of the use being conducted on the site. Storage shall not be placed within required yard or parking areas, and the storage shall be compatible with adjoining uses (for example, adequately screened, set back or not too high, and not visually unpleasant).	YES	Storage would occur within enclosed buildings and tanks. No storage is proposed within required yards or parking areas.
	g. Roof-Mounted Equipment. Roof-mounted equipment, antennas, satellite dishes, support structures and similar devices shall be screened from public view, preferably by the roof form.	YES/ UNKNOWN	The elevation drawings provided in the AFC do not depict equipment mounted on the roofs of the proposed buildings. **Conformance with this requirement would be ensured by condition of certification VIS-7.**
	r. Signs. Signs shall be of a design in harmony with the environment and shall not constitute excessive visual impact.	YES/ UNKNOWN	No signs are depicted on the site plan or conceptual landscaping plan. **Condition of certification VIS-6 would ensure compliance with this provision.**

VISUAL RESOURCES: Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation / Conditions	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	t. Trash and Recycling Facilities. Trash and recycling facilities shall be adequately screened from view, utilizing a decorative wood or masonry wall or combination thereof.	YES	No trash facilities are depicted on the site plan. However, the extensive landscaping proposed along the perimeter of the site would sufficiently screen any proposed trash facilities.
	u. Truck Loading Facilities. Loading areas should not dominate the street frontage, and should not directly face a major street unless no practical alternative exists.	YES	The ammonia truck unloading area would be located a sufficient distance from Enterprise Avenue and Whitesell Street so as not to dominate the street frontage.

RESPONSES TO AGENCY AND PUBLIC COMMENTS

AGENCY COMMENTS

East Bay Regional Park District

EBRPD (8-8)-8: *The District is concerned with potential significant impacts on parklands from the proposed project. In particular, the potential impacts include, but are not limited to, visual resources (parkland visitors)...*

Given the moderately high sensitivity of visitors to the Hayward Shoreline Regional Park, the moderate degree of visual change caused by the project would result in a significant adverse impact. For a detailed analysis of potential visual impacts to the Shoreline Park, see the discussion for Key Observation Point 3 (Hayward Shoreline Park at the Cogswell Marsh Footbridge) in the Impacts section of this analysis. Staff believes that the Applicant's proposal to plant trees at the edge of the Industrial Corridor to screen the highly contrasting existing structures, in concert with other staff proposed conditions of certification, would reduce the project's visual impact to parkland visitors to a less than significant level.

EBRPD (8-20)-8: *The most critical environmental concerns for the District are...significant impacts on scenic vistas in [the] Hayward Regional Shoreline park...The project information does not adequately analyze the impact on scenic vistas within the Hayward Regional Shoreline park.* ***EBRPD (8-27) – 1:*** *...two suggested additional Key Observation Points (KOPs). These 2 KOPs would be located in the freshwater marsh portion of the Hayward Regional Shoreline which the East Bay Regional Park District operates. This area is used for scientific investigation and study purposes by undergrads, grads, and international delegations (such as from UC Berkeley, Stanford University, Italy, and Japan). The proposed project would potentially obliterate the view of Mt. Diablo and replace it with a massive Wave and cooling towers.*

The project would generate a substantial change in the visual character and quality of the environment. It would have a significant impact on the appreciation and enjoyment of the outdoor classroom.

In a data request, staff requested that the Applicant establish a KOP in the freshwater portion of the Hayward Regional Shoreline. This area of the Shoreline marsh is utilized approximately seven times per year by a wide range of scholars studying the creation and restoration of the wetlands (Tong 2001b). The Applicant objected to this request on the grounds that the number of viewers is low, there is no residential or recreational use at this viewpoint, and no unique scenic values were identified which are not represented by the other seven KOPs. The overall sensitivity of the setting viewed from this area would be moderate as a result of the moderate visual quality, moderate viewer concern, and moderate overall viewer exposure. The view toward Mt. Diablo would not appear to be completely blocked from this area. One of the areas visited by the scientists is near Breakwater Avenue and east of the area selected for the benches and kiosk. The kiosk location is just east of where views toward Mt. Diablo would begin to be affected by the power plant. The overall visual change that would be experienced at this location would be moderate to high (due to the high contrast and project dominance). Considering that the area is not publicly accessible and that the viewers would primarily be focused on studying the marshlands, the visual impact is considered adverse but not significant. The proposed trees along the edge of the Industrial Corridor would reduce the visibility of the existing buildings in the area and improve the overall quality of the view in the direction of the site. To reduce the visibility of construction activities at the project site to visitors to this portion of the Shoreline, staff has proposed condition of certification **VIS-1**.

City of Hayward

CITY (7-27)-7: *The project site is highly visible to vehicles travelling east on the San Mateo-Hayward Bridge. The project will constitute a significant change to the view of this important entryway to the City of Hayward. The size and appearance of the facilities and the emissions from the project will have a significant impact on the image of the City held by the 50,000 daily bridge users today and perhaps 100,000 users in the future. It is essential that the project not serve to degrade these views and images.*

Staff analyzed the project's potential to cause visual impacts on eastbound motorists on SR 92 (see the discussion for KOP 4). The proposed project would cause a moderate degree of overall change when viewed from SR 92. Considering the moderate overall sensitivity of the setting viewed from this location, the resulting visual impact would be adverse but not significant.

CITY (7-27)-7*: The water vapor plumes would also be a dominant element in views of the project site for long distances and may constitute a significant visual impact. Appropriate mitigation should be implemented as much as possible with available technology.*

The Applicant has proposed mitigation for project's major visible plume sources. Staff's modeling analysis shows that the predicted occurrence of visible plumes from the mitigated cooling tower and HRSG exhaust stacks are not expected to cause a significant visual impact since the frequency of occurrence would be very low. To

ensure that the plume abatement equipment is operated as proposed by the Applicant, staff has recommended condition of certification **VIS-8**.

CITY (7-27)-7: *It is important to address the visual impacts of the project from near views as well as from a distance. Consequently, sensitive consideration should be given to views of the project from Enterprise, Whitesell Avenue, the Shoreline, and the proposed Route 92 pedestrian/bicycle over-crossing that is part of the San Francisco Bay Trail.*

The Applicant has proposed extensive landscaping along the project's frontage with Enterprise Avenue and Whitesell Street. **VISUAL RESOURCES Figures 5B** and **6B** are simulations of the project as it would be seen from the Hayward Shoreline Interpretive Center and from the Cogswell Marsh footbridge in the Hayward Regional Shoreline Park. Staff's analysis demonstrates that the project as proposed would cause significant adverse visual impacts to visitors to the Interpretive Center and Shoreline Park. Staff believes that the Applicant's proposal to install new trailside amenities would sufficiently mitigate for blocking the view of Mt. Diablo from the Interpretive Center. In addition, the proposal to plant trees at the edge of the Industrial Corridor to screen the highly contrasting existing structures, in concert with other staff proposed conditions of certification, would reduce the project's visual impacts to Interpretive Center and parkland visitors to less than significant levels.

CITY (7-27)-7: *The architectural treatment of all project facilities and structures should comply with City of Hayward design guidelines for industrial facilities, including the administration and control building and other accessory buildings. Setbacks of structures should be sufficient to allow for appropriate landscaping and screening of the project, including groundcovers, shrubs and trees, as well as appropriate fencing.*

Staff has proposed a condition of certification (**VIS-7**) requiring that architectural treatment of all project structures and buildings comply with the City of Hayward design guidelines for industrial districts. The Applicant has proposed setbacks in conformance with the zoning code, in which the Applicant proposes a mix of trees, shrubs, groundcovers, and decorative fencing. Staff has proposed conditions of certification (**VIS-2**, **VIS-5**, and **VIS-6**) to ensure that landscaping, fences and walls, and signs are designed and installed in conformance with the City's requirements.

CITY (7-27)-7: *Lighting should be designed so as not to interfere with aircraft approaching the Hayward, Oakland, and San Francisco airports. There are also extensive views of this area from Hayward hills residential developments. The impact on the hill area views from the lighting on the project, particularly lighting used to identify the site to aircraft, should be carefully examined.*

The RCEC would require night lighting for operational safety and security. The Applicant has proposed mitigation measures to reduce the potential for offsite impacts, which have been incorporated into staff's recommended condition of certification **VIS-4**. This condition would require project lighting to be designed and installed so that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. Proper implementation of **VIS-4** and **VIS-11** would ensure visible nighttime lighting and glare impacts would be kept to less than

significant levels during both construction and operation. The Federal Aviation Administration (FAA) may require lighting on the project for aviation safety. However, the Applicant believes such a requirement would be unlikely (Calpine/Bechtel 2001b). Staff would expect that if the FAA requires aviation warning lights, these lights would be similar in character (flashing, red) to the warning lights on the four, 228-foot tall KFAX radio towers currently occupying the site. Staff would not expect these lights, if necessary, to cause significant adverse visual impacts.

CITY (7-27)-7: *As detailed plans for the project are not available, the City cannot evaluate the proposal in terms of meeting the City's "Minimum Design and Performance Standards" in the Zoning Ordinance, particularly as they relate to the "Architectural Design Principles" and landscaping.*

Staff has proposed condition of certification **VIS-3** that would require the Applicant to treat project structures and buildings in appropriate colors and non-reflective finishes to minimize visual intrusion and contrast. **VIS-3** would require the Applicant to submit a specific treatment plan to Energy Commission staff and the City of Hayward to ensure that proposed colors and treatment do not unduly contrast with the surrounding landscape, and to ensure that the project's design is consistent with the City's design standards. Staff proposed condition of certification **VIS-7** would require compliance with the City's Architectural Design Principles. Proposed condition of certification **VIS-2** would ensure that landscaping is provided consistent with the City's standards.

public comments

Audrey LePell

I wish to state that the 'visual impacts of the project's architectural design and plume visibility' are notable concerns and should be addressed, I believe, in a stronger manner - with perhaps an invitation to the Hayward considerable Artistic Community to comment on the sculptural or architectural value to our community."

I wish that the other alternative designs would have been made available to the public or that you and/or the City of Hayward would have asked for public comments regarding the actual design of the Center Project. Since the Highway 92/Jackson Street entry way to the City is so important to our community, I would have thought more public discussion would have taken place.

Staff's analysis demonstrates that the proposed project would cause significant adverse impacts due to its high visual contrast with the existing setting. With the mitigation proposed by the Applicant, staff believes that the visual impacts of the project would be reduced to levels that would be adverse but not significant. In regard to visible water vapor plumes, staff's modeling analysis confirms that visible plumes from the mitigated cooling towers and HRSG exhausts would not cause significant adverse visual impacts.

The Applicant presented three design concepts for the project – no architectural treatment (unscreened power plant), office building façade (à la Metcalf Energy Center); and decorative, semitransparent screens (illustrated by the "Wave") at a City-sponsored workshop on April 17, 2001. Energy Commission visual resources staff was not in

attendance. Several members of the Hayward City Council and public present at the workshop endorsed the Wave design (Armas 2001a). Subsequently, the design was made a component of the project presented to the Energy Commission in the Application for Certification filed in May 2001. In data requests, staff requested that the Applicant prepare simulations depicting alternative designs for the facility that would reduce the amount of view blockage of Mt. Diablo. The Applicant responded by stating that they were not aware of any designs capable of preserving views of Mt. Diablo other than constructing the project without any architectural treatment. The City of Hayward staff has made it clear at Energy Commission staff-sponsored workshops that a power plant without architectural treatment would be unacceptable to the City. Specifically, the City supports the proposed Wave design (Armas 2001b).

How will this building look from other views of the City such as the hills, Hesperian Blvd., Clawiter Road, the shoreline trail, the Hayward Golf Course, Hayward Airport, Enterprise Ave. and other streets in the immediate area?

VISUAL RESOURCES Figures 5B and **6B** are simulations of the project as it would be seen from the Hayward Shoreline Interpretive Center and from the Cogswell Marsh footbridge in the Hayward Regional Shoreline Park. The project would not be substantially noticeable from the hills (located about 3.7 miles away) given the intensely urban nature of the foreground and middleground views, or from the streets east of the site, such as Clawiter Road and Enterprise Avenue, due to intervening structures and trees.

Shadow studies should be published as to how this large complex will affect the shoreline property adjacent to the project.

Staff does not anticipate shadows caused by the proposed project to result in significant adverse visual impacts since the public access areas of the Hayward Regional Shoreline are located about 0.73 miles from the project site.

Viola Saima-Barklow

The design of the plant should be changed if views of Mt. Diablo from the Hayward Shoreline Interpretive Center are blocked or degraded. HARD should be consulted.

The proposed project, which is in a direct line of sight with Mt. Diablo from the Hayward Shoreline Interpretive Center, would almost completely block the view of the mountain currently available from the Interpretive Center. **VISUAL RESOURCES Figure 5B** is a visual simulation of the project, as it would appear from the deck leading to the front door of the Interpretive Center. Even without the Wave structure, the project would substantially block the view of Mt. Diablo. In data requests and at workshops, staff tried to persuade the Applicant to reconfigure the project in such a manner that the view of Mt. Diablo would not be obstructed. The Applicant raised issues about the feasibility of reconfiguring the power plant and advanced water treatment facilities and the delays such an endeavor would have on the project's licensing schedule. As an alternative to reconfiguring the project (and thus avoiding the impact), the Applicant proposes to install new trailside amenities to compensate for blocking the view of Mt. Diablo from the deck of the Interpretive Center. Staff believes that the Applicant's proposal would

mitigate the impact to a level that would be adverse but not significant. Please refer to the Scenic Vistas section of this analysis for a detailed discussion of the Applicant's mitigation proposal.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that without the Applicant's proposed mitigation measures and staff's proposed conditions of certification, the proposed project would cause adverse and significant visual impacts. Proper implementation of the Applicant's mitigation measures and staff's proposed conditions of certification would reduce the adverse visual impacts of the project to levels that would not be significant. Staff also concludes that with mitigation the project would be expected to comply with all applicable local LORS related to visual resources.

RECOMMENDATION

If the Energy Commission decides to approve the project, staff recommends that the Commission adopt staff's proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 The project owner shall ensure that visual impacts of project construction are adequately mitigated by implementing the following measures:

Install opaque, solid slats in the chain link fence along the RCEC site's boundary with Whitesell Street. Erect a 12-foot tall fence with opaque, solid slats along the southwest corner of the site, starting at a point in line with the fence along the north boundary of KOP 1, and extending to the warehouse building to the west of the RCEC site.

Staging, material, and equipment storage areas, if visible from public rights-of-way, shall be visually screened with opaque fencing.

All evidence of construction activities, including ground disturbance due to staging and storage areas shall be removed and remediated upon completion of construction. Any vegetation removed in the course of construction will be replaced on a 1-to-1 in-kind basis. Such replacement planting will be monitored for a period of three years to ensure survival. During this period, all dead plant material shall be replaced.

Protocol: The project owner shall submit a plan for screening construction activities at the site and staging, material, and equipment storage areas, and restoring the surface conditions of any rights-of-way disturbed during construction of the transmission line and underground pipelines. The plan shall include grading to the original grade and contouring and revegetation of the rights-of-way.

The project owner shall not implement the plan until receiving written approval of the submittal from the California Energy Commission Compliance Project Manager (CPM).

Verification: At least 60 (sixty) days prior to the start of site mobilization, the project owner shall submit the 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 after installing the screening that the screening is ready for inspection.

The project owner shall notify the CPM within seven days after completing the surface restoration that the areas disturbed during construction are ready for inspection.

VIS-2 Prior to the first turbine roll, the project owner shall prepare and implement an approved perimeter landscape plan to screen the power plant from view to the greatest extent possible. Landscaping shall consist of a mix of trees, shrubs, and groundcovers. Fast growing, evergreen species shall be used to ensure that maximum screening is achieved as quickly as possible and year-round. Trees shall be 24" box size at the time of planting. Suitable irrigation shall be installed to ensure survival of the plantings. Landscaping shall be installed consistent with the City of Hayward zoning ordinance. Plant species shall be selected consistent with the U.S. Fish and Wildlife Services recommendations that plants not provide opportunities for perching by birds of prey.

Protocol: The project owner shall submit a perimeter landscape plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The plan shall include, but not be limited to:

1) A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
2) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and
3) A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM.

Verification Prior to the first turbine roll and at least 60 days prior to installing the landscaping, the project owner shall submit the perimeter landscape plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

VIS-3 Prior to first turbine roll, the project owner shall treat all project structures and buildings visible to the public a) in appropriate colors or hues that minimize visual intrusion and contrast by blending with the landscape, b) such that those structures and buildings have surfaces that do not create glare; and c) such that they are consistent with local laws, ordinances, regulations, and standards. The project owner shall submit for CPM review and approval, a specific treatment plan whose proper implementation will satisfy these requirements.

Protocol: The project owner shall submit the treatment plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The treatment plan shall include:

Specification, and 11" x 17" color simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;

1) A list of each major project structure, building, tank, transmission line tower and/or pole, and fencing specifying the color(s) and finish proposed for each (colors must be identified by vendor brand or a universal designation);

2) Two sets of brochures and/or color chips for each proposed color;

3) Samples of the proposed treatment and color on any fiberglass materials that would be visible to the public;

4) Documentation that the surfaces to be used on all project elements visible to the public will not create glare;

5) Documentation that non-specular conductors, and non-reflective and non-refractive insulators will be used on the transmission facilities;

6) A detailed schedule for completion of the treatment; and

7) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or

structures treated on site until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: At least 60 (sixty) days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed treatment plan to the CPM for review and approval.

If required, the project owner shall provide the CPM with a revised plan within 30 (thirty) days of receiving notification that revisions are needed.

Prior to first turbine roll, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-4 Prior to first turbine roll, the project owner shall design and install all permanent lighting such that a) light bulbs and reflectors are not visible from public viewing areas, b) lighting does not cause reflected glare, and c) illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

1) Lighting is designed so 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;

2) Non-glare light fixtures shall be specified;

3) All lighting shall be of minimum necessary brightness consistent with worker safety;

4) High illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have switches or motion detectors to light the area only when occupied;

5) Parking lot lighting shall be provided in accordance with the City of Hayward Security Standards Ordinance; and

6) A lighting complaint resolution form (following the general format of that in Appendix VR-3) shall be used by plant operations, to record all lighting complaints received and to document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

   The project owner shall notify the CPM when the lighting has been installed. If after inspecting the lighting the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, the project owner shall perform the necessary modifications.

Verification: Prior to the first turbine roll, the project owner shall notify the CPM that the lighting is ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed, within thirty days of receiving that notification the project owner shall implement the modifications.

VIS-5 All fences and walls for the project shall be non-reflective and treated in appropriate colors or hues that minimize visual intrusion and contrast by blending with the surrounding landscape. Fences and walls for the project shall comply with the applicable requirements in the City of Hayward zoning ordinance that relate to visual resources.

Protocol: Prior to ordering fences and walls the project owner shall submit to the City of Hayward for review and comment, and to the CPM for review and approval, design specifications for fences and walls and documentation of their conformance with the City of Hayward zoning ordinance. The submittal to the CPM shall include the City's comments.

The project owner shall not order fences and walls until the submittal is approved by the CPM.

Verification: At least 30 days prior to ordering fences and walls, the project owner shall submit the specifications and documentation 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-6 The project owner shall design project signs using non-reflective materials and unobtrusive colors. The project owner shall ensure that signs comply with the applicable City of Hayward zoning requirements that relate to visual resources. The design of any signs required by safety regulations shall conform to the criteria established by those regulations.

Protocol: The project owner shall submit a signage plan for the project to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: At least 60 days prior to installing signage, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 days after completing installation of the signage that they are ready for inspection.

VIS-7 Prior to the start of commercial operation, the project owner shall treat the major structures of the Advanced Water Treatment (AWT) facility and the buildings housing the project's administrative offices and control room, warehouse, and water treatment laboratory with appropriate architectural treatment if visible from Enterprise Avenue and Whitesell Street. All architectural treatment for the project shall be consistent with the City of Hayward's architectural design guidelines for industrial zoning districts. A specific architectural treatment plan shall be developed for CPM approval to ensure that the treatments do not unduly contrast with the surrounding landscape.

Protocol: The project owner shall submit an architectural treatment plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The architectural screening plan shall include:

1) Specification, and 11" x 17" color simulations at life-size scale as seen from Whitesell Street and Enterprise Avenue, of the treatment proposed for use on the AWT structures and project buildings;
2) A detailed schedule for completion of the treatment; and,
3) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not implement the plan until approved by the CPM.

Verification: At least 60 days prior to start of construction, the project owner shall submit the architectural treatment plan to the CPM for review and approval.

If the CPM notifies the project owner of any revisions that 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 the architectural screening is ready for inspection.

The project owner shall provide a status report regarding screening maintenance in the Annual Compliance Report.

VIS-8 The project owner shall reduce the RCEC cooling tower and HRSG visible vapor plumes by the following methods:

- The project owner shall reduce the RCEC cooling tower visible plumes through the use of a plume abated wet/dry cooling tower that has a stipulated

plume abatement design point of 38°F and 80 percent relative humidity. An automated control system will be used to ensure that plumes are abated to the maximum extent possible for the stipulated design point.

- The project owner shall reduce the RCEC HRSG exhaust visible plumes through the use of an economizer bypass that is capable of raising the exhaust temperature to a minimum of 270°F. An automated control system will be used to ensure that plumes are abated to the maximum extent possible when raising the exhaust temperature to the stipulated design point.

Verification: At least 30 days prior to first turbine roll, the project owner shall provide to the CPM for review and approval the specifications for the automated control systems and related systems and sensors that will be used to ensure maximum plume abatement for the wet/dry cooling tower and HRSG economizer bypass plume abatement systems.

VIS-9 Prior to the first turbine roll, the project owner shall install new trailside amenities to offset the blockage of the view of Mt. Diablo from the observation deck of the Hayward Shoreline Interpretive Center. Consistent with Measure 1 of Calpine's Visual Mitigation Plan, the trail amenities shall include, but not necessarily be limited to, benches, free-of-charge viewscopes, and an information kiosk and set of low panels for the display of interpretive information related to Mt. Diablo and other important elements of the regional setting. The project owner shall work with the Hayward Area Recreation and Parks District (HARD) to develop the final designs for these facilities. As part of this measure, the project owner shall provide the HARD with an adequate budget that would allow its staff to research and prepare the interpretive materials to be mounted on the kiosk and panels. The project owner shall determine the precise location of the trailside amenities in consultation with the CPM and the HARD.

Verification: At least 60 days prior to the start of construction, the project owner shall submit a final design plan for the trailside amenities to the HARD for review and comment and to the CPM for review and approval. If the CPM notifies the project owner that revisions are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit a revised plan to the CPM.

Not less than thirty 30 days prior to the first turbine roll, the project owner shall notify the CPM that the trailside amenities are ready for inspection.

VIS-10 Prior to the start of construction, the project owner shall prepare and implement an approved offsite-landscaping plan. The project owner shall install trees at the Whitesell Business Park (KOP 1) to screen views of the project from this viewing area to the maximum extent possible. Consistent with Measure 1 of Calpine's Visual Mitigation Plan trees shall be planted in the existing empty planting islands at the Whitesell Business Park. If the landowner agrees, the project owner also shall plant trees in the landscape area near the Whitesell Business Park buildings and outdoor patio area to increase the effectiveness of the landscape screening. Consistent with Measure 3 of the Visual Mitigation Plan, the project owner shall install trees along the west side of the warehouse and industrial park

complexes that line the eastern edge of the shoreline wetlands. The extent of the landscaping area, as shown in **Visual Resources Figure 14**, shall be expanded to include the berm from Breakwater Avenue north to Johnson Road. Trees shall be planted close together to create a dense screen. Trees planted along the edge of the Whitesell Business Park parking lot shall be pruned up as they grow to allow westward views from the parking lot to the shoreline open space. Trees planted close to the walls of the warehouses shall be allowed to take on a bush-like form to maximize their screening potential. All tree species shall be fast growing and evergreen and shall be 24" box size when planted. The project owner shall provide an appropriate level of irrigation and fertilization to ensure optimal tree growth, health, and appearance.

Protocol: Prior to start of construction, the project owner shall submit an offsite landscape plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The plan shall include, but not be limited to:

1) A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
2) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and
3) A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM.

Verification: At least 90 days prior to start of construction, the project owner shall submit the perimeter landscape plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

VIS-11 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

1) All lighting shall be of minimum necessary brightness consistent with worker safety.

2) All fixed position lighting shall be shielded, hooded, and directed downward to minimize backscatter to the night sky and direct light trespass (direct lighting extending outside the boundaries of the construction area).

3) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed.

4) A lighting complaint resolution form (following the general format of that in Attachment 1) shall be maintained by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.

Verification: At least 30 (thirty) days prior to the start of ground disturbance, the project owner shall provide to the CPM documentation demonstrating that the lighting will comply with the condition.

If the CPM notifies the project owner that modifications to the lighting are needed, within 30 (thirty) days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.
The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report, accompanied by any lighting complaint resolution forms for that month.

REFERENCES

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Armas. 2001. Letter from Jesus Armas, City Manager, regarding clarification of City's preference for architectural screening of the power plant. Submitted to Kae Lewis December 3, 2001.

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Calpine/Bechtel. 2001b. Russell City Energy Center Data Request Responses (Nos. 84-106). August 2001.

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City of Hayward. 1986 (as amended). General Policies Plan.

City of Hayward. 1999. Zoning Ordinance. September

Haag. 2002. Letter from Nancy Haag, Assistant Vice President, Archon Group (part owners of Whitesell Business Park) to Alex Ameri, City of Hayward, regarding landscaping enhancements at the Whitesell Business Park. Letter dated May 9, 2002.

Hanna. 2002. Letter from Mr. Hanna, Project Manager, Bay Center Distribution Center accepting Calpine's offer to plant trees on their property.

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Smardon, Richard C., James E. Palmer, and John P. Felleman. 1986. *Foundations for Visual Project Analysis.* John Wiley & Sons. New York.

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Tong. 2001b. Letter from Larry Tong, East Bay Regional Park District, to Kae Lewis, providing clarification on the users and frequency of use of the freshwater part of the Hayward Regional Shoreline. September 7, 2001.

U.S. Department of Agriculture, Forest Service. 1995. *Landscape Aesthetics, A Handbook for Scenery Management.* Agriculture Handbook Number 701. USDA, Forest Service.

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Willyerd, Eric. Letter from the Hayward Area Recreation and Parks District Superintendent of Parks regarding the Applicant's mitigation plan for the view blockage of Mt. Diablo from the Hayward Shoreline Interpretive Center. Dated April 11, 2002.

APPENDIX VR – 1: SUMMARY OF ANALYSIS

APPENDIX VR – 2: ANALYSIS METHODOLOGY

Visual resources analysis has an inherent subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

SIGNIFICANCE CRITERIA

Commission staff considered the following criteria in determining whether a visual impact would be significant.

STATE

The CEQA Guidelines defines a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or visual significance (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

LOCAL

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

PROFESSIONAL STANDARDS

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?

- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?

- Will the project eliminate or block views of valuable visual resources?

- Will the project result in significant amounts of backscatter light into the nighttime sky?

- Will the project be in conflict with directly identified public preferences regarding visual resources?

- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

- Will the project result in a substantial and persistent visible exhaust plume?

VIEW AREAS AND KEY OBSERVATION POINTS

The proposed project is visible from a number of areas in the project region. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points[4], or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing conditions photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area.

EVALUATION PROCESS AND TERMINOLOGY

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Staff participated in a pre-filing site visit with the Applicant to identify the KOPs presented in the Application for Certification. After the AFC was filed, staff requested that the Applicant provide revised existing setting photographs and visual simulations presented at life-size scale. The results of staff's analysis are summarized in VISUAL RESOURCES Appendix VR-1. Existing conditions photographs and photosimulations from each KOP are presented with all other figures in VISUAL RESOURCES Appendix VR-4.

Elements of the Visual Setting

To assess the existing visual setting, staff considered the following elements:

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. Low visual quality describes landscapes that

[4] The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

Viewer Concern

Viewer concern is a measurement of the level of viewer interest regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. Travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists, to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

Types of Visual Change

To assess the visual changes that the project would cause, staff considered the following factors:

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability

to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view (scale dominance). A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature (spatial dominance). The level of dominance can range from subordinate to dominant.

View Blockage

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality features causes adverse visual impacts. The degree of view blockage can range from none to high.

APPENDIX VR – 3

LIGHTING COMPLAINT RESOLUTION FORM

Russell City Energy Center City of Hayward, Alameda County, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
Description of corrective measures taken: Complainant's signature: _____ Date:
Approximate installed cost of corrective measures: $ Date installation completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct: Plant Manager's Signature:

(Attach additional pages and supporting documentation, as required.)

VISUAL RESOURCES APPENDIX VR – 4: VISUAL RESOURCES FIGURES

VISUAL RESOURCES FIGURES 1 THROUGH 15

VISUAL RESOURCES APPENDIX VR – 5: LETTERS FROM LANDOWNERS AGREEING TO OFFSITE LANDSCAPING AND LETTER FROM HARD AGREEING TO MITIGATION PROPOSAL FOR VIEW BLOCKAGE OF MT. DIABLO

ARCHON®

GROUP

May 9, 2002

Mr. Alex Ameri, P.E.
Deputy Director/Utilities
Department of Public Works
City of Hayward
777 B Street
Hayward, CA 94541-5007

SUBJECT: LANDSCAPE ENHANCEMENTS, WHITESELL BUSINESS PARK

Dear Mr. Ameri:

We understand that Calpine Corporation has applied for City of Hayward permits and a California Energy Commission (CEC) certificate to build a merchant power plant north of the Whitesell Business Park on Whitesell Street in Hayward. We further understand that the CEC Staff have suggested that Calpine look into the feasibility of providing landscape trees to screen views of the plant from the Hayward Shoreline Interpretive Center and parking lot of the Whitesell Business Park. Calpine has offered to plant trees mutually acceptable to Calpine, the City of Hayward and us, at Calpine's expense: 1) in the landscaping islands of the parking lot to the west of the buildings; 2) within the 15-foot-wide sloping area to the west of the parking lot (on 40-foot centers); and 3) in the landscaped zone along the eastern edge of the parking lot (between the parking lot and buildings).

As part-owners of the Whitesell Business Park, we hereby grant Calpine a revocable license for access to Whitesell Business Park to plant such trees in the parking lot's landscaping islands and to the west of the parking lot as will cause us to be in full compliance with our landscape plan provided that Calpine agrees to indemnify, defend and hold us harmless from and against any and all claims, liabilities, damages and expenses (including attorneys' fees and costs) arising from Calpine's presence at Whitesell Business Park or from any activity or thing done, permitted or suffered by Calpine and its agents, contractors and employees. As a further condition to such license, Calpine must agree to assume all risk of any damaged property or injury to persons while at Whitesell Business Park. We also agree to consider placement of trees in the landscaped area around the buildings and patios at the parking lot's eastern border on a case-by-case basis. Please put us in contact with Calpine to discuss the scheduling of the effort and other specifics.

If you have any questions about this matter, please contact me at (213)633-5800.

Sincerely,

WXI/AJP Real Estate Limited Partnership, a Delaware limited partnership
By: WXI/AJP Gen-Par, Inc., a Delaware corporation, General Partner

By: _____
Nancy M. Haag
Assistant Vice President

Equity Office Properties Trust | Watergate Office Towers
2200 Powell Street, Suite 200
Emeryville, California 94608
phone 510.594.5600 fax 510.594.5808
www.equityoffice.com

Equity Office

RECEIVED
APR 12 2002
Dept. of Public Works

Mr. Alex Ameri, P.E.
Deputy Director/Utilities
Department of Public Works
City of Hayward
777 B Street
Hayward, CA 94541-5007

RE: Landscaping Enhancements, Bay Center Distribution Center

Dear Mr. Ameri:

We understand that Calpine Corporation has applied for City of Hayward permits and a California Energy Commission (CEC) certificate to build a merchant power plant north of our Bay Center Distribution Center on Whitesell Street in Hayward. We further understand that the CEC Staff have suggested that Calpine look into the feasibility of providing landscape trees to screen views of the plant from the Hayward Shoreline Interpretive Center and parking lot of the Bay Center Distribution Center. Calpine has offered to plant trees on the west side of our building and parking lot.

As owners of the Bay Center Distribution Center, we accept Calpine's offer to plant trees on the west side of our building and parking lot. Please put us in contact with Calpine to discuss the scheduling of the effort and other specifics.

If you have any questions regarding this matter, please contact me at 510-594-5600.

Sincerely,

Jose Hanna,
Project Manager

RJH/mkn

Cranbrook
GROUP, INC.

VIA US MAIL

April 15, 2002

RECEIVED
APR 17 2002
Dept. of Public Works

Mr. Alex Ameri, P.E.
Deputy Director/Utilities
Department of Public Works
City of Hayward
777 B Street
Hayward, CA 94541-5007

RE: LANDSCAPE ENHANCEMENTS, WHITESELL BUSINESS PARK

Dear Mr. Ameri:

We understand that Calpine Corporation has applied for City of Hayward permits and a California Energy Commission (CEC) certificate to build a merchant power plant north of the Whitesell Business Park on Whitesell Street in Hayward, owned by Cranbrook Realty Investment Fund, LP dba Whitesell Business Center. We further understand that the CEC Staff have suggested that Calpine look into the feasibility of providing landscape trees to screen views of the plant form the Hayward Shoreline Interpretive Center and parking lot of Whitesell Business Center. Calpine has offered to plant trees at their sole cost and expense, including irrigation costs and other costs associated with such planting of trees, within the 15-foot wide sloping area to the west of the parking lot (on 40-foot centers).

As owners of Whitesell Business Center, we accept Calpine's offer to plant the trees to the west of the parking lot, however all specifications require the prior written consent of owner. Please put us in contact with Calpine to discuss the scheduling of the effort and other specifics.

If you have any questions about this matter, please contact me at (510) 568-1140 ext. 10.

Sincerely,

Meredith Mead
Assistant Property Manager
Whitesell Business Center

7677 Oakport Street, Suite 180, Oakland, CA 94621-1920 • Phone: (510) 568-1140 • Fax: (510) 568-4591

HAYWARD AREA RECREATION AND PARK DISTRICT

1099 'E' Street, Hayward, California 94541-5299 • Telephone (510) 881-6700 FAX (510) 888-5758

April 11, 2002

Mr. James Leahy
Calpine Corporation
4160 Dublin Blvd.
Dublin, CA 94568

RE: RUSSELL CITY ENERGY CENTER OFFSITE VISUAL ENHANCEMENTS

Dear Mr. Leahy:

The Hayward Area Recreation and Park District has reviewed the proposed offsite visual enhancements specifically relating to blockage of view toward Mount Diablo from the Hayward Shoreline Interpretive Center deck. We are in substantial agreement over the mitigation plan and agree with Calpine that the proposed amenities will sufficiently mitigate the loss of view from the Hayward Shoreline Interpretive Center. Please note we have discussed with Calpine that our wording and specific locations including coordinating the architectural features will be done by the Hayward Area Recreation and Park District at Calpine's expense.

We look forward to working with Calpine and coordinating these items to match other enhancements that are underway at the Hayward Shoreline Interpretive Center. These items will match the architectural features, text style, and other features that will go a long way in enhancing the Shoreline area for public use. If this requires further clarification, please don't hesitate to call me at 510-881-6716.

Sincerely,

Eric Willyerd
Superintendent of Parks

EW:jn

040211 Leahy

BOARD OF DIRECTORS
Louis M. Andrade
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GENERAL MANAGER
Wes Asmussen

WASTE MANAGEMENT

Testimony of Alvin Greenberg, Ph.D.

INTRODUCTION

This section discusses potential impacts of the proposed Russell City Energy Center from the generation and management of hazardous and nonhazardous wastes. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts from wastes generated during project construction, operation and closure. A brief overview of the project is provided, as are discussions regarding selected CEQA checklist items with respect to hazardous and nonhazardous wastes. A discussion of additional items listed in the Hazards and Hazardous Materials portion of the checklist may be found in the **Hazardous Materials Management** section of this staff analysis.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Superfund Amendments and Reauthorization Act of 1986

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

Resource Conservation and Recovery Act, RCRA (42 U.S.C. § 6922)

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

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

Title 40, Code of Federal Regulations, Part 260

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

STATE

California Health and Safety Code § 25100 et seq. (Hazardous Waste Control Act of 1972, as amended)

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

California Health and Safety Code, Section 41700

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."

Title 14, California Code of Regulations, § 17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)

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

Title 22, California Code of Regulations, § 66262.10 et seq. (Generator Standards)

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

LOCAL

The Alameda County Department of Environmental Health has the responsibility for administration and enforcement of the California Integrated Waste Management Act for non-hazardous solid waste for the proposed energy center and advanced water treatment plant.

The City of Hayward Fire Department, Hazardous Materials Office is the local agency, which administers and enforces compliance with the Hazardous Waste Enforcement Act. This agency will also regulate hazardous waste management handling and disposal procedures at the proposed energy center.

SETTING

Calpine/Betchtel (2001) proposes to construct, own, and operate an energy generating facility in the Industrial Corridor of the City of Hayward, Alameda County, California, to be known as the Russell City Energy Center (RCEC). The RCEC will be a natural gas-fired, combined-cycle electric generating facility rated at a nominal gross generating capacity of 600 megawatts (MW). The proposed 14.7-acre project site is located at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility (WPCF). Approximately 11 acres of the 14.7-acre proposed site for the RCEC is currently occupied by the transmitter facilities of Radio Station KFAX, AM 1100. Please refer to the Project Description section for more detail.

Both hazardous and non-hazardous wastes will be generated during site preparation, construction, and operations. The site presently contains hazardous waste from previous activities and three environmental conditions at the Runnells Industries parcel (one of two parcels that make up the RCEC) include blasting sand, a small plume of total petroleum hydrocarbons (TPH), and low levels of VOC contaminants in the groundwater. The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) is now the lead agency directing site remediation and the City of Hayward Fire Department Hazardous Materials Office is participating in over-sight. During project construction and operation, minor quantities of hazardous wastes will be generated which are typical of a modern natural gas-fired generating facility. Licensed hazardous waste transporters using proper containers and transportation procedures conforming to applicable Caltrans requirements would be used to remove these wastes from the site.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport or use of hazardous materials?		X		
b) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
c) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?		X		
UTILITIES AND SERVICE SYSTEMS – Would the project:				
d) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
e) Comply with federal, state, and local statutes and regulations related to solid waste?			X	

DISCUSSION OF IMPACTS

A) Hazard Created by Transport or Use of Hazardous Materials

The Russell City Energy Center would generate minor quantities of hazardous wastes during project construction and operation. The project owner would be a generator of hazardous waste and would fall under the jurisdiction of federal law (the Resource Conservation and Recovery Act – 42 U.S.C. 6901 et seq.) and state law (California Hazardous Waste Control Act – Health and safety Code Sections 25100 et seq.). These laws govern the storage, transport, and disposal of hazardous waste. Condition of Certification WASTE-7 requires RCEC to obtain a hazardous waste generator identification number.

The types of hazardous wastes normally generated during construction include waste lubricating oil, cleaning solvents, paints, batteries, oily rags and absorbent, and welding materials. Additional wastes such as concrete and contaminated soil will be generated during demolition and removal of existing foundations. Section 8.14.2.1 of the Application lists the types and quantities of wastes which may be

generated during construction, as well as the proposed management method for each. All hazardous wastes generated during construction will be recycled or disposed of in a licensed hazardous waste treatment or disposal facility.

Hazardous waste generated during construction could also include contaminated soil most likely resulting from the Runnels Industry portion of the site which will be removed or relocated (see section **c** below).

Hazardous wastes generated during facility operation include spent air pollution control catalyst, used oil, paint and thinner waste, batteries, cooling tower sludge, solvents, and turbine washwater. Table 8.14-1 of the Application lists the types and quantities of hazardous wastes generated during operation of the facility, as well as the proposed management method for each.

Some of the hazardous wastes can be recycled, such as used oil, solvents, batteries, and the spent SCR catalyst. All hazardous wastes generated during construction and operation will be managed in accordance with federal and state laws and regulations. The wastes will be properly characterized, and transported offsite to approved treatment, storage, or disposal facilities by licensed hazardous waste haulers. To help ensure the use of appropriate hazardous waste disposal facilities, staff proposes Condition of Certification WASTE-1, which requires the project owner to notify staff of any known enforcement actions against hazardous waste facilities or companies used for project wastes.

Because the waste management and disposal measures proposed by the Applicant will comply with all applicable federal and state laws, ordinances, regulations, and standards, staff expects that there will be no significant impacts to the public or the environment from disposal of project-related hazardous wastes. Since final facility design and operational procedures may impact the amounts and types of wastes ultimately generated, the project owner would be required to submit waste management plans for construction and operation to staff under Condition of Certification WASTE-2.

B) Hazards Created Near Schools

There are no schools within one-quarter mile from the proposed project. The refinery complex is immediately bordered by 470 acres of mostly undeveloped Valero property to the south and west and general industrial uses to the north and east. From the project site, all land is zoned general industrial development for one mile to the south and east.

In all cases, licensed hazardous waste transporters using proper containers and transportation procedures conforming to applicable Caltrans requirements would be used. Staff therefore concludes that impacts from the transportation of project-related hazardous wastes would be less than significant.

C) Location on Site Included on Specific Government List (Gov. Code Sect. 65962.5)

Calpine/Betchtel performed a Phase I Environmental Site Assessment (ESA) in March 2001 for the RCEC and AWT plant site (AFC Appendix 8.14). The purpose of the investigation was to identify recognized environmental conditions at the site resulting from present or past activities. Based on the Phase 1 ESA and previous investigations, there are three environmental conditions at the Runnells Industries parcel (one of two parcels that make up the RCEC): 1) Underground storage tanks were removed in 1993, but were back-filled with used blasting sand. The previous owner requested closure. 2) A small plume of total petroleum hydrocarbons (TPH) is located near the boundary of the Runnells and KFAX parcels. This plume is the result of metal washing. The plume's source has been corrected by installation of an oil-water separator. Investigations show that the plume is stable and self-remediating. 3) There are VOC contaminants in the groundwater at the Runnells Industries parcel at low levels. These may be from an off-site source, according to previous investigations. Runnells Industries has sought to close all three issues with the Alameda County Health Care Services Agency, Environmental Protection Division. The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) is now the lead agency directing site remediation and the City of Hayward Fire Department Hazardous Materials Office is participating in over-sight. Calpine/Betchtel will be required to prepare a closure plan for all three conditions and a schedule for implementation. Conditions of Certification WASTE-5 and –6 require RCEC to prepare a Remedial Action Plan (RAP) and associated soil management workplan for contamination at the Runnells parcel.

Soil sampling does not guarantee that all contamination will necessarily be detected. Thus, proposed Conditions of Certification WASTE-3 and –4 would require that a Professional Engineer or Geologist be given oversight authority if unforeseen contamination is encountered.

D) Served by Landfill with Sufficient Capacity

Nonhazardous waste disposal sites suitable for disposal of project-related construction and operation wastes are identified in Table 8.14-2 of the AFC (Calpine/Betchtel 2001). The landfill closest to the site, the Altamont Landfill, has approximately 16.3 million cubic yards of remaining capacity and a remaining life of about 6 years. The Altamont Landfill expansion has been approved and will add 160 million tons of capacity with an estimated lifespan of 46 years. During construction of the proposed project including the advanced wastewater treatment plant, a total of 265 tons of nonhazardous waste is anticipated to be generated. This will consist of 150 tons of wood, glass, paper, and plastic, 80 tons of concrete, and 35 tons of metal. Recycling will reduce much of the wastes, including paper, wood, glass, plastic, and scrap metal. Project operation will generate minimal amounts of nonhazardous waste, on the order of 70 cubic yards per year. Thus, the total amount of nonhazardous waste generated from project construction and operation will contribute only a fraction of one percent of available landfill capacity. Staff concludes that this potential impact will be less than significant.

E) LORS- Compliance

Project-related wastes will be placed in covered dumpsters and transported by certified haulers to appropriately permitted facilities in accordance with applicable laws, ordinances, regulations, and standards. Staff concludes that the proposed project will comply with all applicable federal, state, and local statutes and ordinances regarding solid waste management.

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.

ENVIRONMENTAL JUSTICE

In the **Socioeconomics** section of this staff analysis, staff presents census tract information that shows no significant poverty populations within six miles of the project, however, there are minority populations within six miles of the project. Since staff has concluded that there will be no significant direct or cumulative waste management-related impacts, there will also be no significant impact to any minority populations that have been identified. Therefore, there are no environmental justice issues.

FACILITY CLOSURE

During any type of facility closure (see staff's **General Conditions and Compliance** 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 and Compliance** 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.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

AGENCY COMMENTS

EBRPD(8-8)-9 Staff concludes that if all applicable LORS and the recommended Conditions of Certification are followed, contaminated soils and wastes generated during site preparation, construction, and operation will be contained on the site and removed in a manner which will not result in off-site impacts. Therefore, no significant impact will occur to visitors, wildlife, vegetation, or wetlands.

CONCLUSIONSAND RECOMMENDATIONS

As discussed under section (g) above, staff concludes that the project will comply with all applicable LORS pertaining to the management and disposal of nonhazardous wastes. Additionally, because Calpine/Betchtel must implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes), staff also concludes that the project will comply with all applicable LORS pertaining to the management and disposal of hazardous wastes. All hazardous wastes will be properly managed on site, transported by permitted hazardous waste haulers, and treated or disposed at permitted facilities.

Management of hazardous and nonhazardous wastes generated during construction and operation of the Russell City Energy Center will not result in any significant adverse impacts if Calpine/Betchtel implements the waste management procedures described in the Application (Calpine/Betchtel 2001) and staff's proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-2 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CEC 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 30 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 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 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-3 The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of construction, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-4 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist 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. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the San Francisco Regional Water Quality Control Board, the Alameda County Department of Environmental Health, City of Hayward Fire Department Hazardous Materials Office, and the Berkeley Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within 5 days of their receipt.

WASTE-5 The project owner shall prepare a Remedial Action Plan (RAP) for the known soil and groundwater contamination present on the Runnells Industry portion of the site and submit this plan to the SFRWQCB, the City of Hayward Fire Department Hazardous Materials Office, and the CPM. This RAP shall

include a schedule for the remediation of the site prior to the commencement of construction activities.

Verification: 60 days prior to any earth moving activities, the project owner shall submit the RAP to the SFRWQCB, the City of Hayward Fire Department Hazardous Materials Office, and the CPM for approval 60 days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification.

WASTE-6 The project owner shall provide a soil management workplan providing the methods which will be used to properly handle and/or dispose of soil which may be classified as hazardous or contain contaminants at levels of potential concern. The workplan will discuss, as necessary, the reuse of soil on site in accordance with applicable criteria to protect construction or future workers onsite, disposal of soil to a Class I (hazardous) landfill, and disposal to a Class II or III landfill. This workplan may be submitted as part of the RAP.

Verification: The project owner shall submit the soil management workplan to the CPM for approval 60 days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification.

WASTE-7 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.

REFERENCES

Calpine/Betchtel 2001. Application for Certification (01-AFC-7), submitted by Calpine/Betchtel Joint Development. Submitted to the California Energy Commission on May 22, 2001.

SOIL AND WATER RESOURCES

Testimony of Joe Crea, John Scroggs, Jim Henneforth and John Kessler

INTRODUCTION

In this analysis, staff examines the water and soil resource aspects of the Russell City Energy Center (RCEC) specifically focusing on the following areas:

- whether the project's demand for water affects surface or groundwater supplies;
- whether construction or operation will lead to accelerated wind or water erosion and sedimentation;
- whether project construction or operation will lead to degradation of surface or groundwater quality; and
- whether the project will comply with all applicable laws, ordinances, regulations and standards.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Clean Water Act

The Clean Water Act (33 USC section 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 a National Pollutant Discharge Elimination System (NPDES) Permit. Stormwater discharges during construction and operation of a facility also fall under this act and must be addressed through either a project specific or general NPDES permit. In California, the nine Regional Water Quality Control Boards (RWQCB) administer the requirements of the Clean Water Act.

Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. The Army Corps of Engineers (ACOE) issues site-specific or general (nationwide) permits for such discharges.

Section 401 of the Clean Water Act provides for state certification of federal permits allowing discharge of dredged or fill material into waters of the United States. These certifications are issued by the RWQCBs. For this project, any 401 certification may be handled with Waste Discharge Requirements (WDR's) under the California Water Code.

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 Region Water Quality Control Plan. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes with elevated temperature to the state's waters. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDRs) permit. Because wastewater streams other than storm water (permitted separately) are being discharged into the existing East Bay Discharger's Authority (EBDA's) outfall, for which City of Hayward is a co-permittee, or discharged as influent into the City of Hayward's Water Pollution Control Facility (WPCF), which is a sanitary sewer and treatment system, no new WDR's are required for the RCEC Project.

California Water Code

Section 13552.6 of the Water Code specifically identifies 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.

STATE POLICIES

State Water Resources Control Board Policies

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 Power plant Cooling (adopted by the Board on June 19, 1976 as 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 come from, in order of priority: 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 also addresses cooling water discharge prohibitions.

LOCAL

County of Alameda

The County of Alameda requires a Flood Canal Tie-In Permit issued by Alameda County Public Works Agency. The application for the Flood Canal Tie-In Permit will include review of drainage plans and flood control issues.

City of Hayward

The City of Hayward's General Plan sets forth policies that address drainage, erosion control, hazardous material spill control, facility siting in flood zones, storm water discharge, and discharge of wastewater to the municipal sewer system. In addition, the City of Hayward will issue a Pretreatment Permit, as part of executing the Commercial Agreement, which will include among other things acceptance of several of the RCEC wastewater streams into the City's Water Pollution Control Facility (WPCF). The Applicant, as a part of the Energy Commission's certification, will have to comply with grading, excavation and erosion control standards consistent with City of Hayward's requirements (see **Condition of Certification Soil and Water 1**).

SETTING

The land use in the vicinity of the RCEC is primarily industrial, municipal and open space, with the nearest residences situated 0.8 miles from the site. The RCEC will be constructed within 14.7 acres being acquired by the Applicant that is currently being used for commercial and industrial uses associated with a radio station transmitter facility and a metal coatings facility. The RCEC project area is located within the City of Hayward Industrial Corridor as designated in its General Plan, adjacent to the City of Hayward's wastewater treatment plant known as the Water Pollution Control Facility, in western Alameda County. The RCEC site is located on relatively flat topography, with marshlands located to the west between the site and San Francisco Bay.

GROUNDWATER

The RCEC site lies within the South East Bay Plain Groundwater Basin (SEBP Basin), an alluvial aquifer system consisting of poorly consolidated to unconsolidated lenses of gravel, sand, silt, and clay. The SEBP Basin covers an area of about 115 square miles, and underlies the communities of Oakland, Alameda, San Leandro, San Lorenzo, and the northern part of City of Hayward, including the RCEC Project site. Based on a water budget study developed for the mid-1990's, it is estimated that the net effect of withdrawal and recharge results in a net recharge to the SEBP Basin of about 3,000 acre-feet/year. Water quality above 200 feet contains relatively high concentrations of TDS, chloride, nitrate and sulfate, whereas water quality improves at about 200 feet below ground surface (bgs) with TDS of less than 450 mg/l.

SURFACE WATER HYDROLOGY

The RCEC site is located within the San Lorenzo Cone drainage basin. The basin drains an area of west Hayward comprising some 9,700 acres, into South San Francisco Bay. The watershed of potential impact lies in the Arroyo de Alameda between Sulphur Creek and Mt. Eden Creek, the largest streams in the RCEC vicinity.

Sulphur Creek, located 1.7 miles to the northwest, and Mt. Eden Creek, located 1 mile to the south, are among the primarily ephemeral streams in the area that flow into South San Francisco Bay. Most storm water runoff from the RCEC site flows into an existing flood canal, through which water is channeled to the west into several nearby marsh and wetland areas. The East Bay Regional Parks District carefully manages fresh and saltwater flows into these wetland areas. During the dry season, water is distributed to maintain the desired wetland habitat for waterfowl and the endangered salt marsh harvest mouse species. During the wet season, excess water is channeled into San Francisco Bay at Johnson Landing outfall.

SOILS

Reyes Clay covers the entire 14.7-acre RCEC site. Soil types for the linear facilities tend to be of Reyes Clay and other similar soil types. The RCEC site and linear facilities are not currently used for agriculture, nor is there any remaining agriculture development within the City of Hayward. Although the land was used for agriculture from before 1939 until at least 1965, the RCEC land is naturally high in salts, and is not designated by the CA Department of Conservation as either Prime Farmland or Farmland of Statewide Importance. These soils tend to be very deep and poorly drained and are characteristic of clays formed in tidal flats. Reyes Clay has low erosion potential, low permeability and a high potential for shrinking and swelling.

The RCEC site is currently gently sloped, decreasing in elevation to the south. It ranges in elevation up to about 11.7 feet to the north to as low as 5 feet to the south. In preparation for the construction of RCEC facilities, the site elevation will be raised by importing and compacting fill material to achieve a nearly flat finished grade approximately 12 feet above MSL. Construction best management practices (BMPs) will be implemented for control of erosion and storm water drainage. Storm water collected during construction will be routed to the sediment retention basins, and as quality allows, discharged to the existing flood control channel that runs along the southern boundary of the site. The flood control channel discharges into marsh and wetland areas that ultimately can drain into San Francisco Bay.

Following construction, the RCEC site will be surfaced with either crushed rock, paving or grass, and storm water will flow into one of three storm water collection systems. For the AWT, storm water will be collected and discharged into the headworks of the City of Hayward's WPCF. For non-process areas of the RCEC, such as drainage from roof drains and parking lots, storm water will be collected and routed to the on-site detention basins before release to the existing flood control channel.. For process areas, storm water will be collected and routed through oil/water separators, and then conveyed to a holding tank for testing. If appropriate discharge criteria is met, the storm water will then be discharged into the headworks of the City of Hayward's WPCF. If wastewater discharge criteria is not met, the wastewater will be treated as necessary before discharge to the WPCF, or transported off-site to an approved reuse/disposal facility.

The AWT will occupy about 2.5 acres of the 14.7-acre site. The 1.1 mile, 230 -kV electric transmission line will follow the alignment of an existing transmission line to PG&E's Eastshore Substation, replacing six existing towers with six new towers. The 0.9 mile natural gas pipeline will primarily follow an existing utility corridor across

Berkeley Farms property and along existing roadway (Enterprise Road). The recycled water supply and wastewater discharge pipelines will cross Enterprise Road between the City of Hayward's WPCF and the RCEC. Temporary and permanent BMPs will be employed during and after construction, respectively.

SOIL AND WATER CONTAMINATION

A Phase I Environmental Site Assessment (ESA) prepared for the RCEC site identifies site conditions of potential concern, including potential impacts to both soil and groundwater from previous industrial activities. Previous investigations have detected concentrations of volatile organic compounds (VOC's) and methyl tertiary butyl ether (MTBE) in groundwater, and concentrations of total petroleum hydrocarbons (TPH) in soil.

The RCEC site is divided into two parcels, with one currently used by Runnels Industries for metal coating, and the second used by KFAX as a radio transmitter facility. The areas of existing soil and groundwater contamination appear to be located primarily on the Runnels parcel, apparently due to processes and underground storage tanks used in support of the historical metal coatings operation. Contamination may also be present on the adjacent KFAX parcel, as may have resulted from historic practices of dumping sand-blast waste onto the KFAX parcel, contributions from storm water drainage patterns originating on the Runnels parcel and draining onto the KFAX parcel, and the potential for groundwater continuity between the two parcels. Expected sources of contamination at the Runnels parcel may have been eliminated for the most part, including the removal in 1993 of three underground storage tanks consisting of a 1,000-gallon tank storing solvent (Methyl Ethyl Ketone), a 1,000-gallon tank storing diesel fuel, and a 500-gallon tank storing gasoline. In addition, secondary containment has been established for waste storage areas, and wastewater is being treated in the steam cleaning area. The existing property owners have initiated requests to applicable regulatory authorities to bring site closure for these environmentally recognized conditions.

The Applicant, in acquiring the two parcels for the RCEC development, will be assuming responsibility for obtaining site closure to industrial land use standards prior to development. Based on discussions and a site meeting on August 14, 2001 between the Applicant, Hayward Fire Department and San Francisco Bay RWQCB, the Applicant is expecting to conduct additional Phase II ESA sampling activities to supplement data from previous Phase II ESA efforts conducted during 1996 through 1998. The Applicant will prepare a site characterization work plan for approval by the San Francisco Bay RWQCB, and following additional observations, will follow-up with a report of findings and recommendations. Based on its discussions with regulatory authorities, the Applicant expects that site closure can be achieved by around the end of this year (Calpine/Bechtel 2001d).

RCEC WATER SUPPLY

The RCEC proposes to use recycled water for its steam production and for cooling through use of a hybrid, wet/dry plume-abated mechanical draft cooling tower. The City of Hayward's Water Pollution Control Facility (WPCF), located directly across Enterprise Drive from the proposed RCEC, will serve secondary wastewater effluent as

the source of recycled water supply. The City of Hayward's secondary effluent will be treated by the Applicant to qualify as tertiary effluent at the proposed Advanced Water Treatment (AWT) Plant under Title 22 standards. The AWT Plant facilities will primarily be located on about 2.5 acres of the RCEC site, except for the solids handling facilities, which will be located at the existing WPCF. Upon completion of construction of the AWT Plant, the City of Hayward will own and operate the AWT Plant, which is being designed to be expandable in the future. The AWT Plant will be capable of supplying two grades of tertiary-treated recycled water to future customers, one which has been disinfected and micro-filtered, and a finer grade that has been further purified by reverse osmosis as required for the RCEC operations. Potable water for domestic, fire water, and as a secondary backup for process and cooling supply to the project will be provided by the City of Hayward's domestic water supply.

The AWT will include 6 million gallons of tertiary-treated storage, sized to makeup supply to the RCEC in the event that supply from the WPCF is interrupted. In the unlikely event that supply from the WPCF is interrupted for more than 36 hours during peaking operations, which historically is the WPCF's longest outage of record, the treated storage would be exhausted at the AWT, and domestic water supply from the City of Hayward would be used for temporary makeup to the RCEC, which is not expected to be needed for more than a few hours. (Ameri 2001 and Calpine/Bechtel 2001e) Total annual recycled water use for the RCEC will average 3,730 acre-feet/year (based on an average daily flow of 3.33 million gallons per day (mgd)), and peak flows of 5,904 acre-feet/year (based on peak daily flows of 5.27 mgd). The recycled water demands account for losses in the water treatment process, to produce the final product demand of 2.41 mgd during average conditions, and 3.8 MGD during peak conditions. About 95 percent of the final product water will be used as makeup water for the RCEC cooling tower. The remaining 5 percent will be used for process makeup water to produce steam and plant general service water. Potable water demands will be approximately 2 gallons per minute (gpm) (2.2 acre-feet/year) to meet the limited domestic demands of the project.
Soils and Water Table 1 summarizes the use of water for RCEC operations and construction, and the discharge of wastewater associated with the proposed RCEC.

The RCEC would result in water use of approximately 16 gpm (.023 mgd) for turbine injection, 1,661 gpm) (2.39 mgd) for cooling tower makeup, 37 gpm (.053 mgd) for HRSG feed water makeup, and 18 gpm (.026 mgd) for miscellaneous uses, for a total average demand of about 1,732 gpm (2.49 mgd) , and a peak daily demand of about 2,638 gpm (3.80 mgd).

Soils and Water Table 1
RCEC Facility Water Balance

Component Stream	Average I		Maximum	
	Avg. Daily (gpm)	Avg. Daily (mgd)	Max. Daily (gpm)	Max. Daily (mgd)
Turbine Injection Water	16	.023	24	.035
Cooling Tower Makeup	1,661	2.39	2,536	3.65
HRSG Feed Water Makeup	37	.053	56	.081
Polished Filtration Reject Stream	8	.012	12	.017
Plant Washdown	10	.014	10	.014
Total Water Consumption (Net)	**1,732**	**2.49**	**2,638**	**3.80**
Blowdown HRSG's	Recycled To Cooling Tower		Recycled To Cooling Tower	
Blowdown Cooling Tower	33	.048	46	.066
Plant Drainage	53	.076	66	.095
Sanitary Wastewater	2	.003	2	.003
AWT Wastewater	638	0.919	1,014	1.46
Total Wastewater (Net)	**726**	**1.05**	**1,128**	**1.62**
Construction Water	**250**	**.36**	**250**	**.36**

Note: Blowdown from the cooling tower reflects 50 cycles of concentration.

CITY OF HAYWARD WATER SUPPLY

The primary water supply to the RCEC will be secondary effluent from the City of Hayward's Water Pollution Control Facility . The WPCF currently treats the city's wastewater at an average rate of about 13.3 mgd. Water supply demand for the RCEC will result in a net reduction of effluent discharge from the WPCF from 13.3 to about 9.5 mgd, due to water losses from the cooling tower evaporation of the RCEC Project. Because of the recycling of several RCEC waste streams back to the WPCF, the WPCF will realize a net increase in its influent from about 0.92 mgd average, to about 1.46 mgd peak, resulting in an increase in WPCF influent loading ranging from 14.2 – 14.8 mgd. The permitted capacity of the City of Hayward's WPCF is 16.5 mgd.

The City and County of San Francisco (CCSF) provide fresh water supply to the City of Hayward. CCSF's water supply source is derived from the Hetch Hetchy Reservoir. The water is treated with chlorine by City and County of San Francisco, and then treated with fluoride by City of Hayward. The City of Hayward has no comprehensive water treatment plant because the water supplied is already treated. Although the City of Hayward's contract with the City and County of San Francisco has no limit on its quantity of water supply, the City of Hayward's conveyance system has a current capacity of about 32 mgd. Average demand is about 19 mgd, and the peak demands are estimated to range in the mid to high 20's of mgd. The City of Hayward is planning to increase its conveyance system capacity over the next 2 years by adding a booster pump station to its 42-inch diameter water transmission line, which is expected to increase supply capacity from about 32 to about 38 mgd. The impact of supplying the RCEC during rare periods of WPCF outages, with water from the City's treated fresh

water supply would be an increase of 2.41 mgd during average conditions, and up to 3.8 mgd during peak conditions.

COOLING PROCESS

The RCEC will use a hybrid, wet/dry plume-abated mechanical draft cooling tower. As a result of the quality of recycled water produced by the AWT Plant, the cooling tower will be able to operate between 50 – 100 cycles of concentration. The design will also minimize the visual plume of water vapor emitting from the cooling tower.

The hybrid plume abated cooling tower combines the technologies of both wet and dry cooling towers. The wet system reduces the cooling water temperature due to the effects of evaporation. This in turn allows the steam cycle to operate more efficiently. Dry cooling systems employ a radiator type of heat exchanger where the cooling water is circulated and cooled by the ambient air. The dry system has the advantage of using very little, if any water and eliminates visible plume. The hybrid plume abated system combines these two types of towers to gain the efficiency of a wet system that produces a lower cooling water temperature with the dry system that eliminates the visible plume.

Water is lost in the wet cooling cycle due to evaporation and blow down. As the cooling water circulates it becomes increasingly concentrated. To control this buildup of minerals and avoid scaling a portion of the water is discharged as blown down and replaced with additional treated water.

WASTEWATER DISCHARGE

Wastewater discharges from the RCEC power plant (excluding the AWT Plant discussed above), consist of cooling tower blow down, plant drainage, sanitary wastewater and storm water. A portion of the RCEC wastewater is recycled within the power plant, consisting of the Heat Recovery Steam Generator (HRSG) blow down, at an average flow of 28 gpm, which will be recycled to the cooling tower basin. One of the primary wastewater streams that will be discharged off-site from the power plant to the headworks of the WPCF consists of the cooling tower blow down, which will occur after 50 – 100 cycles of concentration at an estimated average discharge rate of 33 gpm (46 gpm peak). The other primary wastewater stream to be discharged to the headworks of the WPCF consists of plant drainage, including wash down water, equipment leakage, and drainage from the facility equipment areas, which is estimated to average 53 gpm (66 gpm peak). Plant drainage will be collected and conveyed through an oil/water separator before being discharged into the headworks of the WPCF. Wastewater derived from cooling tower blow down and plant drainage will comply with permit requirements under the City of Hayward's pretreatment program, and will be considered already permitted under the existing NPDES Permit with the RWQCB for the EBDA outfall inclusive of the discharge from the City of Hayward's WPCF. Sanitary wastewater, estimated to average 2 gpm, will be discharged into the sanitary sewer line for treatment at the WPCF.

Stormwater Discharge

Storm water from the RCEC will be managed separately between process and non-process areas. Chemical storage and handling areas will be covered and should not be impacted during a storm. Open process areas such as the lube oil facility, transformer pits, etc. will be curbed to contain the maximum 25-year, 24-hour design storm runoff in addition to the volume of the largest storage container. Storm water will be conveyed to an oil/water separator, and then into a holding tank where the water will be sampled to determine its quality. If the sampled water complies with surface discharge criteria, it will be conveyed to the headworks of the WPCF. If surface discharge criteria is not met, the water in the holding tank will be treated as necessary before discharging as influent into the WPCF.

Storm water from non-process areas will be conveyed through an oil/water separator into the storm water management pond. The storm water management pond will serve to detain runoff, and discharge at flows less than pre-project conditions. Discharge will occur into the existing drainage channel along the southern boundary of the RCEC site, which flows through marshland before discharging into San Francisco Bay. Consistent with the criteria specified by the Alameda County Flood Control and Water Conservation District, the storm water facilities will be sized to accept the 25-year, 24-hour design storm runoff, and through utilization of the detention ponds, discharge will not exceed pre-project flows occurring under a 15-year, 24-hour recurrence event, estimated at 9 cubic feet per second (cfs) for these conditions. Based on analysis of storm water discharges under conditions of storm frequency ranging from 2 – 100 years, the post-project discharges of storm water are less than pre-project discharges in every case. The storm water discharge will be subject to obtaining a General NPDES Permit for Discharge of Storm Water Associated with Industrial Activities from the RWQCB.

Advanced Water Treatment (AWT) Plant

Wastewater discharges from the AWT Plant include combined liquid streams from copper removal/treatment, solids clarification, and microfilter backwash (0.92 mgd average, and 1.46 mgd peak). The treated AWT wastewater stream will discharge into the WPCF effluent pipeline, where it will be chlorinated, and conveyed into the East Bay Discharger Authority's (EBDA's) outfall for discharge into San Francisco Bay. The combined wastewater discharge from the WPCF and AWT Plant, estimated at 9.5 mgd, will be less than current discharges from the WPCF alone, estimated at 13.3 mgd, due to water losses from the cooling tower evaporation of the RCEC Project. In addition, the quality of the combined wastewater discharge will be improved with respect to some constituents, particularly with respect to removal of copper and suspended solids as accomplished in the AWT Plant. Copper loadings will be reduced 33% from the combined discharge of WPCF and AWT Plant, and 8% on the basis of the entire mass loadings from the EBDA discharge. EBDA holds the existing NPDES Permit, of which the City of Hayward is a member agency and co-permittee. Based on discussions between the RWQCB and the City of Hayward, the combined wastewater discharge from the AWT and WPCF will be permitted under the existing NPDES Permit, with the City of Hayward providing any necessary revisions in order to incorporate description of the new process elements of the AWT. Waste discharge requirements under EBDA's NPDES Permit are not expected to change as a result of overall facility modifications in

integrating the AWT with the WPCF. (Ref: City of Hayward letter to RWQCB, June 15, 2001 included in RCEC Supplemental Information, June 19, 2001)

A storm water discharge will also occur from the AWT, estimated not to exceed 0.26 mgd assuming the maximum precipitation event over a 24-hour period from a 25-year storm (4.01"). Because storm water from the AWT will discharge into the headworks of the WPCF, which is a municipal sanitary sewer system, no new NPDES Permit will be necessary for discharge of the AWT storm water.

Soils and Water Table 2 summarizes the quality of AWT Plant effluent compared to the City of Hayward's WPCF effluent, the quality of the combined WPCF/AWT effluent, and the waste discharge requirements for discharge in the EBDA outfall as permitted by the San Francisco Bay RWQCB.

Soils and Water Table 2
WPCF, AWT Plant, and Combined WPCF/AWT Plant Effluent Qualities vs. EBDA Discharge Limits

Characterisitic	WPCF Effluent	AWT Effluent	Combined WPCF/AWT Effluent	EBDA Limit	Type of Limit
Flow (mgd)	8.04	1.46	9.50		
PH	8	7-8	7-8	6-9	
Total Dissolved Solids	564	2227	820		
Total Suspended Solids	20	38	22.8	30, 45	Monthly, Weekly avg.
CBOD	17	53	22.3	25,40	Monthly, Weekly avg.
Hardness	160	204	167		
Calcium	33	64	37.8		
Magnesium	14	8	13.1		
Manganese	0.06	0.2	0.08		
Sodium	133	72	124		
Potassium	16	55	22.0		
Total Alkalinity	255	255	255		
Silica	13	11	12.7		
Sulfate	44	460	108		
Chloride	153	263	170		
Cadmium	0.0006	0.0022	0.0008		
Chromium	0.0051	0.018	0.007		
Copper	0.0235	0.020	0.0229	0.023	Interim daily max.
Cyanide	0.003	0.010	0.0041	0.021	Interim daily max.
Lead	0.0022	0.003	0.0024	0.056	Max. daily limit
Mercury	0.00005	0.0001	0.00006	0.00021	Interim monthly avg.
Nickel	0.012	0.034	0.0154	0.021	Interim daily max.
Nitrate	6.0	3.6	5.6		
Fluoride	2.2	7.9	3.1		
Arsenic	0.0017	0.006	0.002		
Boron	0.5	0.8	0.5		
Iron	1.4	4.5	1.9		
Selenium	0.0012	0.004	0.0016	0.05	Max. daily limit
Silver	0.0018	0.006	0.0024	0.023	Max. daily limit
Zinc	0.073	0.071	0.073	0.58	Max. daily limit

Note: All concentration values are expressed in units of mg/l, unless indicated otherwise.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOIL AND WATER RESOURCES -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially deplete or degrade local or regional surface water supplies, particularly fresh water, or fail to implement reasonable alternatives for water conservation?			X	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X		
e) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?		X		
f) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?		X		
g) Otherwise substantially degrade water quality?		X		
h) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOIL AND WATER RESOURCES -- Would the project:				
i) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?		X		
j) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
k) Inundation by seiche, tsunami, or mudflow?				X

DISCUSSION OF IMPACTS

A) Violation of Water Quality or Wastewater Standards

As proposed, the RCEC will cause a net decrease in the quantity of wastewater discharged into San Francisco Bay from about 13.3 to 9.5 mgd. The quality of wastewater will not change significantly, with the concentration of some constituents increasing slightly, and others decreasing slightly. All constituents will meet waste discharge requirements as specified under EBDA's NPDES Permit, for which the City of Hayward is a co-permittee. The AWT will include provisions for copper removal treatment in order to assure compliance with EBDA's waste discharge requirements. The City of Hayward, which will be receiving wastewater streams as either influent or effluent to its WPCF, (inclusive of all wastewater other than storm water from non-process areas of the RCEC), has consulted with the San Francisco Bay Regional Water Quality Control Board (RWQCB). Based on discussions between the RWQCB and City of Hayward, the combined wastewater discharge from the AWT and WPCF will be permitted under the existing NPDES Permit. The City of Hayward will provide any necessary revisions in order to incorporate a description of the new process elements of the AWT. Waste discharge requirements under EBDA's NPDES Permit are not expected to change as a result of overall facility modifications in integrating the AWT with the WPCF (Hayward 2001).

B) Depletion of Groundwater

The RCEC does not propose to use groundwater as a source of water supply. The use of recycled water will have no effect on groundwater supply. Therefore, groundwater supplies will not be depleted.

C) Depletion or Degradation of Surface Supplies

The RCEC's use of primarily recycled water will avoid any substantial depletion or degradation of local or regional surface water supplies, particularly fresh water. The RCEC will use 3.33 mgd on average and 5.27 mgd on peak of the secondary effluent available from the City of Hayward's WPCF, which operates on average at

about 13.3 mgd. The WPCF has a permitted capacity of 16.6 mgd. Treated fresh water supply will be used for domestic purposes in the RCEC facility, and is estimated to average 2 gpm, equating to about 2.2 acre-feet/year. Treated fresh water will also serve as a backup to the recycled water supply in the unlikely event that the City of Hayward's WPCF is interrupted for more that 36 hours during peak RCEC operations, or 48 hours during average RCEC operations, causing the on-site treated water storage at the AWT Plant to be depleted.

The WPCF has never experienced an interruption of greater than 36 hours, and most outages have occurred for less than 24 hours. Outages at the WPCF can be caused from accidental spills of a substance into the sanitary sewer. In order to avoid biological upset to the WPCF, the tainted sewage can be passed through primary clarification and then conveyed into a holding pond for special treatment. If an outage in excess of 36 hours were to occur, the City of Hayward believes that the extended duration would only be a matter of hours, rather than days. Even so, the City of Hayward's domestic water supply, with a capacity of about 32 mgd, has adequate capacity to serve RCEC's demands if using fresh water, averaging 2.4 mgd, and peaking at 3.8 mgd, amidst the City's existing peak daily demands estimated in the mid to high 20's of mgd. Further, the City could cycle supply of fresh water to RCEC during off-peak hours, by restoring the 6 million gallons of treated water storage in the AWT for supply to RCEC during on-peak hours. Fresh water demands for the RCEC steam production and cooling processes are less than the recycled water demands because the fresh water will not require the same level of treatment before use, thus reducing the portion of supply that becomes micro-filter backwash and reverse-osmosis concentrate waste streams. Under peak demands, the RCEC represents utilization of about 12% of the City's capacity, potentially causing the City's overall supply of 32 mgd to be nearly fully utilized if delivered during on-peak hours. If the City implements its plans for installation of a booster pump station on the 42" pipeline over the next two years, a safer margin of reserve capacity will be available on the order of 6 mgd or greater. The City of Hayward believes that it is unlikely that the RCEC will ever need to depend on fresh water supply (Ameri 2001, Calpine/Bechtel 2001e).

D) Alteration of Existing Drainage or Cause Erosion

The entire site, consisting of 14.7 acres of land, will be disturbed during construction of the facility, with surface grading and compaction of new fill to raise the elevation of the site. This area will be subject to erosion until surface cover comprised of pavement, gravel or grass can be placed as part of final construction activities. The southwest corner of the RCEC site, may currently be within the 100-year flood plain; however, the Applicant has indicated that the increase in elevation of the site will be outside the flood plain. Please refer to Responses to Agency and Public Comments section and Soil and Water #7 within the SA for further discussion regarding flood plain issues.

The RCEC development will not change or alter the drainage patterns in the area, which adjoins marshland before draining into San Francisco Bay, nor cause backwater effects to any structures located upstream in the drainage. The primary drainage in the area consists of an existing drainage channel located along the

southern boundary of the RCEC site, and its course and capacity will not be altered as a result of the RCEC (Calpine/Bechtel 2001d).

The applicant has indicated that adequate erosion and sedimentation controls will be employed, and has provided a Draft Erosion and Sediment Control Plan as part of its Draft Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity. The applicant will be required to provide a final Erosion and Sediment Control Plan and SWPPP for review and approval prior to the start of construction.

Best Management Practices (BMPs) would be employed to minimize erosion during and after construction. The BMPs include surrounding all work areas by dikes, drainage swales, sand bags, or combinations of these to prevent run-on and uncontrolled runoff. During construction, the swales will direct sediment laden storm water into sediment retention basins. Sediments would settle within the basin and clean stormwater would be discharged into the nearby channel. The access road, and areas used for parking, staging and laydown will be stabilized using course aggregate, to limit sediment tracking and dust. Exposed ground surfaces will be watered to further reduce dust, without creating runoff. Earth movement activities will be conducted expeditiously to minimize exposure to erosion, and will include installation of filter fabric fencing, hay bale fencing or sand bags as appropriate.

The areas that will be disturbed for the construction of the linear facilities will have their drainage patterns reestablished after construction. Existing roadways and utility right-of-ways will be used to the maximum extent possible. If additional roadways are necessary, they will be sited and graded to minimize potential disturbance to erosion and runoff patterns. Best engineering management practices and drainage control will be implemented to minimize impacts from construction activities (Calpine/Bechtel 2001a).

Following construction, the site surface will be covered with paving, gravel or grass, and stormwater will flow into distinctive stormwater management systems. These systems will separate storm water from the AWT and process areas of the RCEC, from storm water originating in non-process areas of the RCEC. Storm water from the AWT and process areas of the RCEC will discharge into the headworks of the WPCF, whereas, storm water from non-process areas of the RCEC will be conveyed to the storm water detention basins before being discharged into the existing drainage channel along the southern boundary of the RCEC site (Calpine/Bechtel 2001c).

In addition to construction being regulated under a Erosion and Sediment Control Plan, both a construction-related Storm Water Pollution Prevention Plan (SWPPP) and General NPDES Storm Water Permit for Construction Activity are also required from the applicant. In addition, a General NPDES Storm Water Permit for Industrial Activity will regulate storm water during RCEC operations.

E) Alteration of Watercourse or Increase Surface Water

Drainage at the RCEC site has been designed to prevent flooding of permanent facilities and roads, both on-site and off-site, and to maintain storm water flows at or below pre-project flows.

Storm water developed over the 2.5 acre AWT Plant site is estimated to not exceed 0.26 mgd assuming the maximum precipitation event over a 24-hour period from a 25-year storm (4.01inches). This water will be conveyed into the headworks of the WPCF, and thus incrementally, will result in a post-project reduction of storm water flow that would otherwise drain to the existing drainage channel located along the southern boundary.

Storm water developed within the balance of the 12.2 acres for the RCEC generation facilities will be managed separately between process and non-process areas. Open process areas such as the lube oil facility, transformer pits, etc. will be curbed to contain the maximum 25-year, 24-hour design storm runoff in addition to the volume of the largest storage container. Storm water drainage will be conveyed to an oil/water separator, and then into a holding tank where the water will be sampled to determine its quality. Storm water that complies with surface discharge criteria will be conveyed to the headworks of the WPCF. Storm water that does not comply with surface discharge criteria will be treated as necessary before discharging as influent into the WPCF. The system of individual containments, a holding tank and conveyance to the WPCF serve to maintain storm water flows incrementally below pre-project levels.

Storm water from non-process areas will be conveyed through an oil/water separator into the storm water detention ponds. The storm water detention ponds will serve to detain runoff, and discharge at flows no greater than pre-project conditions. Discharge will occur into the existing drainage channel along the southern boundary of the RCEC site, which flows through marshland before discharging into the San Francisco Bay. The storm water facilities will be sized to accept the 25-year, 24-hour design storm runoff consistent with the criteria specified by the Alameda County Flood Control and Water Conservation District's criteria for sizing storm water facilities, resulting in storm water releases no greater than the runoff predicted from the pre-project site for a 15-year, 24-hour recurrence event, with estimated flows not to exceed 9 cfs under these conditions. Based on analysis of storm water discharges under conditions of storm frequency ranging from 2 – 100 years, the post-project discharges of storm water are less than pre-project discharges in every case (Calpine/Bechtel 2001b).

F) Create Runoff that Exceeds Stormwater Drainage

The storm water facilities will be sized to accept the 25-year, 24-hour design storm runoff consistent with the criteria specified by the Alameda County Flood Control and Water Conservation District's criteria for sizing storm water facilities, resulting in storm water releases no greater than the runoff predicted from the pre-project site during a 15-year, 24-hour recurrence event (Calpine/Bechtel 2001b).

Preventative measures to avoid pollution of storm water include separation of drainage facilities for the AWT Plant, and RCEC process and non-process areas. The bulk of process equipment involved in the generation of electric power and treatment of makeup water for the power generation steam cycle will be enclosed in either buildings or modular enclosures that also serve to control noise and contain fire hazards. Only those elements of the power generation systems that must be outdoors for heat dissipation or electrical isolation will receive rainfall that could potentially become contaminated by contact with the equipment. All such equipment will be mounted in curbed areas that will be sized to contain the design storm in addition to containing the maximum quantity of oil or other material that might leak from the equipment. In addition, water quality will be monitored in the holding tank and detention ponds consistent with SWRCB standards for monitoring of storm water before discharge. Therefore, adequate protection measures are planned to prevent storm water runoff from being released in a contaminated state (Calpine/Bechtel 2001e).

G) Degradation of Water Quality

The project's waste will be discharged in accordance with applicable laws; therefore, no impacts to water quality are expected. Hazardous materials stored at the RCEC site will be contained within buildings, modular enclosures, or for outdoor equipment, will have curbs sized to contain the design storm and the contents of the largest container. In addition, water quality will be monitored in the holding tank and detention ponds consistent with SWRCB standards for monitoring of storm water before discharge. Storm water will be managed during construction and operation consistent with requirements of the General Permit for Discharge of Storm Water Associated with Construction Activity and the General NPDES Permit for Discharge of Storm Water Associated with Industrial Activity respectively, as administered by the San Francisco Bay RWQCB (Calpine/Bechtel 2001a).

During construction/excavation activities, if the groundwater generated during dewatering is determined to have some level of contamination, mitigation measures consisting of proper testing, treatment, and disposal will be required in order to satisfy the discharge limits of the RCEC's NPDES permit or conditions of site closure activities (see Condition of Certification, **Soil & Water 5**). Non-contaminated groundwater encountered and requiring dewatering during construction will be managed in conformance with BMP's for erosion control prepared under the SWPPP for Construction Activities.

Any contaminated soils encountered during excavation will have to be disposed of in a manner consistent with LORS to avoid any potential release of contaminants to water resources. In order to identify possible soil contamination that may be encountered during construction, the Applicant has agreed to perform additional Phase II investigations, and prepare a site assessment map to further delineate contaminated areas. Contaminated areas will be identified on construction excavation plans, and any soil and groundwater encountered in these areas will be segregated and held on-site for sampling and analysis, until proper handling, treatment or disposal can be determined. Stockpiled soil will be covered to prevent run-on or runoff, and groundwater will be stored in appropriate tanks or containers.

Typical soil sampling requirements are a 4-point composite sample for every 500 to 1,000 cubic yards of soil. Analytes will be selected based on Phase II Site Assessment results (Calpine/Bechtel 2001e).

Please refer to the **Waste Management** section for more conditions of certification regarding contaminated soils.

H) Place Housing Within a 100-Year Flood Hazard Area

The RCEC development will not increase the risk to housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map.

I) Place Structures that would Impede or Redirect Flood Flows Within a 100-Year Flood Hazard Area

The southwest corner of the RCEC site may currently be within the 100-year flood plain, but with the increase in elevation of the site to approximately 12 feet, the site will be outside the flood plain. The RCEC development will not change or alter the drainage patterns in the area, which adjoins marshland before draining into the San Francisco Bay, nor cause backwater effects to any structures located upstream in the drainage. The primary drainage in the area consists of an existing drainage channel located along the southern boundary of the RCEC site. This channel will not be altered as a result of the RCEC. The placement of soil fill material in the southwest corner of the RCEC site will likely be considered a placement of fill material within wetlands of the United States, and thus require a Section 404 Permit from the Army Corps of Engineers. If a Section 404 Permit is required, a Section 401 Water Quality Certification and/or Waste Discharge Requirements will also be required from the San Francisco Bay Regional Water Quality Control Board. Conditions of Certification **Bio-7** and **Bio-8** specify that the Applicant is to obtain and comply with the conditions of the aforementioned permits, respectively.

The Applicant, in consultation with Alameda County, the City of Hayward, and FEMA was advised during a meeting on August 15, 2001 that FEMA has no further concerns about the RCEC. All parties agreed that the increase in grade to approximately elevation 12 feet (above MSL) will be protective with respect to the 6.5 foot flood zone elevation. Further, because the site is adjacent to a tidal area that is not a designated waterway, filling-in a small portion of the 100-year inundation zone would not be of concern for FEMA. The Applicant was advised to submit a request for a flood zone map revision to the City of Hayward. FEMA will then issue a conditional letter of map revision (CLOMR). Once the project is built, the Applicant should submit as-built plans to the City of Hayward to obtain the final letter of map revision (LOMR). **Condition of Certification Soil and Water 7** specifies that the Applicant submit requests for flood zone map revision and as-built plans to the City of Hayward as directed by the agencies (Calpine/Bechtel 2001d).

J) Expose Persons or Property to Flood Hazards

The RCEC will not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of failure of a levee or dam.

All storage facilities included in the project development are of minimal size, and will be designed according to applicable building codes including resistance to loadings from earthquakes.

K). Inundation by Seiche, Tsunami, or Mudflow

The RCEC is not expected to be exposed to inundation by seiche, tsunami or mudflow. The 1906 Earthquake in San Francisco of earthquake magnitude 7.8, only generated a tsunami wave of approximately 10 cm in height. The primary threat along the Central CA coast is from distant tsunamis generated by earthquakes along subduction zones (overlap of tectonic plates). Based on the experience from the 1906 earthquake, relatively little wave energy is transmitted through the Golden Gate into San Francisco Bay. Further, the RCEC is setback from the bay shoreline, providing another margin of safety. Therefore, tsunamis do not appear to be a threat to the RCEC. (USGS 2001)

CUMULATIVE IMPACTS

The project will not significantly change the volume or quality of wastewater discharge as proposed. The RWQCB has determined that no changes to the discharge requirements of the existing NPDES permit for the EBDA outfall to San Francisco Bay will be necessary. Staff concludes there are no significant cumulative impacts.

Construction and operational activities related to the RCEC project may cause an increase in cumulative wind and water erosion. However, implementation of the SWPPP would ensure that RCEC would not contribute significantly to cumulative erosion and sedimentation impacts.

The project has the potential to contribute significantly to cumulative post-construction urban runoff impacts through its discharge of process-related pollutants and typical urban runoff pollutants. This potential impact is avoided by the Applicant's plans to construct secondary containment around process areas, and to route drainage through an oil/water separator into a holding tank where the water will be sampled to determine its quality. Storm water from process areas that complies with surface discharge criteria will be conveyed to the headworks of the WPCF. Storm water that does not comply with surface discharge criteria will be treated as necessary before being discharged as influent to the WPCF. Storm water from non-process areas will be conveyed through an oil/water separator into the detention ponds. The detention ponds, as well as portions of the RCEC plant surfacing includes seeded areas for establishing grass that will serve as a filter for pollutants. Storm water during project operations will also be monitored for quality consistent with requirements under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity. No stormwater-related significant cumulative impacts are affected.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is greater than fifty percent within a six-mile radius of the proposed Russell City Energy Center power plant (please refer to **Socioeconomics Figure 1** in this Staff

Assessment), and Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Based on the Soil and Water Resources analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project. Therefore, there are no Soil and Water Resources environmental justice issues related to this project.

FACILITY CLOSURE

The RCEC is expected to operate for a minimum of 20 years. Closure options range from "mothballing," with the intent of a restart at some time, to the removal of all equipment and facilities.

The decommissioning plan will be submitted to the Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans will be required. The plan will address all concerns in regard to potential erosion and impacts on water quality.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

COUNTY OF ALAMEDA

Alameda-1: In staff's discussion with Alameda County regarding the potential project effects within the 100-year flood plain, Alameda County encouraged the Applicant to coordinate analysis of the flood plain issue with representatives of Alameda County, City of Hayward and FEMA.

Response: During an August 8, 2001 Data Request Coordination Meeting between the Applicant and Energy Commission staff, staff informed the Applicant regarding Alameda County's recommendation, and provided names and phone numbers for the respective agency contacts. In addition, staff has prepared Condition of Certification – **Soil & Water 7**, to assure that the flood plain mapping is revised in accordance with guidelines from the agencies.

SAN FRANCISCO REGIONAL WATER QUALITY CONTROL BOARD

SFBRWQCB-1: In its letter dated December 4, 2001 to the CEC, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) stated that disposal of contaminated soil and/or discharge of contaminated groundwater requires appropriate approvals from the Board.

Response: In addressing the potential for encountering contaminated soil or groundwater, Condition of Certification **Soil & Water 5** specifies that the project owner must provide evidence of compliance with the Site Assessment and Remediation Work Plan as approved by the City of Hayward Fire Department and San Francisco Bay RWQCB.

SFBRWQCB-2: In its letter dated December 4, 2001 to the CEC, the SFBRWQCB states that the Cumulative Impacts Section should include a discussion of the

potential for the project to contribute significantly to cumulative post-construction urban runoff impacts through its discharge of process-related pollutants and typical urban runoff pollutants.

Response: Please see addition to **Cumulative Impacts** above in reference to Page 3.9-18.

SFBRWQCB-3: In its letter dated December 4, 2001 to the CEC, the SFBRWQCB states that it appears the Applicant has proposed to implement additional storm water treatment measures that may not be explicitly required by the General Industrial Permit, and that there does not appear to be a related condition requiring this.

Response: Please see **Soil & Water 3**, requiring the Applicant to obtain CEC staff approval of a Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity, with review and concurrence from the SFBRWQCB, that will include final operating drainage design and specify BMP's and monitoring requirements. CEC staff will review and approve the final Industrial SWPPP for consistency with the project description and BMP's proposed under the Draft SWPPP.

SFBRWQCB-4: In its letter dated December 4, 2001 to the CEC, the SFBRWQCB states that the storm water detention basin should be designed to appropriately treat approximately 85% of average annual runoff from the site with consideration of geometry and vegetation in the design of the basin. In addition, alternatives to an oil/water separator should be considered for pre-treatment upstream of the detention basin.

Response: The CEC staff's review and approval of the final SWPPP for Industrial Activity and the Applicant's design of associated storm water facilities under **Soil & Water 3** has been revised to include review and concurrence of the plans by the San Francisco Bay Regional Water Quality Control Board to assure the adequacy of the design to maintain water quality consistent with LORS. Staff has determined that the applicant has provided sufficient information to satisfy this assessment for licensing. As per current compliance reviews, staff will provide a complete technical review of the final SWPPP's and incorporate the Board's comments into the review process.

SFBRWQCB-5: In its letter dated December 4, 2001 to the CEC, the SFBRWQCB requests that specific sections be cited from the San Francisco Bay Basin Water Quality Control Plan (Basin Plan).

Response: Staff has referred to the Basin Plan on Page 3.9-2 under LORS – State – Porter-Cologne Water Quality Act in a consistent level of detail as with other staff assessments in the certification of power plants before the CEC.

HAYWARD-1: In its letter dated January 22, 2002 to the CEC, the City of Hayward (City) requested staff to note that there will be no net increase in influent to the Water Pollution Control Facility (WPCF) as the flow from the RCEC will consist of treated wastewater diverted from the WPCF to the advanced water treatment facility and then returned to the WPCF.

Response: Staff agrees with the City's comment that the Advanced Water Treatment (AWT) facility will further treat effluent from the WPCF for use in the RCEC. However, the result of discharging wastewater from the AWT back to the headworks of the WPCF, rather than continuing as an effluent stream for discharge into San Francisco Bay as it does currently, will be an incremental increase in the influent to the WPCF on the order of 0.92 mgd average, to about 1.46 mgd peak.

HAYWARD-2: In its letter dated January 22, 2002 to the CEC, the City of Hayward (City) requested staff to revise Conditions of Certification Soil & Water 1 and 8.

Response: Staff agrees with the City's proposed changes, and has revised accordingly with one minor modification to the wording in Soil & Water 1.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined the proposed project will result in less than significant impacts to the public or the environment and will comply with LORS provided the foloowing Conditions of Certification are adopted.

PROPOSED CONDITIONS OF CERTIFICATION

The following conditions have been developed for the project:

SOIL & WATER 1: Prior to beginning any site mobilization activities, the project owner shall obtain CPM approval for a Grading and Erosion Control Plan that addresses all project elements. The Grading and Erosion Plan shall include and be consistent with the standards normally required under the City of Hayward's Grading Permit. The plan shall be submitted to the CPM for approval and to the City of Hayward and County of Alameda for review and comment.

Verification: The Grading and Erosion Control Plan shall be submitted to the CPM for review and approval, and to the City of Hayward (Public Works Department) and Alameda County (Public Works Agency) for review and comment at least sixty days prior to start of any site mobilization activities. The CPM, via concurrence from local agencies, must approve the final Erosion Control Plan prior to the initiation of any site mobilization activities.

SOIL & WATER 2: The project owner shall submit a Notice of Intent for construction under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity to the State Water Resources Control Board (SWRCB) and obtain CPM approval of the related Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity prior to beginning site mobilization activities. The SWPPP will include final construction drainage design and specify BMP's for all on- and off-site RCEC project facilities.

Verification: At least 60 days prior to the start of any site mobilization, the SWPPP for Construction Activity and a copy of the Notice of Intent for construction under the General NPDES Permit for Discharges of Storm Water Associated with Construction

Activity filed with the RWQCB, shall be submitted to the CPM. Approval of the final plan by the CPM must be received prior to initiation of any site mobilization activities.

SOIL & WATER 3: The project owner shall submit a Notice of Intent for operating under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity to the State Water Resources Control Board (SWRCB), and obtain CEC Staff approval prior to initiating project operation with review and comments from the San Francisco Regional Water Quality Control Board (SFBRWQCB) of the related Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity. The SWPPP will include final operating drainage design and specify BMP's and monitoring requirements for the RCEC project facilities. This includes final site drainage plans and locations of BMP's.

Verification: At least 60 days prior to the start of project construction , the SWPPP for Industrial Activity and a copy of the Notice of Intent for operating under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity filed with the RWQCB, shall be submitted to the CPM. Approval of the SWPPP plan by the CPM, with review and comment by the SFBRWQCB, must be received prior to initiation of project operation.

SOIL & WATER 4: The project owner shall use tertiary-treated water supplied from the City of Hayward's Advanced Water Treatment (AWT) Plant as its primary source for cooling and process water supply. Potable water may be used for cooling and process purposes only in the event of an unavoidable interruption of the AWT Plant supply, but not to exceed 45 days (1080 hours) in any one calendar year. Fresh water used for domestic purposes shall be metered separately from fresh water used for cooling and process water supply. The project owner will notify the CPM in writing if potable water is used for cooling or process purposes and provide an explanation of why the back-up supplies are being used.

The project owner shall prepare and submit to the CPM an annual summary, which will include the monthly range and monthly average of daily water usage in gallons per day, and total water (range and average) used by the project on a monthly and annual basis in acre-feet. The annual summary shall distinguish sources (recycled or potable) and the uses (cooling, process, domestic, etc...) of the specified source. The project owner will obtain copies of project water use records derived from the City of Hayward's recycled and potable water revenue meters.

Verification: The project owner will submit as part of its annual compliance report a water use summary to the CPM on an annual basis for the life of the project. Any significant changes in the water supply for the project during construction or operation of the plant shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change.

SOIL & WATER 5: Due to the potential for encountering soil contamination during construction at the site of the RCEC, it is necessary to perform additional Phase II investigations prior to any site mobilization activities, and prepare a site assessment map to further delineate contaminated areas. Contaminated areas shall be identified on construction excavation plans, and any soil and/or groundwater encountered in these areas will be segregated and held on-site for

sampling and analysis, until proper handling, treatment or disposal can be determined. Stockpiled soil will be covered to prevent run-on or runoff, and groundwater will be stored in appropriate tanks or containers. Soil sampling requirements shall consist of a 4-point composite sample for every 500 to 1,000 cubic yards of soil. Analytes are to be selected based on Phase II Site Assessment results. Details of the Site Assessment and Remediation Program are to be provided to the City of Hayward Fire Department and SFRWQCB for review and comment.

Verification: Sixty days prior to site mobilization, the project owner will provide evidence of compliance with the Site Assessment and Remediation Workplan as approved by the City of Hayward Fire Department and the San Francisco Bay RWQCB, and evidence of site closure. If the agencies direct remediation in conjunction with construction rather than prior to construction, then evidence of site closure must be provided 30 days prior to project operation. A quarterly status report will be provided to the CPM addressing site assessment and remediation activities, with the first status report due in January 2002, or within 30 days of AFC certification, whichever occurs first.

SOIL & WATER 6: Prior to any site mobilization activities, the project owner shall provide the CPM with the executed Service Agreement with the City of Hayward detailing the commercial terms for operation and maintenance of the Advanced Water Treatment (AWT) Plant, supply of recycled and potable water, and permitting under the City of Hayward's pretreatment program for treatment and disposal of process, cooling and stormwater waste streams at the City of Hayward's WPCF.

Verification: At least 60 days prior to beginning any site mobilization activities, the project owner shall submit to the CPM an executed Service Agreement with the City of Hayward detailing the commercial terms for operation and maintenance of the AWT Plant, supply of potable water, and permitting under the City of Hayward's pretreatment program for treatment and disposal of process, cooling and stormwater waste streams at the City of Hayward's WPCF.

SOIL & WATER 7: Prior to any site mobilization activities, the project owner shall provide the CPM with evidence of its request for a flood zone map revision with the City of Hayward, and FEMA's issuance of a conditional letter of map revision (CLOMR). The project owner shall provide evidence of submittal of as-built plans to City of Hayward in order to obtain a final letter of map revision (LOMR).

Verification: Thirty (30) days prior to site mobilization, the project owner shall submit to the CPM evidence of its request for a flood zone map revision with the City of Hayward, and FEMA's issuance of a conditional letter of map revision (CLOMR). Within sixty (60) days following the RCEC commercial operation date, the project owner shall submit to the CPM evidence of submittal of as-built plans to the City of Hayward in order to obtain a final letter of map revision (LOMR).

SOIL & WATER 8: Prior to the start of construction, the project owner shall provide the CPM with evidence of a Flood Canal Tie-In Permit to the Alameda County Public Works Agency (Flood Control and Water Conservation District).

Verification: At least thirty (30) days prior to construction, the project owner shall submit to the CPM evidence of submitting an Application for a Flood Canal Tie-In Permit to the Alameda County Public Works Agency, Flood Control and Water Conservation District.

REFERENCES

USGS 2001. Tsunami Record from the Great 1906 San Francisco Earthquake. http://walrus.wr.usgs.gov/tsunami/1906.html

Hayward 2001. City of Hayward letter to RWQCB, June 15, 2001 included in RCEC Supplemental Information, June 19, 2001.

Ameri, Alex 2001. Deputy Director of Public Works, City of Hayward. Personal communication with John Kessler, August 31, 2001.

Calpine/Bechtel 2001e. Calpine/Bechtel Responses to City of Hayward Data Requests - Russell City Energy Center. Submitted to the California Energy Commission on August 23, 2001.

Calpine/Bechtel 2001d. Additional Information in support of the Application for Certification for the Russell City Energy Center, Hayward, CA. Submitted to the California Energy Commission on August 28, 2001.

Calpine/Bechtel 2001c. Responses to the California Energy Commission Staff Data Requests, Russell City Energy Center. Submitted to the California Energy Commission on August 14, 2001.

Calpine/Bechtel 2001b. Russell City Energy Center Supplemental Information. Submitted to the California Energy Commission on June 19, 2001.

Calpine/Bechtel 2001a. Application for Certification, submitted by Calpine/Bechtel Joint Development, Pleasanton, CA. Submitted to the California Energy Commission on May 22, 2001.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin Greenberg, Ph.D.

INTRODUCTION

This section of the Final Staff Assessment (FSA) provides a discussion and evaluation of the potential impacts of the proposed Russell City Energy Center associated with worker safety and fire protection. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts during project construction, operation and closure. Energy Commission staff has determined that all CEQA checklist items for worker safety and fire protection are either "less than significant impact" or "no impact". A brief overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to these subject items. The section concludes with the staff's proposed monitoring and mitigation measures and with the inclusion of four conditions of certification. Please see Noise and Vibration section for a discussion of noise impacts on the project worker force.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

A framework, based on environmental laws, ordinances, regulations and standards (LORS), exists to reduce risks of accidents and reduce routine hazards. The following federal, state, and local laws generally apply **Worker Safety and Fire Protection.** Their provisions have established the basis for staff's determination regarding the significance and acceptability of the Russell City Energy Center.

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970. This 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). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define 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 general industry safety and health standards now in force under this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The congressional purpose of the Occupational Safety and Health 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 OSH Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 CFR §1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 CFR §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 §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 §337-560 and continuing with §1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards 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 §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 for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (8 CCR §5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 CFR §1910.1200) which established on the federal level an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, 8 CCR §3203 requires 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.
Applicable State requirements include:

- 8 CCR §339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act;

- 8 CCR §337, 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 § 25500 - 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 § 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 reflects the body of regulations published at Part 9 of Title 24 (H&S Code §18901 et seq.) pertaining to the California Fire Code.

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 (or locally enforced) requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9) which was adopted by the City of Hayward along with a fire prevention code for the city in 1999 (Ord. No. 99-06);
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.).
- Uniform Fire Code, Article 80, 1997
- City of Hayward Fire Department Development Standards

The California Fire Code requires that industrial plants submit plans for review and approval by the City of Hayward Fire Department.

SETTING

Calpine/Betchtel (2001) proposes to construct, own, and operate an energy generating facility in the Industrial Corridor of the City of Hayward, Alameda County, California, to be known as the Russell City Energy Center (RCEC). The RCEC will be a natural gas-fired, combined-cycle electric generating facility rated at a nominal gross generating capacity of 600 megawatts (MW). The proposed 14.7-acre project site is located at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility (WPCF). Approximately 11 acres of the 14.7-acre proposed site for the RCEC is currently occupied by the transmitter facilities of Radio Station KFAX, AM 1100. Site preparation work will consist of demolition of existing structures, site remediation and/or closure, and construction activities. Please refer to the **Project Description** section for more detail.

ANALYSIS OF IMPACTS

Industrial environments are potentially dangerous, during both demolition and construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the Russell City Energy Center Project to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards. The construction phase is expected to last approximately 2 years and will include site preparation, foundation work, instillation of major equipment and instillation of major structures.

During demolition, construction and operation of the proposed Russell City Energy Center Project there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
WORKER SAFETY/FIRE PROTECTION – Would the project:				
a) Exposes workers to inappropriate occupational safety and health risks and/or structural or chemical fires of undue duration?		X		
b) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
c) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
d) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
e) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

DISCUSSION OF IMPACTS

A) Expose Workers to Inappropriate Occupational Health and Safety Risks

The Russell City Energy Center project has provided adequate information that all occupational safety and health LORS will be followed and that fire avoidance, detection and suppression systems will be installed as per all LORS. Staff proposed COCs **Worker Safety 1 and 2** to ensure compliance with these LORS and that the City of Hayward Fire Department is provided with fire prevention plans prior to construction and operation. Additionally, construction machine diesel exhaust may pose an unacceptable risk and hazard to workers. If the Applicant implements staff's proposed COCs **Worker Safety 3 and 4**, staff believes that risks will be reduced to insignificant levels.

B) Impacts of Local Airports

The Russell City Energy Center project is not located within an airport use plan.

C).Impacts of Local Airstrips

The City of Hayward Airport is in the vicinity of the project (within 8000 feet) but there are no anticipated impacts from this or any other private airstrip.

D).Interference with Emergency Plans

It appears that the construction and operation of the project would improve upon the reliability of the local power system and therefore benefit the local emergency response capabilities. No interference with emergency response plans or emergency evacuation plans is anticipated. The City of Hayward Fire Department (HFD) is comfortable in its first response ability to a project fire should they be asked to respond. First response is estimated at 5 minutes. However, the second response which involves a truck company is estimated at 10 to 12 minutes, a time somewhat in excess of the desired 7 minutes. Additional resources or staffing is under review at this time by the HFD (personal communication with HFD Chief Larry Arfsten) but no request has been submitted by the City as yet.

E).Exposure to Wildland Fires

The proposed site is paved and hence clear of substantial vegetation. The immediate area south of the site is open space and brush. Fire hazard from vegetation is not a concern since those trees, brush, or grass in a buffer zone surrounding the site would be cleared or cut on a regular basis and fire suppression systems are adequate to combat a brush fire.

CUMULATIVE IMPACTS

Staff reviewed the potential for site preparation, construction and operation of Russell City Energy Center Project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City Of Hayward Fire Department. Staff found that at this time, cumulative impacts during operations would be insignificant.

APPLICANT'S PROPOSED MITIGATION

WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during demolition, construction and operation (AFC section 8.16.2). 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 demolition, construction and operational phases of the project.

demolition, construction and operation of a gas-fired combined cycle facility. In regards to worker exposures during construction activities, information provided by the applicant in the AFC sections on **Air Quality** and **Public Health** impacts demonstrates that workers may be exposed to construction equipment diesel particulate (PM_{10}) exhaust at airborne concentrations exceeding the Proposition 65 warning level. Therefore, staff proposes additional mitigation in the form of soot traps and low sulfur fuel, as well as outdoor air monitoring for particulates and appropriate personal protective equipment (i.e., respirators) if the Cal/EPA Reference Exposure Level (REL) or a cancer risk in excess of 10 in one million are exceeded.

Construction Safety Orders are published at 8 CCR § 1502, et seq. These requirements are promulgated by Cal/OSHA and are applicable to the demolition and construction phases of the project. The Demolition and 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); and
- 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; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to demolition and construction at the Russell City Energy Center project, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Upon completion of demolition and construction and prior to operations at the Russell City Energy Center Project, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203);
- Emergency Action Plan (8 CCR § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

In addition, the requirements 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 be applicable to the project. Written safety programs, which the applicant will develop, for the Russell City Energy Center Project will ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Safety Training Matrix (AFC Table 6.17-1), Facility Emergency Plan (AFC Table 6.17-3), and the Demolition and Construction Health and Safety Program (AFC Table 6.17-4). Prior to operation of the Russell City Energy Center Project, all detailed programs and plans will be provided pursuant to condition of certification **WORKER SAFETY-2**.

Safety and Health Program Elements

The Applicant provided the proposed outlines for both a Demolition and 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)

The Applicant will submit an expanded Demolition, Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to demolition, construction and operation of the project.

The IIPP will include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- Safety and Health Policy
- Work rules and safe work practices
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Specific safety procedures (e.g. fall protection, lockout/tagout, respiratory protection
- A training and instruction program.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (section 8.16.2.2).

The outline lists among many the following features:

- Supervisor/Emergency Coordinator role
- Health and Safety Manager role
- Public relations (news media, etc.) procedures
- Emergency notification list
- Emergency telephone number list
- Emergency equipment locations
- Accident reporting and investigation procedures
- Hazard communication procedures
- Spill containment and reporting procedures
- Releases into the environment and reporting
- Response procedures
- Site security measures
- Evacuation routes, assembly areas, and procedures
- Emergency plant shutdown procedures
- Fire response procedures
- Decontamination procedures
- Evacuation plan
- Personal protective equipment requirements

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

- General requirements
- Employee alarm/communication system
- Portable fire extinguisher placement and operation
- Fixed fire fighting equipment placement and operation
- Fire control methods and techniques
- Flammable and combustible liquid storage methods
- Methods for servicing and refueling vehicles
- Fire prevention training programs and requirements

Staff proposes that the Applicant submit a final Fire Protection and Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) and the City Of Hayward Fire Department for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies 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). The Russell City Energy Center Project operational environment will likely require PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and California Department of Health and Human Services Standards. Each employee will be provided with information pertaining to protective clothing and equipment.

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.

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (AFC page 8.16-9) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and

equipment for a sustained response would be required by the City Of Hayward Fire Department.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Elements include both fixed and portable fire extinguishing systems. A carbon dioxide fire protection system (FM200) will be provided for the combustion turbine and accessory equipment. Fire detection sensors will also be installed. The on-site fire suppression system is designed and operated in accordance with National Fire Protection Association standards and guidelines. Fire hydrants and hose stations will be connected to the existing City of Hayward system already in operation. A back-up diesel fuel powered water pump will be used in the event the main fire water pump loses power. The plant fire mains will also provide water for the aqueous ammonia storage area vapor suppression system. In addition to the fixed fire protection system, smoke detectors, combustible gas detectors, and portable extinguishers will be located throughout the plant with size, rating, and spacing in accordance with the Uniform Fire Code.

The applicant will be required to provide the final Fire Protection and Prevention Program to staff and to the City Of Hayward Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

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. A facility closure plan will be developed prior to closure to incorporate these requirements.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments were received.

CONUSIONS

If the Applicant for the proposed Russell City Energy Center Project provides a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program as required by conditions of certification **WORKER SAFETY 1, 2, 3** and **4** staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. Staff also concludes at this time that the proposed plant will not have significant impacts on local fire protection services. The proposed facility is located within an existing industrial area that is currently served by the local fire department. The fire risks of the existing facility are similar and thus pose no new or different demands on local fire protection services.

PROPOSED CONDITIONS OF CERTIFICATION

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

- A Construction Safety Program;
- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of Hayward Fire Department for review and comment prior to submittal to the CPM.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Injury and Illness Prevention Program. The project owner shall provide a letter from the City of Hayward Fire Department stating that they have reviewed and commented on the Construction the Construction Fire Protection and Prevention Plan and the Emergency Action Plan.

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

- an Operation Injury and Illness Prevention Plan;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the 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 also be submitted to the City of Hayward Fire Department for review and comment.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

WORKER SAFETY-3 The project owner shall prepare and submit to the CPM a Construction Operations Workplace Airborne Monitoring Program describing a diesel particulates monitoring program that will be implemented. This Monitoring Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM a copy of the final version of the Construction Operations Workplace Airborne Monitoring Program. It shall incorporate Cal/OSHA Consultation Service's comments, stating that they have reviewed and accepted the specified elements of the proposed Program.

REFERENCES

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1998 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.1997 Uniform Fire Code, Vol. 1. Published by the International Fire Code Institute comprised of the International Conference of Building Officials and the Western Fire Chiefs Association, Whittier, Ca.

ENGINEERING

ASSESSMENT

FACILITY DESIGN

Testimony of Shahab Khoshmashrab, Al McCuen and Steve Baker

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 engineering 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 engineering LORS, and in a manner that 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; 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 engineering 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 engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

Calpine/Bechtel Joint Development proposes to construct and operate a nominally rated 600-megawatt combined cycle power plant known as Russell City Energy Center (Calpine/Bechtel 2001a). One portion of the project, the Advanced Water Treatment Unit, will be deeded to the City of Hayward. The project will be located in the City of Hayward, Alameda County. The site will occupy approximately 14.7 acres located at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility. For more information on the site and related project description, please see the **Project Description** section of this document.

The project site is located in seismic zone 4. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices 10-A through 10-E (Calpine/Bechtel 2001a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (Calpine/Bechtel 2001a, Appendices 10-A through 10-E). Some of these LORS include; California Building Code (CBC), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Boiler Manufacturers Association (ABMA).

The City of Hayward Department of Public Works has adopted the recommendations contained in a report by Dames & Moore (1995) as a minimum standard for seismic design of new engineering projects for City facilities. The City of Hayward (the City) requires this report to be used for all Russell City Energy Center utility structures to be owned by the City, which includes the Advanced Water Treatment Unit.

ANALYSIS

The basis of this analysis is the applicant's proposed analysis and construction methods and list of engineering 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 10-A through 10-E 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 engineering LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance. Note that in the AFC, Appendix 10-A2.2.3, the applicant refers to 1997 UBC, Chapter 70 (Grading and excavation) which does not exist. The

corresponding chapter in the UBC is Appendix Chapter 33. This is a minor inconsistency, and does not jeopardize the likelihood of compliance with applicable engineering LORS.

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 engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects 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. The Advanced Water Treatment Unit will, in addition, be designed and constructed in accordance with the Dames & Moore (1995) report as a minimum standard for seismic design of City owned utility structures. 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 2001a, § 2.2.18.5) 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 power plant. 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 delegates typically include the local building official and/or 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 or Alameda County, or a third party engineering consultant, 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 delegates.

Staff has developed proposed Conditions of Certification to ensure 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 subject to CBO review and approval shall 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 engineering 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 subject to CBO review and approval, 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 engineering 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

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.

2. Staff has evaluated the 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 engineering LORS.

3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering 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. Staff will audit the CBO to ensure satisfactory performance.

4. 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 as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS. Energy Commission staff recommends that:

5. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;

6. The project be designed and built to the 1998 CBC (or other successor standard, if such is in effect when the initial project engineering designs are submitted for review);

7. The Advanced Water Treatment Unit be designed and built to the 1998 CBC and the Dames & Moore (1995) report as a minimum standard for seismic design of City owned utility structures; and

8. 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 engineering 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.) The project owner shall design, construct and inspect the Advanced Water Treatment Unit in accordance with the 1998 CBC and the Dames & Moore (1995) report as a minimum standard for seismic design of City owned utility structures. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

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 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 engineering 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 Prior to submittal of the initial engineering designs for CBO review, 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 to the CBO and to the CPM the schedule, the Master Drawing List, and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in Table 1 below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	2
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
HRSG Stack Foundation and Connections	2
HRSG Stack	2
CT Main Transformer Foundation and Connections	2
ST Main Transformer Foundation and Connections	1
Ammonia Storage Tank Foundation and Connections	1
Switchgear Building Structure, Foundation and Connections	1
Air Compressor Skid Foundation and Connections	1
Cooling Tower Foundation and Connections	1
CT Air Inlet Filter Foundation and Connections	2
Circulating Water Pumps Foundation and Connections	2
Demineralized Water Storage Tank Foundation and Connections	2
Surface Condenser Structure, Foundation and Connections	1
Warehouse/Maintenance Shop Structure, Foundation and Connections	1
Administration Building W/Control Room Structure, Foundation and Connections	1
Water Treatment Building/Laboratory Structure, Foundation and Connections	1
Gas Metering Area Structure, Foundation and Connections	1
Pumphouse Building Structure, Foundation and Connections	1
Boiler Feedwater Pump/Chemical Feed Building Structure, Foundation and Connections	1

Equipment/System	Quantity (Plant)
Boiler Feedwater Pump Building Structure, Foundation and Connections	1
Emergency Generator Foundation and Connections	1
Fire Water Pump Building Structure, Foundation and Connections	1
Rotor Air Cooler Foundation and Connections	2
Switchyard Control Room Structure, Foundation and Connections	1
Unit Auxiliary Transformer Foundation and Connections	2
Gas Scrubber/Heater Station Structure, Foundation and Connections	1
Closed Cycle Cooling Water Heat Exchanger Foundation and Connections	2
Closed Cycle Cooling Water Pump Foundation and Connections	2
Chlorination Skid Foundation and Connections	1
Advanced Wastewater Treatment Plant Structure, Foundation and Connections	1
Final Product Storage Tank Foundation and Connections	2
Condensate Pumps Foundation and Connections	3
Demineralized – RO Systems Foundation and Connections	3
Natural Gas Compressors Foundation and Connections	2
Switchyard, Buses, and Towers	I Lot
Potable Water Systems	I Lot
Drainage Systems (including sanitary drain and waste)	I Lot
High Pressure Piping	I Lot
HVAC and Refrigeration Systems	I Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with 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], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;

3. 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;

4. 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;

5. 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

6. 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 power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant 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 responsible engineers assigned to the project [1998 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible 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 requiring design review and inspection by the CBO. 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:

1. Review all the engineering geology reports, and prepare final soils grading report;

2. 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;

3. 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;

4. Recommend field changes to the civil engineer and RE;

5. 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

6. 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:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with engineering LORS;

4. Evaluate and recommend necessary changes in design; and

5. 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:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

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.

5. 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 in any work that has undergone CBO design review and approval, 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 transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of 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 that has undergone CBO design review and approval. 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]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [1998 CBC, Section 106.4.2, Retention of plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM in the next Monthly Compliance Report, (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. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

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 (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the documents described above to the CBO for design 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 earthworks 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 to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

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 for which a grading permit is required shall be subject to inspection by the CBO.

Protocol: If, in the course of inspection, it is discovered that the work is not being performed 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 of any major structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design 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 the following items (from **Table 1**, above):

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and

5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

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 60 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 of any structure or component listed in Table 1 of Condition of Certification GEN-2, above 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 engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

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 structural 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 toxic or hazardous materials, the project owner shall submit to the CBO for design 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 major piping or plumbing construction, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in Table 1, Condition of Certification GEN 2, above.

Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing 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, Section 108.4, Approval Required; 1998 California Plumbing Code, Section 103.5.4, Inspection Request, Section 301.1.1, Approval].

Protocol: The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

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);
Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
Title 24, California Code of Regulations, Part 2 (California Building Code); and
Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [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 major piping or plumbing construction listed in Table 1, Condition of Certification GEN-2 above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

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].

Protocol: 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 design review and approval, the above listed documents, 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 transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

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 design 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 CBC and other applicable codes. 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 CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 1998, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

Protocol: A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

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; and
7. lighting energy calculations.

Protocol: C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

1. receipt or delay of major electrical equipment;
2. testing or energization of major electrical equipment; and
3. 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 construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting

compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

Calpine/Bechtel. 2001 a. Application for Certification for the Russell City Energy Center (01-AFC-7). Submitted to the California Energy Commission, May 22, 2001.

Dames & Moore. 1995. Seismic retrofit study for the City of Hayward utility structures, Hayward, California: Consultant's report to City of Hayward, Public Works Department, Utilities Division.

GEOLOGY AND PALEONTOLOGY

Testimony of Neal Mace

INTRODUCTION

In this section staff discusses the geologic setting and hazards associated with the Russell City Energy Center Project and the potential impacts of the project to geologic and paleontologic resources. The first objective of this review 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 in a manner that protects environmental quality, and assures public health and safety.

Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geologic and paleontologic resources during project construction, operation and closure. The Geology and Paleontology section concludes with the staff's proposed monitoring and mitigation measures, contained in the Conditions of Certification.

LAWS, ORDINANCES, REGULATION AND STANDARDS

The applicable LORS are listed in pages 8.4-20, 8.4-21, and 8.8-11 of the 01-AFC-7. A brief description of the LORS regarding geologic hazards, geologic resources, and paleontologic resources follows:

FEDERAL

There are no federal LORS for geologic hazards and resources, grading, or paleontologic resources for the project.

STATE

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 incorporates the UBC by reference, and is a series of minimum standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading as found in Appendix Chapter 33) of civil structures. The CBC supplements the UBC's grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontologic resource or site, or a unique geologic 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 geologic 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 paleontologic resources, based on the standard-of-practice. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists), and are part of the LORS to which the project is subject.

LOCAL

The City of Hayward Department of Public Works has adopted the recommendations contained in a report by Dames & Moore (1995) as a minimum standard for seismic design of new engineering projects for City facilities. The City of Hayward Department of Community and Economic Development uses the CBC as the minimum design standard for private construction.

SETTING

Unconsolidated sediments deposited along the margin of San Francisco Bay underlie the proposed 14.7-acre project site. The underlying soils include plastic, poorly sorted, organic-rich clay and silty clay, with interbedded thin beds of well-sorted silt, sand, and fine gravel. The Applicant reported that borings drilled in the eastern portion of the project site encountered fill material to a depth of 3 feet, and a black, silty clay that extended to the maximum depth of boring (15 feet). Black clays are typically high in organic matter, and are generally susceptible to liquefaction or quick-clay conditions when subject to strong seismic shaking. The Applicant followed standard local practice and referred to these sediments site as "young Bay mud". The young Bay mud was deposited in a marine environment following the end of the last low sea-level stand about 11,000 years ago (Atwater et al., 1977). Because of its young age and marine origin, young Bay mud has limited potential as a host of scientifically unique fossils.

The Applicant speculates that the young Bay mud may be between 20 and 60 feet thick at the project site, and that it is underlain by more consolidated older Bay mud deposits. Young Bay mud deposits beneath the City of Hayward's Wastewater Treatment Plant, immediately north of the RCEC site are typically less than 15 feet thick (Cooper Clark and Associates, 1959 and 1972). The young Bay mud deposits beneath the Treatment Plant site are typically underlain by stiff to very stiff clays and local layers or lenses of loose to medium dense silty sand (Judd Hill and Associates, 1979).

Energy Commission staff reviewed the California Division of Mines and Geology publication "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," dated 1994 (CDMG 1994). No active or potentially active faults are known to cross the power plant footprint. The closest known active fault is the Hayward fault, which is located 5 kilometers (3.1 miles) east of the project site. This fault is designated a class "A" fault under the CBC (a fault with a maximum magnitude earthquake greater than 7 and a slip rate in excess of 5 mm/year). The

maximum magnitude earthquake for the segment of Hayward fault closest to the project is a moment magnitude 7.0 event.

In addition, the San Andreas fault is located 22 kilometers (13.64 miles) west of the site and the Calaveras fault is located 20 kilometers (12.4 miles) east of the site. These faults are also capable of generating a major earthquake. The Working Group on California Earthquake Probabilities (WGCEP, 1999) concluded that there is a 70% probability of at least one magnitude 6.7 or greater quake striking the San Francisco Bay region before 2030. By fault segment, the probabilities are 17% for the south segment of the Hayward fault, 15% for the Peninsula segment of the San Andreas fault, and 18% for the north segment of the Calaveras fault. An earthquake on any of these faults will produce strong ground shaking at the proposed RCEC site.

Using the Abrahamson-Silva 1993 attenuation relationship, a moment magnitude 7.0 earthquake on the southern segment of the Hayward fault would produce an estimated peak horizontal bedrock acceleration for the power plant site of 0.5g. This value is generally consistent with the California Division of Mines and Geology (CDMG) Map Sheet 48 (Petersen et. al., 1996), which predicts a peak ground acceleration with a 10 percent probability of exceedance in 50 years of between 0.5 and 0.7g for the project area. However, since the site will overlie younger bay mud (CBC Soil Profile Type S_f), the site will likely experience amplification of seismic shaking and potential liquefaction during an earthquake. Section 1629.3.1 of Chapter 16 of the CBC specifically states that Soil Profile Type S_f requires a site-specific evaluation.

ANALYSIS OF IMPACTS

ENVIRONMENTAL CHECKLIST	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
GEOLOGY – Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:		X		
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?		X		
iii) Seismic-related ground failure, including liquefaction?		X		
iv) Landslides?				X
b) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		
c) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		
MINERAL RESOURCES – Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
PALEONTOLOGIC RESOURCES – Would the project:				
a) Directly or indirectly destroy a unique paleontologic resource or site or unique geologic feature?		X		

DISCUSSION OF IMPACTS

GEOLOGY

A. Expose People or Structures to Potential Substantial Adverse .

I. Rupture of Known Earthquake Faults

The proposed power plant expansion and related linear facilities are not located on a fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist.

II. Strong Seismic Ground Shaking

The Applicant has acknowledged that maps prepared by Mualchin and Jones (1992) and Petersen et. al. (1996) suggest that there is a 10 percent probability that the peak bedrock accelerations beneath the site will exceed 0.5g in 50 years. The peak ground acceleration associated with this event could be amplified by the nature of the young Bay mud underlying the project site.

Design and construction of the project to conform to the California Building Code (1998) requirements outlined in **Conditions of Certification Geo-1 and Geo-2** and the standards adopted by the City of Hayward Public Works Department will reduce the impact of strong seismic ground shaking to less than significant. Section 1629.3.1 of Chapter 16 of the CBC specifically states that soil conditions that include soils vulnerable to potential failure or collapse under seismic loading (such as liquefiable soils, quick clays, or very high plasticity clays) require a site specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer to determine adequate design parameters.

III. Seismic Related Ground Failure, Including Liquefaction

Liquefaction is a condition in which a cohesionless soil loses its shear strength due to a sudden increase in pore water pressure that accompanies strong ground shaking. The soils most prone to liquefaction during earthquakes are fine-grained, poorly graded, saturated sands and silts. The applicant has acknowledged that liquefiable soils may be present beneath the project site. This conclusion is supported by the findings of a geotechnical investigation at the City of Hayward's Wastewater Treatment Plant (Judd Hill and Associates, 1979).

Design and construction of the project to conform to the guidance provided by CDMG (1997) and SCEC (1999) and the requirements of the California Building Code (1998), as outlined in **Conditions of Certification Geo-1 and Geo-2**, will reduce the impacts to less than significant. The California Building Code requires that a Certified Engineering Geologist or Geotechnical Engineer conduct a geotechnical investigation to evaluate the liquefaction potential and develop design recommendations.

IV. Landslides

Since the proposed power plant is located on a broad, gently sloping bayshore plain, the potential for landslides or other slope failures at the proposed power plant site is considered to be low.

B. Be Located on a Geologic Unit or Soil that is Unstable

Design and construction of the project to conform to the California Building Code (1998) requirements outlined in **Conditions of Certification Geo-1 and Geo-2** and the standards adopted by the City of Hayward Public Works Department will reduce the impacts to less than significant.

C. Be Located on an Expansive Soil

The site may be subject to expansive soil conditions (i.e. soils that swell when saturated), which are often associated to organic-rich or very plastic clays similar to those present near the surface of this site. Expansive soils may result in the buckling of lightly loaded foundations. Design and construction of the project to conform to the California Building Code (1998) requirements outlined in **Conditions of Certification Geo-1 and Geo-2** and the City of Hayward Public Works Department requirements for facilities design will reduce the impacts to less than significant.

MINERAL RESOURCES

A. Result in the Loss of Availability of a Known Mineral Resource

Salt produced by the evaporation of seawater from salt ponds immediately adjacent to the Bay is the only known mineral resource in the vicinity of the RCEC project site. Construction of the RCEC would not affect "harvesting" of this mineral resource. Construction of the project and its linear facilities would disturb shallow soils, and perhaps limit their use as mineral resources. However, the soils are predominately organic clays, so their value as a possible source of aggregate or as firing clays is low. Thus, CEC staff concludes that no special Conditions of Certification are required for mineral resources.

B. Result in the Loss of Availability of a Locally Important Mineral Resource

The site is not delineated as an important mineral resource recovery area in any local land use plan.

PALEONTOLOGY

A. Directly or Indirectly Destroy a Unique Paleontologic Resource

Vertebrate fossils have not been identified in the immediate project area, but vertebrate fossil discoveries have been reported elsewhere on the East Bay plain. Based on this fact, the Applicant has recognized that the project area should be considered as potentially sensitive for paleontologic resources.

The Applicant has proposed paleontologic monitoring and salvaging as mitigation to reduce the potential impacts to paleontologic resources. CEC staff concurs with this approach and has incorporated a requirement for a paleontologic monitoring program in the seven **Conditions of Certification (PALEO-1 through PALEO-7)** in this staff assessment. Should any unique paleontologic resources be encountered during construction, implementation of the monitoring and mitigation measures required by the **Conditions of Certification** will reduce the impacts to less than significant.

CUMULATIVE IMPACTS

If the Russell City Energy Center is constructed according to the proposed **Conditions of Certification**, it will have little or no impact on paleontologic and geologic resources. Therefore, it is staff's opinion that the project is unlikely to contribute to any significant adverse cumulative impacts on geologic or paleontologic resources.

COMPLIANCE WITH LORS

The applicant will likely be able to comply with applicable LORS.

FACILITY CLOSURE

Facility closure activities are not anticipated to impact geologic or paleontologic resources, since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

On August 5, 2001, Energy Commission staff received copy of an e-mail from Mr. Alex Ameri, Deputy Director of Public Works of the City of Hayward. Attached to that e-mail was a letter stating that the City of Hayward had concerns regarding geologic and seismic issues. Specifically, the letter informed staff that the project would need to be constructed following the City's seismic design standards. Staff contacted Mr. Ameri, and on August 10, 2001, Energy Commission staff received a fax with selected chapters from the Seismic Retrofit Study for City of Hayward Utility Structures (Dames and Moore, 1995). This document disclosed that the City of Hayward's Water Pollution Control Facility (WPCF), which is adjacent to the proposed site for the Russell City Energy Center, has been recognized as a site subject to high liquefaction hazards. California Energy Commission CEC staff met with Mr. Dennis Butler, Director of Public Works, on August 20, 2001. Mr. Butler stated that since the Applicant will deed the Advanced Water Treatment Unit to the City, his Department will require this facility to be designed to the standard-of-practice level of the Dames & Moore (1995) report. All utilities owned by the City have to meet the Dames & Moore (1995) design criteria. Mr. Butler also stated that the City has requested to be the Chief Building Officer of the project, and that if the CEC grants this request then oversight would be through the Department of Community and Economic Development. Mr. Butler explained that the Department of Community and Economic Development uses the CBC to determine the design level of privately-owned structures.

CONCLUSIONS AND RECOMENDATIONS

The Applicant proposes to mitigate impacts due to seismic hazards by complying with the requirements and design standards of the CBC (1998). No mitigation measures appear necessary to mitigate impact to geologic resources. The Applicant proposes to mitigate potential impacts to paleontologic resources by construction monitoring by a Paleontologic Resources Specialist, and salvaging of any identified fossils. The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geologic and paleontologic resources if it complies with applicable LORS and **Conditions of Certification** for geological hazards and geologic and paleontologic resources.

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 a 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), resume(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 shall notify the Project Owner of its findings within 15 days of receipt of the submittal. If the Engineering Geologist(s) is subsequently replaced, the Project Owner shall submit for approval the name(s), resume(s) and license number(s) of the newly assigned Engineering Geologist(s) to the CPM. The CPM will notify the Project Owner of its findings within 15 days of receipt of the notice of personnel change.

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, which shall include a site-specific seismic hazards analysis. 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 Geologic Report.

   Protocol: I: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and

recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Geologic 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 his/her area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of Chapter 33.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO or other, 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 Geologic Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO, with a copy of the transmittal letter forwarded to the CPM.

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 Paleontologic Resource Specialist approved by the CPM is available for field activities and prepared to implement the Conditions of Certification.

The designated Paleontologic Resource Specialist shall be responsible for implementing all the paleontologic 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 Paleontologic Resource Specialist.

The statement of qualifications for the designated Paleontologic Resources Specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontologic resource management; and at least three years of paleontologic resource mitigation and field experience in California, including at least one year's experience leading paleontologic 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 Paleontologic Resource Specialist do not satisfy the above requirements, the Project Owner shall submit another individual's name and qualifications for consideration.

Verification: At least 90 days prior to the start of construction (or a lesser number of days mutually agreed to by the Project Owner and the CPM), the Project Owner shall submit the name and resume and the availability for its designated Paleontologic 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 10 days prior to the termination or release of a designated Paleontologic 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 Paleontologic 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 Paleontologic Resource Specialist shall prepare a Paleontologic Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontologic resources, and submit this plan to the CPM for review and approval. After CPM approval, the Project Owner's designated Paleontologic Resource Specialist shall be available to implement the PRMMP, 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 PRMMP 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 Paleontologic 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 paleontologic resources.

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 60 days prior to the start of construction on the project (or a lesser number of days mutually agreed to by the Project Owner and the CPM), the Project Owner shall provide the CPM with a copy of the Monitoring and Mitigation plan prepared by the designated Paleontologic Resource Specialist for review and approval. If the plan is not approved, the Project Owner, the designated Paleontologic 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 Paleontologic 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 paleontologic resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontologic training program shall discuss the potential to encounter paleontologic 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 paleontologic resources are encountered during project activities. The training program shall be presented by the designated Paleontologic 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 days prior to the start of project construction, the Project Owner shall submit to the CPM for review, comment, and approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontologic resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the Project Owner, the designated Paleontologic 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.

PAL-4 The designated Paleontologic Resource Specialist or designee 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 Paleontologic 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 paleontologic activities conducted by the designated Paleontologic Resource Specialist.

PAL-5 The Project Owner, through the designated Paleontologic Resource Specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontologic 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 Paleontologic 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 paleontologic 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 Paleontologic Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The Project Owner shall ensure preparation of a Paleontologic Resources Report by the designated Paleontologic Resource Specialist. The Paleontologic Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The Project Owner shall submit the paleontologic 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 paleontologic resources encountered; determinations of sensitivity and significance; and a statement by the Paleontologic Resource Specialist that project impacts to paleontologic resources have been mitigated.

Verification: The Project Owner shall submit a copy of the Paleontologic 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 Paleontologic 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 potential impact to paleontologic resources by the closure activities. 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 paleontologic resources, then no mitigation measures for paleontologic resource management are required in the facility closure plan.

Protocol: Protocol: The closure requirements for paleontologic resources are to be based upon the Paleontologic 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.

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POWER PLANT EFFICIENCY

Testimony of Shahab Khoshmashrab

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Russell City Energy Center (RCEC) 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 RCEC'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 the 600 MW (nominal gross output) combined cycle merchant RCEC power plant to generate baseload and load following power, selling energy to the power market (Calpine/Bechtel 2001a, AFC §§ 1.1, 1.1.1, 1.4, 2.2.16, 2.2.18.1, 9.1, 9.2, 10.2.2, 10.3). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.) The RCEC will consist of two Siemens Westinghouse 501FD Phase 2 combustion turbine generators with inlet air fogging systems and steam injection producing approximately 200 MW each, two multi-pressure heat recovery steam generators (HRSGs) with duct burners, and one single 3-pressure, reheat, condensing steam turbine generator producing a maximum of 235 MW, arranged in a two-on-one combined cycle train, totaling approximately 600 MW. The gas turbines and HRSGs will be equipped with dry low-NOx combustors and selective catalytic reduction to control air emissions (Calpine/Bechtel 2001a, AFC §§ 1.1.1, 2.2.2, 2.2.4.1, 2.2.4.2, 2.2.4.3, 2.2.8, 9.6.1, 9.6.3, 9.6.4, 9.6.5, 9.6.6). Natural Gas will be delivered by the existing Pacific Gas & Electric (PG&E) gas distribution line 153 via a 0.9 mile natural gas pipeline (Calpine/Bechtel 2001a, AFC §§ 1.1.1, 1.3.4, 2.2.18.3, 9.6.2, 10.2.1). Power from the RCEC will be transmitted to the existing PG&E Eastshore Substation via PG&E's existing Eastshore to Grant 115-kv transmission corridor which is located approximately 600 feet from the northeast corner of the project site (Calpine/Bechtel 2001a, AFC §§ 1.1.1, 1.3.4, 2.1).

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 RCEC will burn natural gas at a nominal rate of 89 billion Btu per day LHV (Calpine/Bechtel 2001a, AFC § 2.2.6). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, electricity will be generated at a full load efficiency of approximately 55.3 percent LHV (Calpine/Bechtel 2001a, AFC Figure 2.2-3b; § 10.3); 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

The applicant has described its sources of supply of natural gas for the project (Calpine/Bechtel 2001a, AFC §§ 1.1.1, 1.3.4, 2.2.18.3, 5.1, 9.6.2, 10.2.1). Natural gas for the RCEC will be supplied from the existing PG&E system via PG&E's line 153, about 1.1 miles east of the RCEC site. Line 153 is capable of delivering the required quantity of gas to the RCEC. Furthermore, the PG&E gas supply infrastructure is extensive, offering access to vast reserves of gas. This source represents far more gas than would be required for a project this size. It is therefore highly unlikely that the project could pose a substantial increase in demand for natural gas in California.

Additional Energy Supply Requirements

Natural gas fuel will be supplied to the project by PG&E's existing line 153 via a 16-inch diameter pipeline (Calpine/Bechtel 2001a, AFC §§ 1.1.1, 1.3.4, 2.2.18.3, 5.1, 9.6.2, 10.2.1). PG&E claims that this line should provide adequate access to natural gas fuel. There is no real likelihood that the RCEC will require the development of additional energy supply capacity.

Compliance With Energy Standards

No standards apply to the efficiency of the RCEC or other non-cogeneration projects.

Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption

The RCEC 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 RCEC will be configured as a 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 (Calpine/Bechtel 2001a, AFC §§ 1.1, 1.1.1, 2.2.2, 9.6). 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.

Calpine/Bechtel proposes to use inlet air coolers, steam injection power augmentation capability, HRSG duct burners (re-heaters), three-pressure HRSG and steam turbine units and circulating water system (Calpine/Bechtel 2001a, AFC §§ 2.2.2, 2.2.3, 2.2.4). Staff believes these features contribute to meaningful efficiency enhancement to the RCEC. The two-train CT/HRSG configuration also allows for high efficiency during unit turndown because one CT can be shut down, leaving one fully loaded, efficiently operating CT instead of having two CTs operating at an inefficient 50 percent load.

The RCEC includes HRSG duct burners, partially to replace heat to the ST cycle during high ambient temperatures when CT capacity drops, and partially as added power. Duct firing also provides a number of operational benefits, such as load following and balancing and optimizing the operation of the ST cycle.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. Currently available, large combustion turbine models can be grouped into three categories including conventional, advanced and next generation. Advanced combustion turbines offer significant advantages for the RCEC. Their higher firing temperatures offer higher efficiencies than conventional turbines. They offer proven technology with numerous installations and extensive run time in commercial operation. Emission levels are also proven, and guaranteed emission levels have been reduced based on operational experience and design optimization by the manufacturers. In comparison, environmental performance and thermal efficiencies of next generation turbines have not been demonstrated in commercial operation (Calpine/Bechtel 2001a, AFC § 9.6.3). Therefore, the RCEC will employ the advanced model turbines instead of the conventional or the next generation models. The F-class gas turbines to be employed in the RCEC represent some of the most modern and efficient such machines now available. The applicant will employ two large advanced model Siemens Westinghouse 501FD (W501FD) Phase 2 gas turbine generators in a two-on-one combined cycle power train (Calpine/Bechtel 2001a, AFC §§ 1.1.1, 2.2.2, 2.2.4, 9.6.1, 9.6.3). This configuration is nominally rated at 550 MW and 55.8 percent efficiency LHV at ISO conditions (GTW 2000).

One possible alternative machine is the Alstom Power ABB KA24, a gas turbine nominally rated at 260 MW with a slightly higher efficiency rated at 56.5 percent LHV at ISO conditions (GTW 2000).

Another alternative is the General Electric GE 7FA, nominally rated at 530 MW and 56.5 percent efficiency LHV (GTW 2000). Except for the very slight increase in efficiency, this machine is functionally equivalent to the Siemens Westinghouse 501FD.

Any differences among the GE 7FA, ABB KA24, and W501FD in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, commercial availability, and ability to meet air pollution limitations. 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 260 MW. The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage.

Efficiency Of Alternatives To The Project

The project objectives include generating efficient energy for California's electricity market and locating the generating station near the center of demand for maximum efficiency and system benefit (Calpine/Bechtel 2001a, AFC §§ 9.1). RCEC proposes to accomplish these objectives by employing the most efficient technologies available today that are feasible for the project and by locating the generating center near the center of demand (San Francisco Peninsula). The primary reasons for choosing the

proposed technologies to be employed in the RCEC in lieu of the alternatives include higher efficiency, commercial availability, ability to reduce air emissions, desirable generating capacity and cost. Staff believes that combined cycle technology utilizing F-class CTGs, dry low NOx combustors and SCR, inlet air fogging system, and water cooled condenser are the most efficient technologies for large power plants wishing to compete in the power market (Calpine/Bechtel 2001a, AFC §§ 9.6.3, 9.6.4, 9.6.5, 9.6.6).

Alternative Generating Technologies

Alternative generating technologies for the RCEC are considered in the AFC (Calpine/Bechtel 2001a, AFC §§ 9.6.1, 9.6.2). Conventional boiler and steam turbine, simple cycle combustion turbine, conventional combined cycle, Kalina combined cycle, advanced combustion turbines, natural gas, coal, oil, solar, wind, hydroelectric, biomass, and geothermal technologies are all considered. One of the project's stated objectives is to generate efficient energy near the center of demand (Calpine/Bechtel 2001a, AFC §§ 9.1). Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel-efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is a G-class machine, such as the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding slightly greater efficiency. The 501G is still relatively new; the first such machine only recently began operation at a site in Florida owned by Lakeland Electric and Water, and at PG&E Generating's Millennium project in Charlton, Massachusetts (Power 1999). Given the minor efficiency improvement promised by the G-class turbine and the lack of a proven track record for the 501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class gas turbine is an H-class machine with a claimed fuel efficiency of 60 percent LHV at ISO conditions (GTW 1999b). This high efficiency is achieved through a higher pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. This first

Frame 7H application is not expected to enter service until the end of 2002. Given the lack of proven performance staff agrees with the applicant's decision to employ F-class machines.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ inlet air fogging (Calpine/Bechtel 2001a, AFC §§ 2.2.4.2, 9.6.5). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment (F-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the RCEC. Since natural gas will be burned by the power plants that are most competitive on the spot market, the most efficient plants will run the most. The high efficiency of the proposed RCEC should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants in the market, and therefore not impacting or even reducing the cumulative amount of natural gas consumed for power generation.

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 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

The project, if constructed and operated as proposed, would generate a nominal 600 MW of electric power at an overall project fuel efficiency around 55.3 percent LHV. 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 project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.
No Conditions of Certification are proposed.

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POWER PLANT RELIABILITY

Testimony of Shahab Khoshmashrab

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability of the project to determine if the power plant is likely to be built in accordance with typical industry norms. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Calpine/Bechtel Joint Development (Calpine/Bechtel) has predicted a 92 to 98 percent availability for the Russell City Energy Center (RCEC) (see below), staff uses the benchmark identified above, rather than Calpine/Bechtel's projection, to evaluate the project's reliability.

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 (see **Setting** below).

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), an entity that purchases, dispatches and sells electric power throughout the state. How Cal-ISO will ensure system reliability is still being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms being employed to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

Calpine/Bechtel proposes to operate the 600 MW (nominal output) Russell City Energy Center (RCEC), selling energy and capacity to the power market (Calpine/Bechtel 2001a, AFC §§ 1.4, 2.1, 2.2.2, 2.2.16, 2.2.18.1, 2.3.3, 10.2.2). The project is expected to operate at an overall availability in the range of 92 to 98 percent (Calpine/Bechtel 2001a, AFC § 10.2.2), and at a capacity factor, over the life of the plant, of 50 to 100 percent of base load (Calpine/Bechtel 2001a, AFC § 10.2.2).

ANALYSIS

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (Calpine/Bechtel 2001a,

AFC § 10.2.2), the RCEC will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the RCEC will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/ quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

Calpine/Bechtel describes a QA/QC program (Calpine/Bechtel 2001a, AFC §§ 2.2.18.5, 2.3.3.4) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

Calpine/Bechtel plans to provide appropriate redundancy of function for the combined cycle portion of the project (Calpine/Bechtel 2001a, AFC §§ 1.1, 2.1, 2.2.5, 2.2.13.3, 2.2.18.2, 2.3.3.2). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers and inverters. Other balance of plant equipment will be provided with redundant examples, thus:

- Two 100 percent HRSG feed water pumps per HRSG (Calpine/Bechtel. 2001 b);
- three 50 percent condensate pumps;
- two 60 percent water cooling system pumps;

- three 50 percent demineralized water systems with redundant installed pumps; and
- two 100 percent fuel gas compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

Maintenance Program

Calpine/Bechtel proposes to establish a plant maintenance program typical of the industry (Calpine/Bechtel 2001a, AFC §§ 2.2.18.1, 2.2.18.5, 10.2.2). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The RCEC will burn natural gas from the Pacific Gas and Electric Company (PG&E) system. Gas will be transmitted to the plant, via a new 16 inch diameter pipeline connection to the PG&E's line 153 (Calpine/Bechtel 2001a, AFC §§ 1.1.1,1.1.2, 2.2.6, 2.2.18.3, 5.1, 10.2.1). This PG&E natural gas system represents a resource of considerable capacity. This system offers access to adequate supplies of gas (Calpine/Bechtel 2001a, AFC § 2.2.18.3). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The RCEC will obtain water from a proposed new Advanced Water Treatment plant (AWT) immediately west of the energy center for plant cooling and process makeup needs. This water is supplied to the AWT via secondary effluent from the City of Hayward's Water Pollution Control Facility (WPCF) (Calpine/Bechtel 2001a, AFC §§ 1.1, 1.1.2, 1.5.2, 2.1, 2.2.7, 2.2.8, 2.2.18.4, 2.3.1.2, 7.1, 7.2, 9.4.15, 10.2.2). Potable water for domestic and fire water supply to the project will be provided by the City of Hayward's domestic water supply. The AWT will include a backup storage tank, sized to makeup supply to the RCEC in the event that supply from the WPCF is interrupted. Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see that portion of this document entitled **Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation.

Flooding

The site is essentially flat with an average elevation of 14 feet above mean sea level. Combined with a proper grading and drainage plan, there should be no credible threat of flooding (Calpine/Bechtel 2001a, AFC §§ 2.3.2.1, 2.2.17.1, 7.3, 8.15.1.2, 8.15.3 Figure 8.15-3). For further discussion, see that portion of this document entitled **Soil and Water Resources**.

Seismic Shaking

The site lies within Seismic Zone 4 (Calpine/Bechtel 2001a, AFC §§ 2.2.17.1, 2.3.2.1, 8.4, 9.4.5, 9.4.9, Figure 8.15-3); see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (Calpine/Bechtel 2001a, AFC Table 8.4-3, Appendix 10-B). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

For Combined Cycle units (All MW sizes)
Availability Factor = 91.49 percent

The gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor in the 92 to 98 percent range (Calpine/Bechtel 2001a, AFC § 2.2.2) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will

consist of 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. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact power plant 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 AND RECOMMENDATIONS

Calpine/Bechtel predicts an equivalent availability factor in the 92 to 98 percent range, which staff believes is achievable in light of the industry norm of 91.5 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

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TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha, P.E. and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's Decision. The Final Staff Assessment (FSA) 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 and assesses whether or not the applicant has accurately identified all interconnection facilities required for addition of the project to the electric grid.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant. Staff's analysis provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

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 the proposed project conforms to those standards. The Cal-ISO will provide testimony at the Energy Commission hearings.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (California Code of Regulations, title 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid and also beyond the project's interconnection with the existing transmission system that are required or are a reasonably foreseeable consequence of the power plant addition to the California transmission system. The interconnection of the project may result in the need to upgrade the capacity of the East Shore-San Mateo 230 kV lines by reconductoring the lines with a higher capacity conductor. This reconductoring project is a reasonably foreseeable separate project that may result from the generation project. The reconductoring of the transmission line will be separately licensed by the CPUC, with PG&E as the applicant, and will be subject to a separate environmental review. However, to inform the Commission of all potential environmental impacts related to the RCEC project, including foreseeable subsequent projects, Staff has evaluated the environmental effects of construction and operation of RCEC and is provided in Appendix A.

Calpine Corporation (Calpine) and Bechtel Enterprises Holdings (Bechtel), Inc. (applicant) filed an Application of Certification to the California Energy Commission to construct a nominal 600 megawatt (MW) natural gas-fired combined cycle generating facility to be located in the City of Hayward. The applicant proposes to connect their project, Russell City Energy Center (RCEC), to the existing Pacific Gas and Electric

(PG&E) East Shore Substation. The project is expected to be on line in the second quarter of 2004 (CB 2001a, AFC Sections 1.1 & 2).

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.
- California Public Utilities Commission (CPUC) General Order 128(GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- North American Reliability Council (NERC)/Western Systems Coordinating Council (WSCC) Planning Standards merge the WSCC Planning Standards into the NERC Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. Certain aspects of the NERC/WSCC standards are either more stringent or more specific than the NERC standards. These standards allow to plan electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WSCC system is based to a large degree on Section I.A of the standards, "NERC and WSCC Planning Standards with Table I and WSCC Disturbance-Performance Table" and on Section I.D, "NERC and WSCC Standards for Voltage support and Reactive Power". These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) and to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines in a right of way and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WSCC 2001).
- NERC Planning Standards provides national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system.

The NERC planning standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Planning Standards are similar to WSCC Standards, certain aspects of the WSCC standards are either more stringent or more specific than the NERC standards for Transmission System Contingency Performance. The NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

- Cal-ISO Grid Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the Cal-ISO transmission grid facilities. The Cal-ISO Grid Planning Standards incorporate the WSCC and NERC Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC and the NERC Planning Standards for Transmission System Contingency Performance. However, the Cal-ISO Standards also provide some additional requirements that are not found in the WSCC or NERC Planning Standards. The Cal-ISO Standards apply to all participating transmission owners interconnecting to the Cal-ISO controlled grid. It also applies when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO (Cal-ISO 2002a).

EXISTING FACILITIES AND RELATED SYSTEMS

The existing facilities in the vicinity of the RCEC project area include the following PG&E facilities:

- East Shore 230/115 kV Substation:
- East Shore-Grant double circuit 115 kV line.
- East Shore-Dumbarton double circuit 115 kV line.
- East Shore-San Mateo #1 230 kV line.
- Pittsburg-San Mateo #2 230 kV line.

The applicant has proposed interconnection of the RCEC at the East Shore Substation, which is about a mile away from the project site and connects to a major double circuit 230 kV bulk power line which directly "feeds" the South Bay and Peninsula load areas. The RCEC would essentially serve the load centers of the San Francisco Bay area including the peninsula, supplement the local generation at Contra Costa and Pittsburg, and enhance the reliability of the electric grid.

PROJECT DESCRIPTION

SWITCHYARD AND INTERCONNECTION FACILITIES

The RCEC site will be located about 1.0-mile northwest of the PG&E East shore 230/115 kV Substation in the City of Hayward, Alameda County (CB 2001a, AFC Section 1.1), at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street. The RCEC will consist of two combustion turbine generators (CTG),

each with an output of approximately 190 MVA and one steam turbine generators (STG), with a maximum nominal output of 255 MVA, for a total maximum plant net output of 620 MW (CB 2001a, AFC, Sections 2 & 6). Each of the generating units will be connected to a dedicated 15/18/230 kV step-up transformer and the high voltage terminals of each transformer will be connected to the new RCEC 230 kV switchyard by overhead conductors.

RCEC Switchyard

The new RCEC 230 kV switchyard is proposed for a configuration of five-breaker 3000-ampere ring bus arrangement with five switch bays. Each breaker will have a 63 kiloampere (kA) interrupting capacity. High voltage terminals of each generating unit transformer will be connected by overhead conductors to a switch bay. The remaining two switch bays will used for the new double circuit 230 kV overhead interconnection lines to the East Shore 230 kV Substation. The applicant will build, own and operate the switchyard (PG&E 2001a, SIS).

Transmission Interconnection Facilities

The new RCEC 230 kV switchyard is proposed to be interconnected to the East Shore Substation by building a new about 5480 feet long double circuit 230 kV transmission line, each line or circuit with 2x1113 KCM AAC (All Aluminum Conductor). The line is proposed to be built by the applicant on tubular steel poles in the available right of way running adjacent and parallel to the East Shore-Grant 115 kV line. To accommodate terminations of the two interconnecting lines at the East Shore 230 kV Substation and insure reliability of the network, the existing three-breaker single bus will be converted to a two-bus (main and transfer buses) arrangement. The proposed modifications to be done by PG&E in the East shore Substation will consist of four switch bays, each bay with breaker and a half arrangement and with two outlets, for a total of twelve breakers. The existing Pittsburg-San Mateo 230 kV line #2 that now passes by the Substation will also be looped in and out the Substation. As a result, there would be two East Shore-RCEC 230 kV lines, two East Shore-San Mateo 230 kV lines and two East Shore-Pittsburg 230 kV lines terminating at the East Shore Substation. Two 230/115 kV transformers for 115 kV circuit lines will also remain connected to the Substation (CB 2001a, AFC Section 6; PG&E 2001a, SIS).

ANALYSIS AND IMPACTS

SYSTEM RELIABILITY

A System Impact Study (SIS) for connecting a new power plant to the existing power system grid is performed to determine the alternate and preferred interconnection facilities to the grid, downstream transmission system impacts and their mitigation measures in conformance with system performance levels as required in Utility reliability criteria, NERC planning standards, WSCC reliability criteria and Cal-ISO reliability criteria. The study determines both positive and negative impacts, and for the reliability criteria violation cases (for the negative impacts) determines the alternate and preferred additional transmission facilities or other mitigation measures. The study is conducted with and without the new generation project and its interconnection facilities by using the computer model base case for the year the generator project will come on-line. The study normally includes a Load Flow study, Transient Stability study, Post-

transient Load Flow study and Short Circuit study. The study is focused on thermal overloads, voltage deviations, system stability (excessive oscillations in the generators and transmission system, voltage collapse, loss of loads or cascading outages) and short circuit duties. The study must be conducted under the normal condition (N-0) of the system and also for all credible contingency/emergency conditions, which includes the loss of a single system element (N-1) such as a transmission line, transformer or a generator and the simultaneous loss of two system elements (N-2), such as two transmission lines or a transmission line and a generator. The study may also be conducted for credible simultaneous loss of multiple (more than two) system elements. In addition to the above analysis, the studies may be performed to verify whether sufficient active or reactive power margins are available in the area system or area sub-system to which the new generator project will be interconnected. The SIS is followed by supplemental studies conducted by the participating transmission owner with details provided in a Detailed Interconnection Facility Study (DIFS) or a Facility Cost Report (FCR).

Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities required for connecting a project to the grid are considered part of the project and are subject to the full Application for Certification review process.

Scope of System Impact Study (SIS)

The SIS was performed by PG&E, the transmission owner, for the proposed project. The study included a Power Flow Study, Short Circuit Study, and Dynamic Stability Analysis (PG&E 2001a, System Impact Study). The study modeled the proposed RCEC for a net output of 620 MW. The base cases included all approved PG&E projects, modeled major transmission system path flows, and the proposed queue generation projects before the on-line date of the RCEC. The detailed study assumptions have been described in the SIS. The Power Flow studies were conducted with and without the RCEC connected to the PG&E grid at the East Shore Substation using 2004 Summer Peak and 2004 Summer Partial-Peak base cases under normal (N-0), Cal-ISO Category B (N-1) and Category C (N-2) contingency conditions. The Power Flow study assessed the project's impact on thermal loading of the transmission lines and equipment. Dynamic stability studies were conducted with the RCEC using the 2004 Summer Peak base case to determine whether the RCEC would create instability in the system following certain selected outages. Short circuit studies were conducted with and without the RCEC to determine if the RCEC would result in overstressing existing Substation facilities.

Additionally, the Cal-ISO has also done some sensitivity studies using the same base cases as above and recently provided a written testimony to the Energy Commission (Cal-ISO 2002b, Testimony dated March 2002) explaining the adverse impacts of the RCEC project to the grid, the mitigation measures required to be implemented in the system. On completion of Facilities Study, the Cal-ISO will be able to provide final approval for the RCEC interconnection to the grid. The conclusions and conditions contained herein apply to the above study results and the Cal-ISO testimony submitted. The results of the analysis provide assessment of the overloads that violate reliability criteria under normal and contingency conditions of the system.

Power Flow Study Results

Based on the SIS results and Cal-ISO testimony, there are some adverse impacts under normal and emergency contingency conditions of the network due to interconnection of the RCEC as proposed. The SIS and Cal-ISO testimony have provided a summary of the overload violations under the required criteria (PG&E 2001a, SIS; Cal-ISO 2002b, Testimony).

Normal (N-0) Conditions

- The East Shore 230/115 kV transformer banks #1 & 2 were loaded to 104 percent of the re-rated 139 MVA normal rating under summer peak scenario and 100 percent of the normal rating under summer partial peak scenario.
- With the removal of United Golden Gate Power Phase II project (575 MW project) and application of the Cal-ISO planning standards for San Francisco greater bay area generation outage condition, the East Shore-San Mateo 230 kV lines #1 & 2 were loaded to 96 and 93 percent of their normal 433 MVA 4 feet/second wind rating under summer peak and summer partial peak scenarios respectively. However, further sensitivity studies with San Francisco generation to load ratios nearer to the operation nomogram limits, the above lines were loaded to 105 percent of the normal rating.

Contingency (N-1/Cal-Iso Category B) Conditions

- The East Shore 230/115 transformer bank #1 or bank #2 would be loaded to 134 percent of its re-rated 160 MVA emergency rating for outage of the other transformer bank. The transformer banks would also be loaded to 103 percent of 160 MVA emergency rating for the contingency of the East Shore-San Mateo 230 kV line # 1 or #2.
- The East Shore-San Mateo 230 kV line #1 (or #2) would be loaded to 146 percent and 142 percent of its emergency 481 MVA 4 feet/second wind rating for outage of the East Shore-San Mateo 230 kV line #2 (or #1) under summer peak scenario and summer partial-peak scenario respectively.

Contingency (N-2/Cal-Iso Category C) Conditions

- The East Shore-San Mateo 230 kV line #1 (or #2) would be loaded to 125 percent of its 481 MVA emergency rating for the contingency of the East Shore-San Mateo 230 kV line #2 (or #1) and the Pittsburg-East shore 230 kV line #2 (or #1).
- The East Shore-San Mateo 230 kV line #1 (or #2) would be loaded to 157 percent of its 481 MVA emergency rating for the contingency of the East Shore-San Mateo 230 kV line #2 (or #1) and the East Shore 230/115 transformer bank #1 (or #2).
- The East Shore-San Mateo 230 kV line #1 (or #2) would be loaded to 166 percent of its 481 MVA emergency rating for the contingency of the East Shore-San Mateo 230 kV line #2 (or #1) and the East Shore-Dumbarton 115 kV line.
- The East Shore-San Mateo 230 kV line #1 (or #2) would be marginally overloaded (less than 1 percent) for the contingency of the Pittsburg-San Ramon 230 kV line and the Pittsburg-Tassajara 230 kV line.

Mitigation Measures and Comments

The mitigation alternatives considered by PG&E and Cal-ISO to eliminate the overloads are described in Section 7.5 of the SIS and also in the Cal-ISO letter testimony (PG&E 2001a, SIS; Cal-ISO 2002b, Testimony). PG&E has stated that the applicant is responsible for mitigation of overloads caused due to the addition of the RCEC under normal (N-0) and emergency single contingency (N-1/Category B contingencies) system conditions. The applicant is not responsible to mitigate overloads caused by Category C outages by installing or upgrading transmission facilities.

To ensure full maximum output of 620 MW from the RCEC plant during all conditions studied, the following upgrades of the facilities will be required:

1. Replace the existing two 139 MVA 230/115 kV transformer banks at the East Shore Substation with two three-phase 420 MVA transformers.

2. Reconductor the existing 954 KCM ACSR (Aluminum Conductor Steel-Reinforced) of the 12.6 mile long East Shore-San Mateo 230 kV line #1 and #2 with 954 KCM SSAC (Steel-Supported Aluminum Conductor). The reconductoring of these lines will also eliminate the overloads on these lines for N-2 contingencies as stated above. Alternately, if reconductoring of the East Shore-San Mateo 230 kV lines is not accomplished, operational procedure will be necessary for curtailing the output of the RCEC plant by about 450 MW on a pre-contingency basis (The generation output must be lowered prior to an outage). A Special Protection System (SPS) as an alternative to an operational procedure or reconductoring options were found technically infeasible due to the magnitude of the overload under N-1 conditions and consequent degradation of the reliability of the system and staff concurs with the findings.

A Special Protection System will be required for the outage of both the East Shore-San Mateo 230 kV lines under an (N-2) regardless of the reconductoring decision.

Staff concurs with the mitigation measures in sequence as recommended above. However, staff notes that the operational procedure option to mitigate the overloads on the East Shore-San Mateo 230 kV lines will not provide the system the benefits of full power output from the RCEC plant during peak as well as off-peak hours. Such limitations in generation output would result in significant "stranded" generation. Additionally, while increases in capacity on the East Shore-San Mateo 230 kV lines are necessary to allow full output of the RCEC project, those same line capacity increases would also provide significant power transport capability between major generation near Pittsburg and Contra Costa to the South bay area[1], and the San Mateo Substation which feeds the peninsula. This increase in power transport capability would be available to serve the peninsula as well as the South bay area even when RCEC generation would not be dispatched.

[1] The "South Bay Area" includes the De Anza and San Jose PG&E load areas just south of the southern bay extreme.

Local System Benefits

Senate Bill §25523(h) provides that the Commission should make findings on the economic, reliability and environmental benefits of projects. In view of its unique location just adjacent to the Greater bay area, the RCEC would essentially serve the local load centers of the San Francisco South Bay area and also the peninsula, supplement the old local generating plants at Contra Costa, Pittsburgh and in the peninsula, and therefore, would bring more reliability to the local electric grid. While special studies have not been conducted, staff believes from experience that the RCEC project would reduce system losses, provide voltage support to the system and would be a significant generation unit in the South Bay area and close to the peninsula. System loss decreases would occur because the RCEC will meet the local area load demands and decrease the line flows importing power to the area. Such decrease will eventually have some economic and environmental benefits. The RCEC would also provide additional reactive power in the area and help to prevent voltage collapse in the area during any system catastrophe by providing dynamic voltage support.

Transient Stability Study Results

Dynamic Stability studies were conducted by PG&E using 2004 Summer Peak base case to determine if the RCEC would create any adverse impact on the stable operation of the transmission grid following selected Cal-ISO category B (N-1) & C (N-2) outages (PG&E 2001a, SIS). The results indicate there are no identified transient stability concerns on the transmission system following the selected disturbances, as outlined in the SIS and the Cal-ISO testimony, for integration of the RCEC. However, for several of the contingencies, 10-second bus frequency plots at some 230 kV and 115 kV buses did not show positive damping results. The Cal-ISO has, therefore, requested for 20-second stability simulation runs for the critical contingencies in the Facilities Study report (Cal-ISO 2001a, Letter of Preliminary approval).

Short Circuit Study Results and Mitigation

The Short Circuit study performed by PG&E evaluated the impact of the RCEC on the fault duties of the PG&E facilities (PG&E 2001a, SIS) with and without the RCEC. The study indicates that there is no identified impact due to the addition of the RCEC project.

Cal-ISO Review

Based on the SIS results, the Cal-ISO has provided preliminary interconnection approval to the RCEC project (Cal-ISO 2001a, Letter of Preliminary approval). The Cal-ISO has also provided the written testimony to the Energy Commission as required on the Systems Impact Study (Cal-ISO 2002b, Testimony). Upon satisfactory completion of the Facilities study, the Cal-ISO is prepared to grant final approval for interconnection of the project to the Cal-ISO grid. The Cal-ISO final Interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. The Cal-ISO will provide testimony in the Energy Commission's hearing on the SIS and on any supplementary studies, and will provide conclusions and recommendations.

New Transmission Line and System Modifications

Besides the interconnection transmission facilities and switchyard as proposed by the applicant as discussed above, accommodating the power output of the EAEC will not require any other new transmission facilities based on present studies.

System modifications include replacing the existing East Shore 230/115 banks #1 & 2 with 420 MVA transformers and reconductoring the East Shore-San Mateo 230 kV lines with 954 KCM SSAC (PG&E 2001a, SIS).

Cumulative Impacts

In view of the concentration of electrical generation and several new and proposed power plants in the greater San Francisco Bay area, staff believes that the RCEC will have some cumulative effects on the local 230 kV and lower voltage network. Staff has provided a discussion on the cumulative transmission impacts for this project in Appendix A attached to this document.

ALTERNATIVE TRANSMISSION LINE ROUTES

The applicant considered the following alternatives for interconnection of the RCEC:

1. Looping the Pittsburg-San Mateo 230 kV line #2 into the RCEC switchyard.
2. Looping the East Shore-San Mateo 230 kV line #1 into the RCEC switchyard.
3. Looping the East Shore-Grant double circuit 115 kV line into the RCEC switchyard.
4. A double circuit 230 kV overhead interconnection line from the RCEC switchyard to the East Shore Substation.

Alternatives 1 through 3 above were not chosen by the applicant for a variety of reasons; cost, right-of-way issues, environmental issues and other transmission capacity concerns. The applicant selected alternative 4 above (CB 2001a, Section 9) and staff considers it acceptable.

COMPLIANCE WITH LORS

The SIS complies with the NERC/WSCC, Cal-ISO and NERC planning Standards and reliability criteria. The proposed RCEC switchyard will be located within the fenced yard of the project site. The applicant will design, build and operate the proposed switchyard. The proposed interconnection overhead 230 kV lines will run parallel and be located with the right of way of the existing PG&E East Shore-Grant 115 kV line. The interconnection lines will be designed and built by the applicant. The proposed modifications to the East Shore Substation will be done by PG&E within the Substation fenced yard.
Staff concludes that assuming the Conditions of Certification are met, the project will meet the requirements and standards of all applicable LORS.

FACILITY CLOSURE

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 owner is required to provide a closure plan 12 months prior to closure, which 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 Transmission Owner (TO), in this case PG&E, to assure (as one example) that the TO's system will not be closed into the outlet thus energizing the project Substation. Alternatively, the owner may coordinate with the TO to maintain some power service via the outlet line to supply critical station service equipment or other loads.[2]

UNEXPECTED TEMPORARY CLOSURE

An 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 establishing 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 Energy Commission's Compliance Project Manager (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**).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments related to the TSE discipline have been referred to TSE staff for this case.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. After reviewing the PG&E systems impact study (SIS) and Cal-ISO testimony, staff believes that the RCEC will result in significant overloading of the transmission system during certain operational conditions. Based on the system configuration used in the SIS, there will be some overload reliability criteria violations for interconnection of the RCEC plant under normal and emergency conditions of the electrical grid. The current mitigation plans as recommended are appropriate, but at this stage are tentative and subject to identification of the recommended mitigation solutions for the overload violations in the Facilities Study being conducted by PG&E.

[2] These are examples, many more exist.

2. The Cal-ISO has reviewed the SIS and has issued a preliminary interconnection approval for the RCEC. The Cal-ISO has also submitted written testimony to the Energy Commission. Upon satisfactory completion of the Facilities Study, the Cal-ISO will be in a position to grant final approval for the RCEC interconnection. The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC/WSCC, NERC and Cal-ISO planning standards and reliability criteria.

3. Staff concurs with the Cal-ISO review and finds that to offset downstream overloads on the system for interconnection of the RCEC and to insure full output of the RCEC plant, it will be essential to increase the thermal capacity of both the East Shore-San Mateo 230 kV lines by reconductoring the lines with adequate higher capacity conductor.

4. The proposed RCEC switchyard and interconnection facilities to the PG&E electric grid by building a new double circuit 230 kV line to the East Shore Substation would be adequate and reliable. The applicant will design and build these facilities. The required modifications at the East Shore Substation for terminations of the interconnecting facilities and other work will be designed, built, owned and operated by PG&E. Staff considers these facilities acceptable. With implementation of the Conditions of Certifications recommended by staff, these facilities will comply with LORS.

5. The Cal-ISO will provide testimony at the Commission's hearing on the System Impact Study and any supplemental studies, and will provide conclusions and recommendations.

6. With reconductoring of the East Shore to San Mateo 230 kV lines which would provide adequate transmission capacity for the full output of the project, staff concludes that the Russel City project will significantly increase the reliability of that system and provide local system benefits to the San Francisco South Bay and Peninsula areas.

7. Staff has reviewed the SIS, the Cal-ISO's testimony, and the applicant's environmental assessment reconductoring study and have provided conclusions on the reconductoring issue in Appendix A of the FSA.

RECOMMENDATIONS

If the Commission approves the project, staff recommends the following Conditions of Certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION FOR TSE

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate

audits by Energy Commission staff, the project owner shall provide designated 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 construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard control building
Transmission Pole/Tower

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following 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 power plant structures and equipment supports; or D) a mechanical engineer (Business and Professions Code Sections 6704 et seq., require 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, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

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. 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. 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.
The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 The project owner shall keep the CBO informed regarding the status of engineering design 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 become a controlled document and shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM to be included in response to **TSE-3**. 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.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of 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. The following activities shall be reported in the Monthly Compliance Report:

a) receipt or delay of major electrical equipment;

b) testing or energization of major electrical equipment; and

c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, 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.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The substitution of Compliance Project Manager (CPM) and CBO approved "equivalent" equipment and equivalent Substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 and 128 (GO 128) or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", National Electric Safety Code (NEC) and related industry standards.

b) Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to comply with a short circuit analysis.

c) 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.

d) Termination facilities shall comply with applicable PG&E interconnection standards.

e) The project conductors shall be sized to accommodate the full output from the project.

f) The project owner shall provide:

1. The final Detailed Facility Study (DFS) or Facility Cost Report including a description of facility upgrades, operational mitigation measures, and/or Remedial Action Scheme (RAS) and/or Special Protection System (SPS) sequencing and timing if applicable,

2. Executed Facility Interconnection Agreement,

3. Verification of Cal-ISO Notice of Synchronization,

4. A letter stating that the mitigation measures or projects selected by PG&E for each criteria violation are acceptable.

Verification: At least 60 days prior to the start of construction of transmission facilities, the project owner shall submit to the CBO for approval:

a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[3] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

c) 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 **TSE-5** a) through f) above.

d) The Facilities Study and signed letter from the applicant stating that mitigation is acceptable shall be provided concurrently to the CPM and CBO. Substitution of equipment and Substation configurations shall be identified and justified by the project owner for CBO approval.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO 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 CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

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3 Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-7 The applicant shall provide the following Notice to the California Independent System Operator (Cal-ISO) prior to synchronizing the facility with the California Transmission system:

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

Verification: The applicant shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one (1) week prior to initial synchronization with the grid. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one (1) day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

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.

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Cal-ISO (California Independent System Operator). 2002a. Cal-ISO Grid Planning Standards, February 2002.

Cal-ISO (California Independent System Operator). 2002b. Cal-ISO Testimony by Lawrence Tobias, dated March 15, 2002.

CB (Calpine-Bechtal) 2001a, Application for Certification for the Russell City Energy Center (01-AFC-7). Submitted to the California Energy Commission May 22, 2001.

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DEFINITION OF TERMS

AAC	All Aluminum conductor.
ACSR	Aluminum Conductor Steel-Reinforced.
SSAC	Steel-Supported 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) that 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 that 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.

Tap A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

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.

TSE

Colored

Figure

5-5-20

ALTERNATIVES

Testimony of Suzanne Phinney

PURPOSE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to consider whether there are alternatives that could (1) feasibly attain the project's objectives, and (2) avoid or substantially lessen one or more of the significant effects of the project. If the Energy Commission identifies an alternative that meets these criteria, it does not have the authority to approve the alternative or require the applicant to move the proposed project to another location.

ALTERNATIVE ANALYSIS CRITERIA

The "Guidelines for Implementation of the California Environmental Quality Act" (CEQA), Title 14, California Code of Regulations Section 15126(d), provide direction for an alternatives analysis 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...". In addition, the analysis must address the "no project" alternative. (Cal. Code Regs., tit. 14, § 15126(d).)

The range of alternatives is governed by the "rule of reason" which requires consideration of only those alternatives necessary to permit informed decision-making and public participation. CEQA states that an environmental document does not have to consider an alternative of which the effect cannot be reasonably ascertained and of which the implementation is remote and speculative. (Cal. Code Regs., tit 14 § 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).

To prepare this alternative analysis, the staff used the methodology summarized below:

- Describe the basic objectives of the project.
- Identify any potential significant environmental impacts of the project.
- Identify and evaluate technology alternatives to the project, which would mitigate impacts.
- Identify and evaluate alternative locations or sites to determine whether the environmental impacts of the alternatives are the same, better, or worse than the proposed project.
- Evaluate the impacts of not constructing the project to determine whether the "no project" alternative is superior to the project as proposed.

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to determine the potential significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding significant impacts. This section presents staff's analysis of generation and siting alternatives, and the "no project" alternative [CEQA Guidelines, section 15112(d)(2)].

In considering location alternatives, staff determined a reasonable geographical area. Since alternatives must consider the underlying objectives of the proposed project, staff confined the geographic area for location alternatives to the East San Francisco Bay Area. These location alternatives are consistent with the applicant's project objectives and siting criteria: proximity to centers of electrical demand, cooling water (preferably treated wastewater), electrical transmission facilities, and natural gas; site zoned for industrial use or heavy industry; and site located greater than 1000 feet from human receptors.

Another area of alternatives is consideration of specific technologies that could reduce impacts of the RCEC project. For example, in the air quality technical area there are different types of equipment that can be deployed to mitigate air pollutant emissions. The in depth discussion of such technology alternatives are included in the technical area chapters of the Final Staff Assessment (FSA), where appropriate.

BASIC OBJECTIVES OF THE PROJECT

After studying the Applicant's Application for Certification (AFC), Energy Commission staff has determined RCEC project's objectives to be:

- To generate economic, reliable, and environmentally sound electrical energy and capacity to the San Francisco Bay Area in the newly deregulated power market.
- To locate near centers of demand and key infrastructure, such as transmission line interconnections, supplies of process water (preferably wastewater), and natural gas at competitive prices.

PROJECT DESCRIPTION AND SETTING

A description of the project and its setting is in the **Project Description** section of this FSA.

ALTERNATIVES TO THE PROJECT

CONSERVATION AND DEMAND-SIDE MANAGEMENT

Conservation and demand-side management (DSM) include a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably

expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that will address this issue is the Commission's California Energy Outlook. Thus, such alternatives are not included in this analysis.
Since 1975, the displaced peak demand from all of these efforts has been roughly the equivalent of eighteen 500-MW power plants. The annual impact of building and appliance standards has increased steadily, from 600 MW in 1980 to 5,400 MW in 2000, as more new buildings and homes around the U.S. are built under increasingly efficient standards. Savings from energy efficiency programs implemented by utilities and state agencies have also increased (from 750 to 3,300 MW). Recent demand reducing proposals from the Governor and Legislature have proven to have an impact by reducing consumption by an average of 3,500 MW during the summer of 2001 (CEC 2001a). In addition, voluntary conservation measures adopted by residential and commercial/industrial users in response to the recent energy situation led to a 7.5 percent drop in electricity use throughout the state as of August 2001, but that dropped to 1.5 percent in October 2001 (CEC 2001a). There was a 0.7 percent increase in energy used in February 2002 as compared to February 2001; the February 2002 usage still represented a 5.5 percent decrease in energy consumption as compared to February 2000 (CEC 2002).

The ability of conservation and DSM to reduce electricity use must be evaluated in the context of electricity use in the project area. From 1996 to 1999, nonresidential electricity use in the Bay Area grew by 10 percent. It is unlikely that conservation and energy efficiency programs will completely offset the energy demand growth in the San Francisco Bay Area.

GENERATION TECHNOLOGY ALTERNATIVES

Staff compared various alternative technologies, scaled to meet the project's objectives, with the proposed project. Technologies examined were those principal electricity generation technologies that do not burn fossil fuels such as natural gas: solar, wind and biomass. Both solar and wind generation result in the absence or reduction in air pollutant emissions, visible plumes, and need for emissions control. Water consumption for both wind and solar generation is substantially less than for a natural gas fired plant because there is no thermal cooling requirement.

However, solar and wind resources would require large land areas in order to generate 600 megawatts of electricity. Specifically, central receiver solar thermal projects require approximately 5 acres per megawatt; therefore 600 megawatts would require approximately 3,000 acres, or over 200 times the amount of land area taken by the proposed plant site and linear facilities. Parabolic trough solar thermal technology requires similar acreage per megawatt. Wind generation "farms" generally require about 17 acres per megawatt, with 600 megawatts requiring 10,200 acres, approximately 690 times the amount of space taken by the proposed plant site and linear facilities (CEC, 2001b). Additionally, solar and wind energy technologies cannot provide full-time availability due to the natural intermittent availability of the source.

Although air emissions are significantly reduced or eliminated for both wind and solar facilities, both can have significant visual effects. Wind facilities can also impact birds depending on the turbine technology.

For biomass generation a fuel source such as wood chips (the preferred source) or agricultural waste is necessary. Neither is available in large quantities in the general area of the RCEC plant. Biomass facilities also generate substantially greater quantities of air pollutant emissions. In addition, biomass plants are typically sized to generate less than 10 MW, which is substantially less than the capacity of the 600 MW RCEC project.

Because of the typically lower efficiencies and intermittent availability of alternative generation technologies, they do not fulfill a basic objective of this plant: to provide power from a baseload facility to meet the growing demands for reliable power in the San Francisco Bay Area. Consequently, staff does not believe that geothermal, hydroelectric, solar, wind and biomass technologies present feasible alternatives to the proposed project.

SITING ALTERNATIVES

The purpose of this section of the **Alternatives** chapter is to evaluate the siting alternatives provided by the Applicant and, if necessary, to propose other site possibilities. The evaluation criteria will be based on the answers to these questions: 1) Will the alternative fulfill the project objectives and siting criteria? 2) Will it resolve the issues (significant impacts) identified as problems with the current project proposal? 3) Will it cause other significant environmental impacts?

In compliance with CEQA, staff analyzed a reasonable range of alternatives to the proposed project. Staff examined five siting alternatives proposed by the Applicant: Alternative Sites A, B, C, D and E (RCEC 2001, Figure 9-1). The alternative sites are located in the general area of the proposed RCEC site and share some common attributes.

ALTERNATIVE SITE A

Alternative Site A is located off Central Ave in Newark, Alameda County, at the Cargill Corporation's salt processing complex. Sixteen acres would be available on what is currently the site of Cargill's cooling water pond. This presumes that Cargill would replace its cooling pond with a different kind of cooling system. This site would require a 3.5 mile pipeline for natural gas supply, a 2 mile tie-in to access transmission, and a 7 mile pipeline to access secondary treated water from the Alvarado Treatment Plant.

As compared to the proposed site, Alternative Site A would be less visible to recreational users and would reduce long-term biological impacts. However, the pipeline to the Alvarado Water Treatment Plant would cross several large wetland and marsh areas and could temporarily impact protected species. In addition, small

amounts of wetland vegetation ringing the cooling pond would be removed, although it is not clear it is a jurisdictional wetland since it is an artificially constructed pond that

does not communicate with adjacent drainage. Alternative Site A would also require approximately 10 miles more of linear connections as compared to the proposed RCEC site.

ALTERNATIVE SITE B

Alternative Site B is located in Fremont, Alameda County, near the southern boundary of Newark. The site is near the western end of Stephenson Road, which ends just past the site boundary. Railroad tracks run along the western edge of the site. The 55.62 acre undeveloped parcel is bisected by a PG&E 230-kV transmission line and is in visible range of PG&E's Newark Substation (located 0.5 miles to the south). Either an 8 mile (from the Santa Clara/San Jose WPCF) or 9 mile (from the Alvarado WPCF) pipeline to access process water would be required. Development of the site may be difficult due to an existing conservation easement on the site and the need to purchase mitigation land.

When compared to the RCEC site, Alternative Site B would be less visible since there are no recreational users nearby and the site already contains transmission towers. Alternative Site B could create additional biological impacts since construction of a pipeline to the Santa Clara/San Jose WPCF would temporarily disturb bay marshland and the habitat of several protected species. Also, Site B contains seasonal wetlands and is likely to be habitat for protected species, including the red-legged frog. In addition, the pipeline could encounter significant prehistoric remains. The site would require a zoning variance as the 145-foot-high HRSG stacks exceed the building height limit of 40 feet.

ALTERNATIVE SITE C

Alternative Site C is located on Boyce Road in Fremont, near Alternative Site B. Only about 10 acres of the 16-acre site are available for development, which may be too small for construction of a power plant to meet project objectives. The zoning at Site C restricts height to 40 feet, which would not be sufficient for the power plant. The eastern edge of the site is shown on FEMA 100-year flood plain maps. Pipeline distance to reclaimed water and potential effects would be the same as described for Alternative Site B. Natural gas is available 1.3 miles from the site and PG&E's Newark substation is 0.6 miles from the site. Total linear distances are approximately 10 to 11 miles. The site is located on a major thoroughfare and is 0.25 miles from the nearest residence.

As with the RCEC site, a power plant at Site C would still be visible to viewers due to the distance to residences, the viewing traffic along Boyce Road, and recreational users on the proposed Bay Trail route along Boyce Road. Long-term biological effects would be reduced since the open field on the site is periodically mowed and does not appear to contain quality habitat for species of concern. However, as with Alternative Site B, this site would result in temporary biological impacts from the construction of lengthy pipelines for cooling water, unless the connection was to the Milpitas water treatment plant. Sound baffling equipment would reduce any noise to receptors nearby Site C.

ALTERNATIVE SITE D

Alternative Site D is located on Depot Road in Hayward about 0.4 miles north of the RCEC project site and would occupy land currently occupied by various industrial uses. Although the area comprises 49 acres involving consolidation of up to 14 parcels with different ownership, it is unlikely that the full acreage would be required for a plant equivalent to the RCEC project. Linear distances would be 0.1 mile for transmission line connection, 0.1 mile to connect to the Hayward WPCF pipeline and 1 mile to a natural gas line for a total of 1.2 miles.

As compared to the RCEC project, Alternative Site D is developed and therefore would not cause biological impacts due to the developed nature of the site. A power plant at Alternative Site D would be less visible given the greater distance from State Route 92 and the Hayward Shoreline Interpretive Center. As with the RCEC site, traffic is already congested in the project area and would create similar impacts. Construction at this site would require removal of automobiles from the various salvage yards and remediation of petroleum hydrocarbon contamination.

ALTERNATIVE SITE E

Alternative Site E is located in Hayward near the west end of West Winton Avenue. The 22.8-acre site is comprised of 10 separate parcels, although ownership is limited to 2 owners. The site is 0.1 mile from a PG&E 115 kV transmission line (although as with Alternative Site D, a parallel 230-kv line would be required), 1.4 miles from the natural gas line and 1.5 miles from the Hayward WPCF, for a total of 3.0 linear miles. Alternative Site E is located 1.1 miles from the nearest residence.

Although Alternative Site E is located adjacent to a marsh restoration project, due to the industrialized nature of the site, biological impacts would be expected to be less when compared to the RCEC project. The site will be visible to commuters within the Hayward Industrial Corridor, to recreational viewers along the Bay Trail and to those driving directly by the site on route to the Hayward Shoreline Regional Park Trailhead at the end of West Winton Avenue. In comparison to the proposed project, a power plant at Alternative Site E would be less visible to Hayward Shoreline Interpretive Center visitors.

RELATED FACILITIES ALTERNATIVES

The following related facilities pertain only to those associated with the applicant's preferred power plant site.

TRANSMISSION LINES

A double circuit 230 kV line approximately 1.1 mile long will connect the RCEC project to the existing Eastshore Substation. Since the proposed line parallels an existing 115kV line located 600 feet from the site, there is no need to consider alternative routes.

WATER SUPPLY

The RCEC will use recycled water for steam production and cooling supplied by the City of Hayward's Water Pollution Control Facility (WPCF) located directly across Enterprise Drive from the RCEC. The source water is treated as secondary effluent at the WPCF, and will be treated to a tertiary level consistent with Title 22 regulations at RCEC's Advanced Water Treatment (AWT) Plant. Once constructed, the City of Hayward will own and operate the AWT Plant in coordination with its WPCF. An alternative supply of recycled water was considered for the RCEC consisting of Union Sanitary District's wastewater effluent. The RCEC achieves compliance with LORS by using recycled water. The City of Hayward source is preferable because coordination of both supplies to the RCEC, and effluent from RCEC with the City of Hayward's WPCF, is logistically simpler and the proximity of the City of Hayward facilities reduces potential impacts of longer linear facilities associated with alternative supplies.

WASTEWATER DISPOSAL

In the AFC, the project applicant stated that the preferred option for wastewater discharge was disposal at the City of Hayward's WPCF where the wastewater would be returned to its original source. A zero discharge alternative was considered but the disadvantages (increase in on-site chemical handling and storage and generation and disposal of sludge) were found to outweigh the water saving advantages.

NATURAL GAS SUPPLY PIPELINE

Natural gas for the RCEC project will be supplied by a 16-inch pipeline from a major gas distribution line (Line 153) that parallels the Union Pacific Railroad tracks about one mile east of the RCEC site. Several additional routes were evaluated with similar environmental characteristics. However, the proposed routing will have fewer impacts on traffic and is preferred by the City of Hayward because it offers less interference with existing underground infrastructure.

THE "NO PROJECT" ALTERNATIVE

CEQA Guidelines and Energy Commission regulations require consideration of the "no project" alternative. This alternative assumes that the project is not constructed, and the impacts of that scenario are compared to those of the proposed project. A determination is made whether the "no project" alternative is superior, equivalent, or inferior to the proposed project from an environmental impact perspective.

In the AFC, the applicant identifies several obstacles to the "no project" alternative. The "no project" alternatives would forego all the benefits associated with the RCEC project. It would result in increased energy production from existing power plants that would most likely consume more fuel and emit more air pollutants per kilowatt-hour generated. The "no project" alternative would not serve to insulate ratepayers or taxpayers from risk, but instead could harm ratepayers by decreasing competition and thereby increasing electricity prices" (RCEC 2001 pp 9-2.)

The RCEC project would be sited in an industrial setting although immediately to the south and west are marshlands, including the Hayward Area Recreation District marsh and a salt marsh harvest mouse preserve that is located further south, along State Route 92. There are no unmitigated significant impacts as a result of the proposed RCEC.

If the project is not built, the region will not benefit from the relatively clean and efficient source of 600 MW of new generation that this facility would provide. On the other hand, the market conditions that gave rise to this facility may presumably give rise to different but similar power plant generation proposals that would provide similar benefits. It is thus difficult to conclude that "no project" would have serious, long-term consequences on the cost or reliability of electricity in the region.

If other generation projects are built in the same region, they may or may not have impacts similar to that of the RCEC project. Such projects, should they be built, could lead to greater or lesser impacts than that of the current proposal, depending on the site chosen. It is thus impossible to relatively compare the impacts of the proposed project against those of another project at an undetermined site that would be triggered by the "no project" alternative.

The "no project" alternative would eliminate the expected economic benefits that the proposed project would bring to Alameda County, including increased property taxes, employment, sales taxes, and sales of services, manufactured goods, and equipment (see the **Socioeconomics** chapter).

CONCLUSIONS AND RECOMMENDATION

The five site alternatives considered in this section offer some advantages and disadvantages in comparison to the proposed project, but overall the proposed site has fewer impacts than alternative sites. Staff does not believe that alternative technologies (geothermal, solar, wind, biomass, and hydroelectric) present feasible alternatives to the proposed project. Therefore, no alternative is recommended over the proposed project.

REFERENCES

CEC (California Energy Commission). 2002. Internet Website at http://www.energy.ca.gov/electricity/peak_demand_reduction.html

CEC (California Energy Commission). 2001a. Internet Website at http://www.energy.ca.gov/electricity/peak_demand_reduction.html.

CEC (California Energy Commission). 2001b. Internet Website at http://www.energy.ca.gov/wind/overview.html.

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Jeri Zene Scott

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

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;
   - 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

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION:

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is therefore not considered construction.

Ground Disturbance:

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

Grading :

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

Construction:

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

a. The installation of environmental monitoring equipment.
b. A soil or geological investigation.
c. A topographical survey.
d. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility.
e. Any work to provide access to the site for any of the purposes specified in a., b., c., or d.

START OF COMMERCIAL OPERATION

a. The project startup team has completed work.
b. The plant manager accepts control from the construction manager.
c. Expenses for the project are switched from construction to operation.
d. The facility has reached steady state with reliability at the rated capacity.
e. Financing accounting switches from construction (capital costs) to operations (income-producing expenses) financing.

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. resolving complaints;

3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and,
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and,
4. 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. The post-certification changes do not include changes related to replacement of the simple-cycle power plant with a combined-cycle power plant pursuant to section 25552 of the Public Resources Code. All facility changes related to replacement of the power plant will be addressed through the review of an Application for Certification for the replacement combined-cycle power plant. 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:

1. 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;
2. appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or

4. Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
Russell City Energy Center Project (01-AFC-7)
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,

1. the condition number,
2. a brief description of the verification action or submittal required by the condition,
3. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
4. the expected or actual submittal date,
5. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable, and
6. the compliance status for each condition (e.g., "not started", "in progress" or "completed date").

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

Pre-Construction Matrix

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

Tasks Prior to Start of Construction

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Monthly Compliance Report

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM.

The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.
During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. 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;
2. 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;
3. 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);
4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. 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:

1. 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);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. 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;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file, and
9. 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].
10. 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 1,000 feet of the project site and 500 feet of the linear facilities 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. All recorded inquiries shall be responded to within 24 hours.
The telephone number shall be posted at the project site and easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at www.energy.ca.gov/sitingcases.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on the following page.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

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.

CONSTRUCTION MILESTONES

The following is the procedure for establishing and enforcing milestones, which include milestone dates for the pre-construction and construction phases of the project.

Milestones and a method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after project approval, the date of docketing. If this deadline is not met, the CPM will establish the milestones.

I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION WITHIN ONE YEAR OF CERTIFICATION

1. Obtain site control.
2. Obtain financing.
3. Mobilize site.
4. Begin rough grading for permanent structures (start of construction).

II. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION

1. Begin pouring major foundation concrete.
2. Begin installation of major equipment.
3. Complete installation of major equipment.
4. Begin gas pipeline construction.
5. Complete gas pipeline interconnection.
6. Begin T-line construction.
7. Complete T-line interconnection.
8. Begin commercial operation.

The CPM will negotiate the above-cited pre-construction and construction milestones with the project owner based on an expected schedule of construction. The CPM may agree to modify the final milestones from those listed above at any time prior to or during construction if the project owner demonstrates good-cause for not meeting the originally-established milestones. Otherwise, failure to meet milestone dates without a finding of good cause is considered cause for possible forfeiture of certification or other penalties.

III. A FINDING THAT THERE IS GOOD CAUSE FOR FAILURE TO MEET MILESTONES WILL BE MADE IF ANY OF THE FOLLOWING CRITERIA ARE MET:

1. The change in any milestone does not change the established commercial operation date milestone.

2. The milestone is changed due to circumstances beyond the project owner's control.
3. The milestone will be missed, but the project owner demonstrates a good-faith effort to meet the project milestone.
4. The milestone will be missed due to unforeseen natural disasters or acts of God which prevent timely completion of the milestones.
5. The milestone is missed due to requirements of the California ISO to maintain existing generation output.

If a milestone date cannot be met, the CPM will make a determination whether the project owner has demonstrated good cause for failure to meet the milestone. If the determination is that good cause exists, the CPM will negotiate revised milestones.

If the project owner fails to meet one or more of the established milestones, and the CPM determines that good cause does not exist, the CPM will make a recommendation to the Executive Director. Upon receiving such recommendation, the Executive Director will take one of the following actions.

1. Conclude that good cause exists and direct that revised milestones be established; or

2. Issue a reprimand, impose a fine, or take other appropriate remedial action and direct that revised milestones be established; or

3. Recommend, after consulting with the Siting Committee, that the Commission issue a finding that the project owner has forfeited the project's certification.

The project owner has the right to appeal a finding of no good cause, or any recommended remedial action to the full Commission.

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 that will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure shall 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

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

Unplanned 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 other emergency.

UNEXPECTED PERMANENT CLOSURE

Unplanned permanent closure occurs when the project owner closes the facility suddenly and/or unexpectedly on a permanent basis. This includes the scenario in which the owner remains accountable for implementing the on-site contingency plan as well as the scenario in which the project owner is unable to implement the contingency plan and the project is essentially abandoned.

PLANNED CLOSURE

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.
The plan shall:

1. 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.
2. dentify 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;
3. identify all facilities or equipment that will a) be immediately removed from the site after closure (e.g., hazardous materials); b) temporarily remain on the stie after closure (e.g., until the item is sold or scrapped): and c) permanently remain on site after closure. The plan must explain both why the item cannot be removed and why

it does not present a risk of harm to the environment and the public health and safety to remain *insitus* for an indefinite period; and

4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less 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 the circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

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. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforeseeable events, and other factors the Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

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:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;
3. 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,
4. 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

Pursuant to Title 20, California Code of Regulations, section 1770 (d), the staff may modify the verification provisions as necessary to enforce the conditions of certification without requesting an amendment to the decision.

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: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Rough Grading	
Start Construction	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Fuel Supply Line Construction	
COMPLETE FUEL SUPPLY LINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

APPENDIX A

RECONDUCTORING PROJECT IMPACT ANALYSIS

TABLE OF CONTENTS

1. INTRODUCTION 1

2. CONCEPTUAL DESIGN OF RECONDUCTORING 3

3. ANALYSIS OF RECONDUCTORING 9

3.1 BIOLOGICAL RESOURCES 9
3.2 CULTURAL RESOURCES 13
3.3 LAND USE 15
3.4 NOISE 16
3.5 TRAFFIC AND TRANSPORTATION 17
3.6 TRANSMISSION LINE SAFETY AND NUISANCE 18
3.7 VISUAL RESOURCES 19
3.8 SOIL AND WATER RESOURCES 21
3.9 TRANSMISSION SYSTEM ENGINEERING 23
3.10 GEOLOGY AND PALEONTOLOGY 24

4. CONCLUSION 26

5. REFERENCES 28

6. LIST OF CONTRIBUTERS 30

LIST OF FIGURES AND TABLES

Figures

Figure 1, East Shore to San Mateo 230kV Transmission Line Project Location 4

Tables

Table 1, Sensitive Species Near the East Shore-San Mateo Line 9

Table 2, Potential Impacts at Angle Towers and Substations 11

APPENDIX TO TRANSMISSION SYSTEM ENGINEERING RECONDUCTORING PROJECT IMPACT ANALYSIS

Testimony of Matt Trask

1 INTRODUCTION AND PURPOSE

Energy Commission Staff has prepared this appendix to the Transmission System Engineering section of the Final Staff Assessment for the Russell City Energy Center project in order to examine the potential indirect impacts of the project associated with future reconductoring of transmission lines. Reconductoring involves replacing the cables on one or more transmission line segments with new cables that, because of improvements in the metallurgy of the conductors, allow a large increase in the current-carrying capacity of the segment, without increasing the weight or size of the cable. Reconductoring also may involve modifying or even replacing one or more of the transmission line towers because the new conductors have different sag characteristics, which may require raising the height of certain towers.

Though the Applicant contends that reconductoring will not be necessary to meet its business goals for developing the RCEC, Staff's analysis of the potential effects on the transmission system caused by operation of the proposed facility shows that reconductoring of at least one major line in the Bay Area, the East Shore to San Mateo 230kV Transmission Line, is a reasonably foreseeable event. Because of this, and the requirement under the California Environmental Quality Act (CEQA) to examine foreseeable subsequent projects that result from the project, Staff has analyzed the potential impacts of reconductoring as it may pertain to the RCEC. Reconductoring will be a separate project with a different applicant before a different agency, and will be subject to that agency's CEQA analysis. A more general level of analysis is thus appropriate for this Staff Assessment.

The actual need for reconductoring will be finally determined after PG&E has completed the Final Design Study or Cost Study for the Generator Facility Interconnection Agreement for the Russell City Energy Center project. At that time, presuming reconductoring is actually needed, PG&E would apply to the California Public Utilities Commission (CPUC) for authority to implement the reconductoring project, and to recover the cost of the reconductoring from Calpine and/or PG&E ratepayers. As part of its application to the CPUC, PG&E would prepare a Proponent's Environmental Assessment (PEA), in which PG&E would discuss the design and construction procedures for the reconductoring project, examine potential impacts to the environmental and public health that would be caused by the reconductoring, and propose mitigation that would either eliminate, avoid, reduce to a less-than-significant level, or compensate for any identified impact. As part of the CPUC process, PG&E would be required to inform all adjacent property owners about the nature of the work that will occur.

The CPUC would use the PEA to focus quickly on any impacts of the project that may be of concern. If there is no possibility that the project may have a significant adverse environmental impact, the CPUC may find the project exempt from CEQA. Otherwise, the CPUC may use the PEA in preparing an Initial Study, which it would use to

determine whether to prepare a Negative Declaration or an Environmental Impact Report.

The purpose of the CEC's reconductoring analysis is to inform the Energy Commission, interested parties and the general public of the potential indirect environmental and public health effects caused by the approval of the RCEC project. This analysis examines the nature and scope of the probable impacts of reconductoring, should it occur, and measures for mitigating these impacts to a less-than-significant level.

The analysis is based upon information supplied by the Applicant, as well as on information gathered from PG&E and other sources. This analysis describes the process of reconductoring and the types of environmental impacts that might occur as a result of reconductoring. It also discusses specific aspects of the reconductoring project that Staff has determined would likely occur as a result of approval of the project, such as its location and some likely places for pull and tensioning sites, and staging yards.

Finally, this analysis draws conclusions as to the likelihood that the reconductoring could be accomplished with no significant environmental impacts, and identifies mitigation measures that could be enacted to ensure the reconductoring project would not cause significant impacts. Because the potential for impacts in several technical areas are essentially non-existent, several of the areas normally studied in a Staff Assessment have been eliminated from this analysis. These are: Air Quality, Facility Design, Hazardous Materials Management, Power Plant Efficiency, Power Plant Reliability, Worker Safety, Socioeconomic Resources, and Waste Management. Impacts to those areas, if any, would be similar but likely much less in severity to those related to construction of the project and its associated linear projects; and the construction-related analysis and proposed mitigation measures in those sections of the Staff Assessment for the Russell City Energy Center provides a general understanding of the potential impacts in those areas that could possibly, but not likely, be caused by a reconductoring project.

2 CONCEPTUAL DESIGN OF RECONDUCTORING

This Chapter identifies the specific transmission line segments that Staff believes will be reconductored as a result of licensing the project, and provides an overview review of the reconductoring process on a general level. It describes the basic work involved in reconductoring a transmission line segment, as well as specific designs (when known) for the reconductoring project that is a reasonably foreseeable result of the approval of the project.

2.1 DESCRIPTION OF THE PROPOSED PROJECT(S)

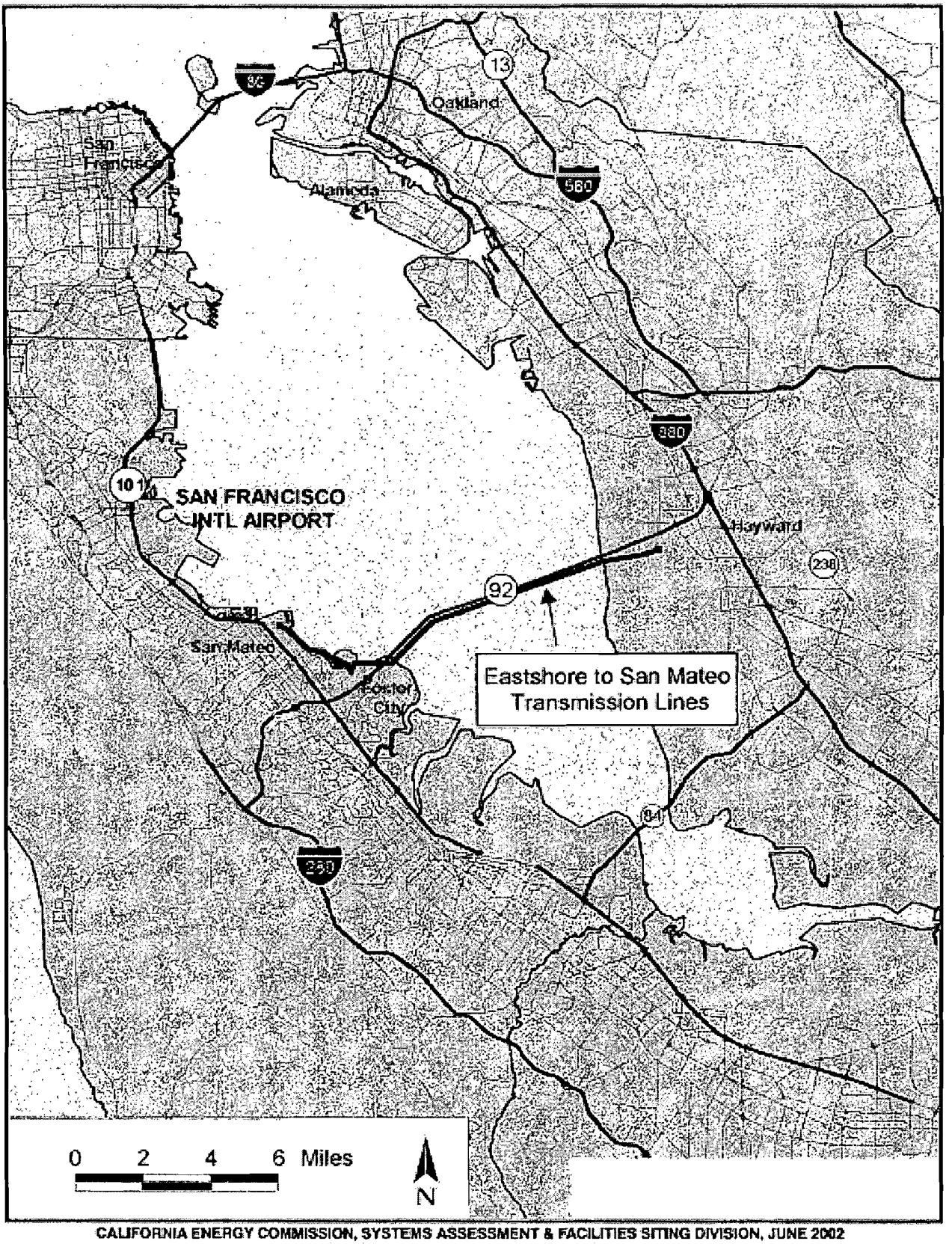
Energy Commission Staff have determined that construction and operation of the proposed RCEC would likely trigger the need to reconductor the East Shore to San Mateo 230 kV transmission lines (East Shore-San Mateo line). As shown in **APPENDIX A FIGURE 1**, these lines extend from the East Shore Substation in Hayward, Alameda County, California, westward and southwestward across the San Francisco Bay on a route paralleling the Hayward-San Mateo Bridge (State Route 92), and then turn to the northwest after reaching the western shore of the Bay, extending to the San Mateo

Substation in San Mateo, San Mateo County. The total length of the segment that may be reconductored is 12.52 miles.

The East Shore-San Mateo line segment consists of two circuits on a single set of lattice towers, for a total of six cables that would be replaced. Currently only one of these circuits terminates at the East Shore Substation. As part of the reconductoring program, the second line, which currently bypasses the substation, would be reconfigured to terminate at the East Shore Substation as well.

The East Shore-San Mateo line begins at the East Shore Substation, located in an open space area just southeast of the intersection of Investment Blvd. and Production Ave. in the Mount Eden neighborhood of the City of Hayward, and runs west through a business park for a short distance, before crossing abandoned salt evaporation ponds. These abandoned ponds are characterized by grasslands and wetlands, including several canals constructed to supply seawater to the abandoned salt-evaporation ponds. The line continues west over the abandoned ponds on the south side of the approach to the Hayward-San Mateo Bridge for 2 miles. The route then begins to travel over water parallel to the bridge, heading west and then southwest on towers mounted on concrete bases in the Bay for 7 miles, to the western footing of the bridge in Foster City. From there, the route turns west-northwest, crosses State Route 92 and extends through a commercial and industrial area. Along this portion of the route, the towers are located mostly in parking lots and paved storage yards.

Russell City Energy Center - Appendix A Figure 1
East Shore to San Mateo 230kV Transmission Line Reconductoring Project Location



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2002
SOURCE: Foster Wheeler Environmental Corp.

The East Shore-San Mateo line joins three other transmission lines within the Foster City industrial/commercial area. These four lines parallel one another, running west-northwest and then northwest the final 2.5 miles to the San Mateo Substation. The East Shore-San Mateo line is the easternmost of the four lines where it joins the others. As the line enters the City of San Mateo, the route crosses a levee at the edge of the Bay, then a small salt marsh, and finally a small bay before again reaching land. Heading northwest, the route runs to the west of a closed landfill and through an open space area that is part of an undeveloped shoreline park (Tidelands Park) paralleling J. Hart Clinton Drive. Residential land uses are located across the drive to the west, with the landfill and the Bay to the east. The route then runs northwest through a grassy strip immediately west of a large levee on the bayshore, and then finally turning northwest to connect with the San Mateo Substation. Land to the west of the levee and grassy strip is residential. The substation is located just southeast of the San Mateo Municipal Golf Course (part of Coyote Point County Recreation Area) adjacent to E. Poplar Avenue.

The East Shore-San Mateo line includes a total of 48 existing towers; eight of these are on the east side of the Bay, 21 are over the Bay, and 19 are on the west side of the Bay. About 10 of the 48 towers along the route may require modification as part of the reconductoring. These modifications would raise the towers by adding additional structure either at the base, the middle or the top of the tower. Of the 10 towers that may require modification, nine are on the west side of the Bay along a 2-mile section starting from where the line meets the shore. The other tower that may require modification is on the east side of the Bay near where the line begins to travel over the Bay, next to the San Mateo bridge.

Though not anticipated at this time, modifying the transmission towers may also require some additional work on the concrete foundation for one or more towers. The need for foundation work would be determined during inspections conducted by PG&E as part of forming the engineering plans for the reconductoring project. Foundation work could range from patching minor cracks in the concrete, to complete replacement of the foundation, which would require excavation work around the base of the tower. For the vast majority of reconductoring projects, however, excavation work near the towers is not needed.

2.2 CONSTRUCTION METHODS

In general, reconductoring is accomplished by disconnecting the old line and using it like a rope to pull the new line through the temporary pulleys, called "travelers" or "sheave blocks," that are mounted on each tower, until it reaches the other end. Workers access each tower by truck, or by boat or catwalk for the towers in the Bay, in order to place the temporary pulleys on each tower and route the cables through them. If the old line is not in good enough condition to be used to pull in the new line, it would be used to pull a carrier cable, or "sock line," through the pulleys to the end of the segment to be replaced; the sock line would then be used to pull the new conductors.

The work involves setting up two work crews on either end of the segment that is being replaced. Each crew generally consists of two large tractor/trailer units, which either feed out the new line or wind in the old line on spools mounted on the trailers, and two or three utility trucks carrying tools, other materials, and workers, for a total of 8 to 10

trucks and about 20 workers. One crew sets up at a "pull site" near a tower at one end of the pull, and the other at a "tensioning site" near a tower at the other end of the pull. The tensioning crew would employ a special tensioner truck, which is essentially a large drum winch that is used to put back tension on the line being pulled. Each pull generally is limited to about 2-3 miles, and the crews generally pull three cables (one three-phased circuit) at once.

The tensioning site crew either climbs or uses a truck-mounted aerial bucket (also called a "cherry-picker") to access the tower, disconnect the old conductors, and attach them through the tensioner truck to the new conductor on spools on the large trucks. The pull site crew also climbs the tower and disconnects the lines, and attaches them to the spools in the large trucks below the tower. During this time, other crews set up temporary structures across roads and other potentially inhabited areas to protect those areas in the unlikely event that a conductor breaks and the line falls to the ground.

Once all protective structures are in place and the pull and tensioning sites are ready, the pull crew then begins to carefully wind in the old lines onto the spools on the trucks, thus pulling the new lines through the pulleys on the towers along the segment being replaced, while the tensioning crew keeps the lines taught, preventing them from sagging to the ground or other objects in the right-of-way. Once the new lines are in place, the crews once again access each tower, disconnect the new lines from the pulleys and install them in permanent insulator clamps.

The crews usually pull the new conductors through two or more miles of transmission towers at a time. Because the potential for environmental impact is generally nonexistent between the pull and tensioning sites, this analysis focuses particularly on examining potential effects at the most likely pulling and tensioning sites, as well as at other locations that could be disturbed by truck movement, such as near towers that may require modification as part of the reconductoring. Activities between the pull and tensioning sites are generally restricted to 1) accessing the towers (either by climbing or using a truck-mounted aerial bucket) to place the pulleys and to remove the conductor from the pulleys and refasten it once stringing is completed; and 2) work on the tower structure itself to repair or replace spars that are damaged, or to replace insulators.

Though determining now precisely where the pull and tensioning sites would be located is not possible, they are generally sited at "angle" towers, which are located where the line makes a change in direction of more than 10 degrees. Pulling the old lines and reeling out the new conductors is easier at these locations because the pulling and tensioning equipment can be arranged in line with the transmission line. Conversely, the crews try to avoid pulling the line through one or more angle towers because the conductors cannot be efficiently pulled through such an angle. Pulling and tensioning can also take place at "deadend" sites, which are towers where the

transmission line is physically connected to the tower, rather than merely passing through the insulator clamps, and in general is where one spool of cable is spliced to the next spool. Deadend sites are generally located at angle towers, but also can be located at towers that are in-line with the route, rather than at an angle to the route. Deadend towers have significant structural strength and resist the forces of pulling. The

locations of deadend towers on the East Shore-San Mateo line are not known at this time.

Field studies conducted on April 25, 2002, located the angle towers between the East Shore and San Mateo substations. Most of the environmental impact analyses that follow will focus particularly on these towers, as they are the most likely sites for locating the pull and tensioning work crews. Each pulling or tensioning site work area would be a maximum of approximately 100 by 200 feet in size (0.46 acre), and generally would be considerably smaller than that. The exact locations the crews will work from would not be known until PG&E draws up final engineering plans for the reconductoring project.

The work crews likely will have a great deal of flexibility in choosing the locations of the pull and tension sites, as it may be possible to pull through the angles on some of these towers (less than 30 degrees). Because of the flexibility in locating work sites, crews can generally select sites that either avoid creating impacts altogether, or create less-than-significant impacts with certain mitigation measures enacted.

In addition to the angle towers, pulling and tensioning is also very likely at or near tower 2, because it is at one end of the Hayward-San Mateo Bridge. All likely pull or tensioning sites are accessible from existing roads. A few of the non-angle towers are not accessible from existing roads. These include several towers south of the eastern approach to the Hayward-San Mateo Bridge, all of the towers in the Bay where the transmission line parallels the bridge, one tower in the Bay north of the bridge, and one or more towers in open space in San Mateo south of the substation. Towers in the Bay are generally accessible either by catwalks or by boat.

Because the maximum length of the conductor that can be delivered to the site is about 15,000 feet, and because spliced cables cannot be pulled through the sheave blocks due to the size of the splice, PG&E would not be able to pull new line across the Bay, a distance of nearly 7 miles, using only ground-based pull or tension sites. Rather, PG&E would have to set up two pulling sites on barges anchored in the Bay. These barges would be towed to the work site using tug boats, and anchored into the Bay at a location about 200 feet from the tower where the line would be spliced. The barges would be anchored at all four corners, and the anchor lines would be tensioned such that the barge would not move, regardless of changes in the currents in the Bay, similar to the way dredging barges are sited.

The work crews would also have to set up equipment at each of the 10 towers that may have to be modified as part of the reconductoring project. Because the new conductors may sag closer to the ground during hot days when the lines are fully loaded, some towers may need to be raised about 11 to 16.5 feet in height. This

can be done through one of three methods: a "top cage" extension, where additional structure is added to the top of the tower to raise its top to the required level; a "waist cage" extension, where the top half of the tower is separated from the bottom half at about its mid-level, additional structure is inserted, and the top is replaced onto the new part of the structure; and a "base cage" extension, where the tower is separated from its concrete base, new structure is installed on the base, and then the tower is placed back

on top of the new structure. PG&E has stated that it would use either the top cage or waist cage method to modify the 10 towers identified above.

All 10 towers that may be modified as part of this reconductoring are accessible by land, meaning the work would be done with truck-based equipment. According to PG&E, these work areas would be similar in size to those for the pulling and tensioning sites. The equipment needed would consist of a truck-mounted crane capable of lifting the existing tower off its base, plus three or four smaller support vehicles. Workers would attach the crane to the tower, then separate the portion that would be elevated, and pull that portion up to provide clearance for the new structure. The new structure is welded and/or bolted in place, and the existing structure is then lowered back onto the new structure and welded and/or bolted in place. In most cases, the existing conductors would not have to be removed from the tower while it is modified.

Also during the reconductoring process, the work crews would likely replace all the insulators on all 48 transmission towers on the line. This work usually involves accessing the tower with a truck-mounted aerial bucket, or by climbing, removing the old insulator strings, and installing new ones. The new insulators are delivered and held in place by the aerial bucket and or rigging attached to the tower, or, for towers that cannot be access by truck, by helicopter. The towers will also be inspected for corrosion prior to reconductoring and, if necessary, will be repaired. Repairs can include corrosion removal by mechanical means, regalvanizing and repainting.

Throughout the reconductoring project, temporary staging areas would be required for equipment and materials storage. The East Shore-San Mateo reconductoring project would require two staging yards, each about 1 acre in size, with one located near each end of the transmission line. These staging or "marshalling yards" would likely be located at an existing industrial storage lot rented or leased for the four- to five-month construction period.

Reconductoring of the East Shore-San Mateo line would likely occur periodically over a period of several months during the off-peak months (October-April). The work could be confined to just one side of the Bay for a portion of that period, requiring only one marshalling yard during that time, before operations are shifted to the opposite side of the Bay. Because of reliability requirements[1], however, crews would be able to de-energize and replace only one of the two circuits on the line at a time. Each circuit consists of three cables hung on one side of the towers, with the other circuit consisting of the three cables on the other side of the towers. While one circuit is replaced, the other circuit would remain energized. Workers would pull in all three new cables at the same time, over a distance of approximately 2-3 miles at a time. Workers would occupy each pull or tension site for a total of about 3 days as that part of the line segment is replaced. The workers would then move on to the next pull and tension sites and set up to replace that section of the line.

[1] Because the two circuits on the East Shore-San Mateo line both are major "feeders" for power into the San Francisco Peninsula, at least one circuit must be maintained in service at all times.

3 ANALYSIS OF RECONDUCTORING

3.1 BIOLOGICAL RESOURCES

Introduction

The Applicant analyzed some potentially significant environmental impacts associated with reconductoring the transmission line in an Environmental Assessment (Calpine 2002), which provides a discussion of the reconductoring process and how it could be accomplished. Potential impacts to biological resources caused by the reconductoring of the East Shore-San Mateo line could occur near the construction work sites that would be established for the reconductoring. These sites include the pull and tensioning sites used to pull the new conductors onto the towers, the locations of any tower that may require modification as part of the reconductoring, the potential sites for staging or marshalling yards, and locations in the San Francisco Bay where the reconductoring may require use of barge-mounted construction equipment. This analysis focuses on the potential impacts that could occur at those work sites, and discusses potential mitigation measures that would avoid, eliminate, reduce to a less-than-significant level or compensate for those impacts.

Impacts of Reconductoring

The transmission line begins at the East Shore Substation in Alameda County extending west and southwest, paralleling the San Mateo Bridge while crossing San Francisco Bay. After crossing the bay, the transmission line extends west and northwest before terminating at the San Mateo Substation in San Mateo County. Distance spanned by the transmission line from the East Shore Substation to the San Mateo Substation is approximately 12.52 miles (Calpine 2002).

Primary concerns associated with reconductoring the transmission line are potential impacts to sensitive species and habitats in and adjacent to the transmission line corridor caused by construction activities needed to accomplish the reconductoring. For a list of sensitive species that occur or have potential to occur within or near the transmission line corridor, see **Table 1** below.

Appendix A Table 1
Sensitive Species Near the East Shore-San Mateo Line

Common Name	Scientific Name	Federal/State/CNPS Status*
Salt-marsh harvest mouse	*Reithrodontomys raviventris*	E/E/-
Western snowy plover	*Charadrius alexandrinus nivosis*	T/SC/-
California clapper rail	*Rallus longirostris obsoletus*	E/E/-
Double crested cormorant	*Phalacrocorax auritus*	-/SC/-
California least tern (nesting)	*Sterna antillarum browni*	E/E/-
Congdon's tarplant	*Hemizonia parryi* ssp. *Congdonii*	SC/-/1B
Point Reyes bird's- beak	*Cordylanthus maritimus* spp. *Palustris*	SC/-/1B
hispid bird's- beak	*Cordylanthus mollis* spp. *Hispidus*	SC/R/1B
Delta tule pea	*Lathyrus jepsonii*	SC/-/1B
Mason's lilaeopsis	*Lilaeopsis masonii*	SC/R/1B
Hairless popcorn flower	*Plagiobothrys glaber*	SC/-/1A
alkali milk-vetch	*Astragalus tener* var. *tener*	SC/-/1B

* E=Endangered, T= Threatened, SC=Species of Concern, (-) = Not Listed.
CNPS (CNPS 2001) List: 1A = Presumed extinct in California; 1B = Rare or Endangered in CA and elsewhere.

In addition to potential impacts to sensitive vertebrate and plant species, the reconductoring work could also result in potential adverse impacts to fresh/salt water wetlands along or near the transmission line route. Sensitive biological resource areas near the transmission line include: East Bay Regional Park's Salt-Marsh Harvest Mouse Preserve and Freshwater Marsh, Hayward Area Recreation District's (HARD) Interpretive Center Marsh and its HARD Marsh, and the San Francisco Bay National Wildlife Refuge.

Biological field surveys for the transmission line corridor were conducted on April 25, 2002 (Calpine 2002). Results of mapping and field surveys indicated several wetlands exist either within or adjacent to the transmission line corridor. No occurrences of sensitive vertebrate or plant species were reported. However, no wetland determinations/delineations or surveys for late blooming sensitive plants were conducted (Calpine 2002).

Though the Applicant's Environmental Assessment indicated otherwise, PG&E stated that the reconductoring project would likely also include raising the height of some existing towers (Daniels 2002). PG&E also stated that the section of transmission line spanning San Francisco Bay likely would require two barge-based pull-tension sites in the Bay (Daniels 2002). Tower modification activities and the use of an aquatic pull-tension site could adversely impact sensitive species and/or habitats beyond what Calpine discussed for the reconductoring process. Calpine has indicated that temporary staging or marshalling areas would be required near each end of the transmission line. Each staging area would be approximately one acre in size and would likely be located at industrial storage lots (Calpine 2002).

Construction activities associated with the reconductoring project would occur at conductor pull and tension sites, which would likely be located at some of the 12 angle towers along the line (towers where the transmission line changes direction by at least 10 degrees), and where towers would be modified.

Calpine estimated that approximately one-half acre would be needed for each pull or tensioning site. Equipment needed for a typical reconductoring project includes two large 10-wheel trucks each at the pull and tensioning sites, plus two to four additional smaller trucks. Tower modifications would require use of a large crane and/or a helicopter. The movement and use of this equipment could create impacts to biological resources. Impacts that could occur include disturbance of habitat caused by movement of the construction equipment, disturbance of nesting activities caused by construction noise and movement of machinery, and potential take of listed species caused by construction activities at the angle tower sites or the modified tower sites.

For a list of habitat types and potential impacts associated with each angle tower see **Table 2** below. New information provided by PG&E (Daniels 2002) indicates that other towers not listed in **Table 2** would need modification. PG&E provided general locations for non-angle towers requiring modification (see Chapter 2 of this Appendix), but specific locations for these towers have not yet been provided.

Appendix A Table 2
Potential Impacts at Angle Towers and Substations

Tower # & Substations (east to west)	Habitat Type	Potential Impacts
East Shore Substation	Ruderal, Coastal Salt Marsh	Wetlands
Angle Tower 1	Ruderal, Coastal Salt Marsh	Wetlands, Snowy Plover
Angle Tower 2	Coastal Salt Marsh	Wetlands, Snowy Plover, Least Tern, Clapper Rail, Salt Marsh Harvest Mouse.
Angle Tower 3	Aquatic (San Francisco Bay)	Dredge/fill bay, Anadromous Fish, Double Crested Cormorant, Shallow Water Habitat.
Angle Tower 4	Coastal Salt Marsh	Wetlands
Angle Tower 5	Ruderal, Urban	--
Angle Tower 6	Ruderal, Urban	--
Angle Tower 7	Ruderal , Urban	--
Angle Tower 8	Ruderal, Freshwater Marsh	Wetlands, Waterfowl
Angle Tower 9	Coastal Salt Marsh	Wetlands, Waterfowl
Angle Tower 10	Coastal Salt Marsh	Wetlands, Waterfowl
Angle Tower 11	Ruderal, Freshwater Marsh	Wetlands, Waterfowl
Angle Tower 12	Ruderal, Freshwater Marsh	Wetlands, Waterfowl
San Mateo Substation	Ruderal, Freshwater Marsh	Wetlands, Waterfowl

Of particular concern for the Biological Resources analysis is the section of transmission line between angle towers 1 and 2, on the East side of the Bay near the foot of the San Mateo-Hayward Bridge. Angle tower 1 is located in ruderal vegetation, but is accessed over paved roads (Calpine 2002). However, this tower is located between ponds 14B and 12B in the Eden Landing Ecological Reserve, which is managed by the California Department of Fish and Game. Also, the section of transmission line between angle towers 1 and 2 traverses ponds 14B, 15B and 16B, also in the Eden Landing Ecological Reserve (Foreman 2002). Ponds 12B, 14B, 15B and 16B are considered important breeding habitat for the western snowy plover (Wilcox 2002). The western snowy plover is listed as federally threatened and a state species of concern. Salt marsh habitats on the north side of State Route 92 near the section of transmission line between angle towers 1 and 2, support populations of western snowy plover, salt marsh harvest mouse (federal and state listed, endangered) and California clapper rail (federal and state listed, endangered). Angle tower 2 is located in salt marsh habitat, south of State Route 92 on the east shore of San Francisco Bay. Nesting western snowy plovers are documented in habitat approximately 500 feet north of angle tower 2 (EBRPD 2001). One non-angle tower in this area may also need to be modified (Daniels 2002). Construction activities could disturb habitat for these species, and could disrupt the breeding of the species if construction occurs during nesting times.

Some towers in San Francisco Bay, including angle tower 3, are used for nesting by double crested cormorants (state species of concern). Adverse impacts to wetlands, waterfowl and migratory birds are the primary concerns on the western side of the bay (angle towers 4, 8-12 and the San Mateo Substation).

Mitigation

Calpine indicated that all wetlands would be avoided by placing pull-tensioning sites on upland, ruderal areas or paved surfaces. Breeding birds would be avoided by limiting construction periods or by installing noise attenuation on construction equipment. Vehicle use would be limited in areas where sensitive habitats are located. Calpine also

indicated that if the aforementioned means of impact avoidance were found to be infeasible at the time of construction, a helicopter could be used to minimize ground disturbances. Further, construction activities would be monitored by qualified personnel (Calpine 2002). However, no formal reconductoring plan has been developed.

Consequently, no measures to mitigate adverse impacts to biological resources associated with reconductoring the transmission line have been formally proposed. However, no formal reconductoring plan can be developed until PG&E prepares an application for such a project. At the time this review was written, PG&E had not reviewed the Calpine Environmental Assessment and was not aware of some of the potentially adverse impacts associated with reconductoring the transmission line (Daniels 2002). Therefore, Calpine's discussion of potential impacts and mitigation measures may be different from any future discussion provided by PG&E.

However, before work could begin on reconductoring the East Shore-San Mateo line, the California Public Utilities Commission would conduct its own environmental review of the reconductoring project, and would mandate implementation of mitigation measures for any identified potentially significant impacts. The CPUC routinely mandates standard construction mitigation measures, such as the use of Best Management Practices (BMPs) for all construction activity, for all reconductoring projects it approves. With implementation of these standard measures, plus those that address potential impacts specific to this reconductoring project, such as the need to compensate for any habitat disturbance or take caused by transmission tower foundation work, it is likely that the identified reconductoring project could be accomplished without creating a significant impact to biological resources. Before mitigation can be proposed, however, the project and its potential impacts must be clearly defined, including exact identification of work site locations. PG&E and Calpine have provided general descriptions of what will be required for reconductoring, but no formal work plan has been developed.

Conclusion

Because it appears some of the reconductoring work would occur in or near sensitive species and/or habitats, staff concludes that reconductoring the East Shore to San Mateo 230 kV transmission line could adversely impact sensitive biological resources in and/or adjacent to the transmission line corridor. Potential impacts include construction noise effects on nesting activities, and construction activity physical effects on wetlands.

It is staff's opinion that impact avoidance measures discussed in Calpine's Environmental Assessment (Calpine 2002) could help reduce potentially significant biological impacts to levels less than significant. However, in the unlikely event that new tower foundations are required, habitat disturbances could be permanent in nature.

Without a complete description of what will be required for the reconductoring process, and where that work will be conducted (project description), it is not possible to provide a complete analysis of potential adverse impacts to biological resources. Staff recommends that after construction plans are finalized, a complete project description (including wetland delineations, results of all sensitive species surveys, and a revised assessment of potential impacts) be submitted to the CPUC. Activities associated with reconductoring the transmission line would require compliance with applicable Federal,

State and local laws, ordinances and regulations, including: Federal and State Endangered Species Acts, Federal Migratory Bird Treaty Act, and Federal and State Clean Water Acts. Specific agency permits might be required before any reconductoring work could commence. To determine which permits may be applicable to reconductoring the transmission line, staff recommends that the CPUC consult with the following agencies: California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corp of Engineers, Regional Water Quality Control Board and the Bay Conservation and Development Commission.

Therefore, if the reconductoring work complies with all applicable LORS, mitigation measures proposed by the Applicant are implemented, and standard Best Management Practices for construction activities are employed, the reconductoring of the East Shore-San Mateo line would not likely create significant impacts to Biological Resources.

3.2 CULTURAL RESOURCES

Introduction

The applicant is proposing to reconductor the East Shore to San Mateo 230kV transmission lines, consisting of two circuits on a single set of towers. The line will extend 12.52 miles from the East Shore Substation across the San Francisco Bay to the San Mateo Substation. The applicant has identified 10 potential cultural resources within ¼ mile of the project. Mt. Eden Creek is within ¼ mile of the East Shore Substation and the shoreline is crossed by the reconductoring route. The resource rich environment of the shoreline and creek make it likely that this was an area with considerable human habitation.

The applicant states that the sensitivity for both historic and historic archaeological resources is high along the proposed route. These include the previously recorded

historic refuse dump CA-ALA-500H and the East Shore-Grant Transmission Line (P.3-22). The San Mateo Substation would need to be evaluated to determine whether it is eligible to be listed as an historic resource, given that it may be greater than 45 years old or may be exceptional in nature. Historic archaeological deposits, possibly Chinese in origin, were previously recorded in the vicinity of the East Shore Substation.

The potential for encountering Native American artifacts makes it necessary to contact The Native American Heritage Commission (NAHC) to obtain a list of concerned Native American's in the area. The proposed reconductoring area is within the ancestral area of the Chochenyo language group. The Chochenyo are part of the larger Coastanoan/ Ohlone language group.

Additional known or potential historic resources that will need to be considered along the route are the East Shore-San Mateo transmission line and the San Mateo-Hayward Bridge.

Impacts of Reconductoring

Ground disturbance, the presence of vehicles driving over the top of sites and the installation of new towers could damage archaeological resources. After the

archaeological and historic surveys are complete and after the work area is defined, additional archaeological sites or historic resources within the built environment may be identified. If the East Shore-San Mateo line is determined eligible for the National Register of Historical Places (NRHP) or the California Register of Historical Resources (CRHR), the reconductoring effort would result in an impact to historical resources. Whether the impact is significant would need to be determined after the line is evaluated. Depending on why the line is eligible, the impact could be less than significant. Moreover, the nearby Grant to East Shore transmission line was built in 1922 (p.3-24). The original recorder of the transmission line recommended it was eligible for the NRHP and CRHR. However, the identified reconductoring project likely would not create a significant impact to the Grant to East Shore line.

Mitigation

The Applicant recommends that an archaeological and historic survey be conducted after the major work areas are identified. If sensitive archaeological or historic resources are identified, the applicant recommends a preconstruction assessment and development of a training program. In addition, the Applicant recommends monitoring when excavation, pulling and tensioning or other key project activities are taking place within archaeological sites (p.3-26). If cultural material is identified, the Applicant recommends that construction halt until the find can be evaluated. Additional mitigation measures recommended by the Applicant include site evaluation and recording, a mitigation plan, and curation.

Staff recommends that after the construction area has been identified and after the cultural resources surveys are completed that archaeological sites be evaluated for eligibility for listing in the NRHP or CRHR. Data recovery should be conducted as a mitigation measure for archaeological sites that are recommended as eligible to the CRHR or NRHP and would be impacted by the project. Monitoring of project-related excavation within an archaeological site is not appropriate mitigation and may destroy the site.

The applicant also recommends evaluation of the East Shore-San Mateo line. Recordation, which includes documentation of the line with an historic narrative, photographs or architectural drawings provided on the appropriate Department of Parks and Recreation forms, may serve as mitigation for impacts to this line if it is recommended as eligible to the NRHP or CRHR. The NAHC would need to be contacted to determine whether there are any Native American sacred sites in the vicinity of the work.

Conclusion

It appears that the proposed reconductoring route is sensitive for cultural resources. It is likely that some of the resources will be affected as a result of the reconductoring effort. From the information supplied by the applicant, however, it appears that it will be possible to mitigate all impacts to cultural resources to less than a significant level, for example by avoiding known sensitive areas and monitoring construction activities, as described above, or other appropriate mitigation.

3.3 LAND USE

Introduction

The Land Use analysis focuses on the project's compatibility with the existing and planned land uses, and the project's consistency with local land use plans, ordinances, and policies.

As provided in Calpine's environmental assessment, the reconductoring project utilizes existing transmission towers in an established utility corridor and conforms to all applicable regulations and general plan goals of the Cities of Hayward, Foster City and San Mateo. Zoning along the established utility corridor consists of Industrial and Open Space within the City of Hayward. The area classified as Open Space within the City of Hayward is currently unused land and was formerly used for salt evaporation ponds. Crossing the San Francisco Bay adjacent to the Hayward-San Mateo Bridge (State Route 92) into Foster City, the area is classified Industrial. Within the City of San Mateo the reconductored transmission line will angle its way through commercial, light industrial, warehouse districts, land adjacent to an undeveloped shoreline park, and land adjacent to existing residentially zoned districts.

Impacts of Reconductoring

The reconductoring of the electric transmission line would require the temporary stockpiling of materials and equipment in approved areas along the existing PG&E right-of-way. Any impacts to land use would be isolated and short term while construction crews reconductor the existing transmission lines. Because the temporary stockpile areas would be temporary and would not displace any existing use, the impact would not be significant.

Reconductoring would also require access to the existing transmission line right-of- way by construction vehicles and equipment, which would use existing access roads.

Mitigation

There are no significant land use impacts along the electrical transmission line route related to the identified reconductoring project, and mitigation measures are not warranted.

Conclusion

Reconductoring of the East Shore-San Mateo transmission line would not cause a change in land use. Staff concurs with the conclusion in Applicant's Environmental Assessment that the existing PG&E right-of-way is adequate for the reconductored line and will not require widening. Since it would be entirely within an existing and established right-of-way, the reconductored transmission line would not disrupt or divide the physical arrangement of an established community. Also for these reasons, the reconductored transmission line would not restrict existing or future land uses along the route.

3.4 NOISE

Introduction

Reconductoring the East Shore-to-San Mateo line would require operation of heavy equipment at pull and tensioning sites, and at several transmission towers that may require modification. The applicant identifies six potential sites for pulling and tensioning sites along the line on the western side of the bay. The potential for heavy equipment operation to disturb adjacent noise-sensitive land uses during the temporary period of line work was reviewed by the Applicant in its Environmental Assessment (RCEC 5/6/02). After the reconductoring work is complete and the lines are operational, the Applicant expects no change in corona noise levels.

Impacts of Reconductoring

Reconductoring work would require operation of construction-type equipment at the pull and tensioning sites. The applicant anticipates less than one week of work at any location and identifies no sensitive receptors within 300 feet of any of the potential work sites. At a distance of 300 feet, most construction equipment would not be louder than approximately 70 decibels, which would not be likely to disturb surrounding commercial or undeveloped land uses. To manage noise from the work sites, the applicant presumes that work would only occur between 7 a.m. and 5 p.m. on weekdays and that a noise complaint process would be implemented.

After reconductoring the lines, CEC staff would not expect any substantial increase in corona noise levels. Corona noise is a function of the line voltage and the condition of the line. Because voltage would remain the same after reconductoring and the condition of the line would be upgraded, corona noise may actually be reduced.

Mitigation

Energy Commission staff recommends implementation of mitigation measures similar to the proposed Conditions of Certification from the Staff Assessment NOISE-1, NOISE-2, and NOISE-8 to minimize potential impacts by implementing the complaint resolution process and specifying construction hours. For convenience, those Conditions of Certification are listed below:

NOISE-1 At least 15 days prior to the start of ground disturbance , the project owner shall notify the City of Hayward, the Hayward Area Recreation District, the East Bay Regional Parks District, and residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

NOISE-8 Heavy equipment operation and noisy construction work shall be restricted to the times of day delineated below:

Monday-Saturday	7:00 a.m. to 7:00 p.m.
Sundays and holidays	10:00 a.m. to 6:00 p.m.

Conclusion

By implementing mitigation measures similar to the Conditions of Certification that were proposed in the Staff Assessment for construction of the RCEC plant, potential noise impacts from reconductoring work would be avoided.

3.5 TRAFFIC AND TRANSPORTATION

Introduction

The existing transportation network that would be affected by the reconductoring project is comprised of State Route (SR) 92, a route of regional significance, and local roadways in the Cities of Hayward, Foster City and San Mateo. SR 92 connects the City of Hayward and the entire East Bay with the City of Foster City and the entire San Francisco Peninsula. It includes the San Mateo Bridge spanning the San Francisco Bay. On a daily basis, SR 92 serves 98,000 vehicles, with westbound the peak direction during the morning and eastbound the peak direction during the evening.

The applicant has estimated that the project will require a maximum of 20 workers over a four to five month period. Three to five pieces of equipment (i.e. tensioners and cable pullers mounted on large trucks) and support vehicles will be required at each work site. The applicant has not specified where these trucks would be stationed during the tensioning and cable pulling activity.

Impacts of Reconductoring

The proposed reconductoring project could affect the level of service (LOS) for transportation facilities under the jurisdiction of Caltrans and the Cities of Hayward, Foster City and San Mateo.

SR 92 (San Mateo Bridge), which is a Caltrans facility, operates at near capacity with an LOS of E/F during both morning and evening peak periods. Although the reconductoring project will require no more than 20 workers, adding any additional vehicles to this roadway of regional significance could result in increased delays and congestion. In addition, many of the roadways leading to the San Mateo Bridge and the industrial storage yards in the bridge vicinity (i.e., Clawiter Road, Industrial Boulevard, and Arden Road in Hayward; Foster City Boulevard, Beach Park Boulevard, and 3rd Avenue in Foster City; and J. Hart Clinton Drive in San Mateo) are experiencing delays as a result of congestion on SR 92.

The number of reconductoring project workers arriving during the morning peak hour and leaving during the evening peak hour could result in further LOS degradation on SR

92 and the surrounding local transportation system. The movement of heavy machinery or the possible need to use rail lines to deliver equipment or materials to the project site could also affect the surrounding transportation system.

Occasionally during overhead construction projects, materials fall into the roadway, resulting in a safety hazard. This potential impact can be avoided through mitigation, which is discussed below.

Mitigation

In order to mitigate potential impacts of the reconductoring project on the surrounding roadway system, the work crews involved should avoid adding any vehicles to SR 92 during peak travel times. This avoidance can be accomplished through using off-site (i.e. off of SR 92) facilities for reconductoring staging and laydown, non-peak hour scheduling, and workers carpooling to the job site. These measures would reduce the potential for project-related congestion in the immediate area of the bridge.

Using off-peak period scheduling for delivery of equipment and materials via trucks or rail service can also avoid potential impacts during peak hour conditions. Scheduling worker arrival and departure patterns to occur before the morning peak period (i.e. 6:00 to 9:00 AM) and before the evening peak period (i.e. 3:30 to 6:30 PM) would also mitigate potential impacts of the reconductoring project. Finally, installation of protective structures as a safety precaution would reduce the potential for construction materials falling on motorists, bicyclists, or pedestrians during the tensioning/cable pulling process.

Conclusion

Implementation of these mitigation measures would most likely ensure that any potential impacts of the reconductoring project to traffic and transportation will be insignificant.

3.6 TRANSMISSION LINE SAFETY AND NUISANCE

Introduction

The electric and magnetic field impacts that were addressed in the Final Staff Assessment (FSA) for the Russell City Energy Center (RCEC) would also be of potential concern for the area along the route of the reconductored line. As noted in the RCEC FSA, the magnitude of such fields depends on line voltage and current levels. The potential for perceivable field impacts and significant field exposures would depend on the chosen design, the current levels, and distance from the line.
Impacts of Reconductoring

Since the retrofitted line would be operated at the same voltage (230 kV) as the existing line, the magnitude of the electric field along the line route would not change from current levels, meaning that the types of electric field impacts that were addressed with respect to the RCEC-related transmission line would not change from the levels associated with the line to be reconductored. The only field-related change from the retrofit (and its related increases in current flow) would be with respect to the magnetic field, whose intensity depends directly on current levels, as noted in the RCEC assessment.

Since the retrofitted line would be located within the route of the existing line, the retrofit-related increases in magnetic field intensity would lead to corresponding increases in human exposure to the line's magnetic fields. As noted in the submittal from the Russell City Energy Center (2002, page 5-58), the nearest residences to the route are approximately 100 feet away, meaning that the residential magnetic field exposures at the root of the present health concern would be as insignificant for the reconductored line, as staff considers it for the existing line. The only field exposures of potential significance are to line workers and individuals in transit across the line. These types of exposures are well understood as not significantly related to the present health concern. The present CPUC design and operational requirements are intended to minimize these and other human exposures without affecting line safety, reliability, and efficiency.

Mitigation

As discussed in the RCEC FSA, the CPUC's method of ensuring the appropriate management of fields from high-voltage power lines (in light of the current health concern) is to require incorporation of specific field-reducing measures in the design for new or retrofitted lines. The applicable measures for the proposed RCEC line and the reconductored East Shore-San Mateo line are those specified in PG&E's guidelines prepared in compliance with CPUC's requirements. Staff's recommended conditions of conditions of certification in the RCEC FSA are intended to ensure compliance with this CPUC policy as related to field strengths, perceivable field effects, electric shocks, and human exposure. Since this reconducted line would be designed and operated according to standard PG&E practices, as noted in the submittal from the Russell City Energy Center (2002, pages 1-1 through 2-8), staff would expect the line will be operated in compliance with the applicable health and safety laws, ordinances, regulations and standards (LORS).

Conclusion

The retrofitted East Shore to San Mateo 230 kV line would be designed, built and operated (within the existing route) according to CPUC's requirements, reflecting compliance with the health and safety LORS of concern to staff. Therefore, staff would not expect its operation to pose a significant health and safety hazard to individuals in the area.

3.7VISUAL RESOURCES

Introduction

Starting at the East Shore Substation in the City of Hayward, the East Shore-San Mateo transmission line travels through a light industrial area for approximately 0.5-mile and then through an area of abandoned salt evaporation ponds for another 1.5 miles. The line then crosses San Francisco Bay, a highly important visual resource, running parallel to the Hayward-San Mateo Bridge (State Route 92) a short distance to the south of the bridge. On the western end of the bridge, the transmission line crosses State Route (SR) 92 and travels west through an industrial and commercial area of Foster City, with the transmission towers located mostly in parking lots and paved storage areas. In Foster City, the line joins three other transmission lines, running parallel to these lines on its route toward the San Mateo Substation. Before reaching the substation, the line travels northwest through an open space area, which is part of

an undeveloped shoreline park that offers views of the Bay, located near residential areas in the City of San Mateo.

Impacts of Reconductoring

The East Shore to San Mateo reconductoring project is expected to last about 4 to 5 months; however, it may be necessary to reconductor the transmission line's two circuits separately to protect system reliability. In addition, the project would likely occur during times of low electrical demand, which may mean that the project would require two seasons to accomplish all the work. The reconductoring project would require two temporary staging areas for equipment and materials storage. The staging yards, one at each end of the transmission line, would likely be located at existing industrial storage lots. Conductor pulling and tensioning equipment would be located at various sites along the transmission line. Construction equipment and activities would likely be visible to a high number of viewers, including motorists on SR 92 and residents living near the line in San Mateo. Due to the relatively temporary nature of project construction, the adverse visual impacts that would occur during construction would not be significant. However, this conclusion assumes that construction areas and rights-of-way are restored to their pre-project conditions.

Reconductoring involves the replacement of existing electrical transmission wires (conductors) with new wires. This change to the East Shore to San Mateo transmission line would likely be undetectable to most viewers of the line, including motorists on SR 92 and residents living near the line in San Mateo. The reconductoring would also involve modifying 10 existing towers to raise the height of the towers as much as 16.5 feet in order to accommodate the sag requirements of the new wires. Because the existing transmission line and towers are an established part of the setting, and the modification would raise the existing towers less than 10 percent of their present height, the adverse visual impacts that would occur due to installation of the new wires, and any changes in tower height or design, would likely not be significant. However, this conclusion assumes that the new wires and towers would incorporate typical measures to mitigate potentially significant adverse visual impacts, such as those listed below.

Mitigation

With the inclusion of the following typical mitigation measures, impacts from construction activities related to reconductoring would likely not be significant:

- All evidence of construction activities, including ground disturbance due to staging and storage areas should be removed and remediated upon completion of construction.
- Construction areas and rights-of-way should be restored to their original grade and contouring.
- Any vegetation removed in the course of construction should be replaced on a 1-to-1 in-kind basis.

With the inclusion of the following typical mitigation measures, operation of the reconductored line would likely not cause significant adverse visual impacts:

- Transmission towers should be treated with non-glare finishes and painted in colors that would blend with the surrounding environment;
- Non-specular conductors should be used; and
- Insulators should be non-reflective and non-refractive.

Conclusion

The reconductoring project has the potential to cause adverse visual impacts, such as through the use of inappropriate paints and finishes that would make existing or new structures more dominant in the existing viewshed. However, feasible mitigation measures are available that would likely keep the visual impacts of the reconductoring project to levels that would not be significant. Other mitigation measures to reduce the visual impacts of the project may be identified as more detailed and specific environmental information is developed and analyzed.

3.8.SOIL AND WATER RESOURCES

Introduction

In association with the proposed 620 MW Russell City Energy Center (RCEC), it may be necessary for PG&E to reconductor a 12.52-mile long section of 230 kV transmission line that travels between the East Shore and San Mateo Substations. Soil types for the transmission line route tend to be of Reyes, Danville and Willows Clays and Silty Clays. These soils tend to be very deep and poorly drained and are characteristic of clays formed in tidal flats. These soil types have low erosion potential, low permeability and a high potential for shrinking and swelling. Land in the vicinity of the transmission line corridor is gently sloped or flat in topography.

Impacts of Reconductoring

Towers and Footings

There are a total of 48 towers between the substations. PG&E has indicated it would raise the height of 10 of these towers to allow for greater conductor sag. Though unlikely, some towers may require new foundations, increasing the potential for disturbance and erosion of soils. If any new towers and footings are constructed in the Bay or in wetlands, Best Management Practices (BMPs), such as dewatering facilities and limiting disturbed areas, would be implemented to avoid water quality degradation. By implementing BMPs, the aforementioned activity would be less than significant.

Reconductoring without New Towers and Footings

If existing towers can be used or reinforced without construction of new towers and footings, the potential for impacts to soils and water resources is significantly reduced. Work sites using larger truck-mounted equipment would likely be limited to areas near angle towers (greater than 20 degrees). PG&E and the Applicant have identified the locations of 12 angle towers along the route, and they estimate they would set up pull or tension sites at six of these locations. Temporary pull and tensioning sites would require an area of about 100 by 200 feet (0.5 acre) for equipment setup. Crews may also set up work areas of similar size near 10 towers along the route that may require modification. These temporary sites would be susceptible to erosion from soil

disturbance and compaction as a result of the vehicular traffic; however, the soil types in the potentially affected areas are clays, which generally have a low erosion hazard potential.

Mitigation

Towers and Footings

The following mitigation measures should be implemented for earth disturbance activities associated with any needed work on tower footings:

- Construction should be performed in accordance with an Erosion and Sediment Control Plan (ESCP). The ESCP should address soil stabilization during construction, and revegetation following construction. The Cities of Hayward, Foster City and San Mateo would likely serve as the reviewing authorities for the ESCP.
- Construction should be performed in accordance with a Storm Water Pollution Prevention Plan (SWPPP). The San Francisco Bay Regional Water Quality Control Board (RWQCB) would likely serve as the reviewing authority of the SWPPP, and may require a General NPDES Permit for Storm Water Discharge Associated with Construction Activity. The RWQCB may also designate issuing Waste Discharge Requirements associated with construction activities.
- Existing roads and rights of way should be used to the greatest extent possible.

The following mitigation measures should be implemented for construction activities in and around water bodies associated with the new tower footings:

- The removal or placement of fill within the bay or wetlands will require a Section 404 Permit from the Army Corps of Engineers (ACOE) to Place or Discharge Dredged or Fill Material. Associated with the ACOE 404 Permit, the San Francisco Bay RWQCB or State Water Resources Control Board (SWRCB) would likely issue a Section 401 Water Quality Certification.

Reconductoring

For temporary disturbance areas established on soil for pull and tensioning sites, and for work sites set up to modify existing towers, the following mitigation should be included:

- Construction should be performed in accordance with an Erosion and Sediment Control Plan (ESCP). The ESCP should address soil stabilization during construction, and revegetation following construction. The Cities of Hayward and San Mateo would likely serve as the reviewing authorities for the ESCP.
- Construction should be performed in accordance with a Storm Water Pollution Prevention Plan (SWPPP). The San Francisco Bay Regional Water Quality Control Board (RWQCB) would likely serve as the reviewing authority of the SWPPP, and may require a General NPDES Permit for Storm Water Discharge Associated with Construction Activity.
- Existing roads and rights of way should be used to the extent possible.

Conclusion

The identified reconductoring project would cause no displacement of agricultural land use, and neither construction nor operation of the transmission line would cause a significant impact to agricultural resources. Significant environmental impacts to soil and water resources will be avoided by implementing the mitigation listed above.

3.9 TRANSMISSION SYSTEM ENGINEERING

Introduction

Reconductoring of the East Shore to San Mateo 230 kV double circuit line, should it occur, would involve removing the 954 kcmill ACSR conductors and replacing them with 954 kcmill SSAC conductors, in a manner that complies with applicable safety and reliability standards. This would result in approximately a doubling of transmission capacity. Insulators would also be removed and replaced with new strings, which would increase the line's capability to withstand voltage surges. Please see Chapters 1 and 2 of this Appendix for additional description of the likely construction areas and methods.

Impacts of Reconductoring

During construction, applicable safety and reliability Laws, Ordinances, Regulations and Standards (LORS) must be met. These include CPUC General Order 95, Title 8 CCR Construction Safety Orders, and PG&E Construction Standards. Additionally, to maintain system reliability the Cal-ISO must be advised per the Cal-ISO scheduling protocol of scheduled circuit outages prior to occurrence. Such outages are scheduled about 30 days prior to occurrence and are verified just prior to actual outage. In the event that system reliability requires restoring such circuits, a "no work" order is given and where practicable, circuits are restored.

Reconductoring of the East Shore-San Mateo 230kV Transmission Line would result in local system benefits, in that it would provide considerably greater flexibility in routing power in the Bay Area transmission network, even if the Russell City Energy Center is not built. The reconductoring project would not only ensure that the Russell Energy Center project could generate at its rated capacity, but would increase the capacity and reliability of power deliveries into the San Francisco Peninsula, especially in the areas north of the San Mateo substation when local generation is not available, though parts of the transmission and distribution system north of San Mateo may also have to be upgraded in order to take full advantage of the increased capacity of the East Shore-San Mateo line.

Mitigation

To mitigate potential safety and reliability impacts the above stated LORS and Cal-ISO scheduling protocols would be used. The CPUC assures conformance with the above safety requirements; the Cal-ISO would assure conformance with its reliability requirements.

Conclusion

Conformance with applicable safety and reliability is likely to occur and would be successful in mitigating any safety or reliability implications of reconductoring.

3.10 GEOLOGY AND PALEONTOLOGY

Introduction

The existing East Shore to San Mateo Transmission Line generally traverses unconsolidated sediments deposited within and along the margins of San Francisco Bay. These sediments typically comprise recent alluvium along the margins of San Francisco Bay and young bay mud on the floor of the Bay. The young bay mud is a plastic, poorly sorted, organic-rich clay and silty clay, with interbedded thin beds of well-sorted silt, sand, and fine gravel that was deposited in a marine environment following the end of the last low sea-level stand about 11,000 years ago (Atwater et al., 1977). Because of its young age and marine origin, young bay mud has limited potential as a host of scientifically unique fossils.

The young bay mud is generally between 20 and 60 feet thick at the RCEC project site and along the East Shore to San Mateo Transmission Line corridor (CDMG, 1969). The young bay mud is underlain by more consolidated older bay mud deposits.

No active or potentially active faults are known to cross the Transmission Line Corridor. The closest known active faults are the Hayward fault, which is located 5.3 kilometers (3.3 miles) east of the east end of the corridor and the San Andreas fault, which is located 6.9 kilometers (4.3 miles) west of the west end of the Transmission Line Corridor. These faults are designated a class "A" faults under the CBC (a fault with a maximum magnitude earthquake greater than 7 and a slip rate in excess of 5 mm/year). The maximum magnitude earthquake for the segment of Hayward fault closest to the project is a moment magnitude 7.0 event. The maximum magnitude earthquake on the Peninsula and North Coast segment of the San Andreas fault is a moment magnitude 7.9 event. A maximum magnitude earthquake on either of these faults will produce strong ground shaking along the transmission line corridor.

The California Division of Mines and Geology (CDMG) Map Sheet 48 (Petersen et. al., 1996), predicts a peak ground acceleration with a 10 percent probability of exceedance in 50 years of between 0.5 and 0.7g for the project corridor. Since the corridor overlies younger Bay mud (CBC Soil Profile Type S_f), the corridor will likely experience amplification of seismic shaking and potential liquefaction during an earthquake.

Impacts of Reconductoring

Since no new facilities are anticipated, the impacts to geologic and paleontological resources would be limited to temporary construction sites. These sites would not require substantial grading or other disturbance of surface soils. As a result the impacts to geologic and paleontological resources would not be significant.

In addition, the identified reconductoring project would not change the impacts of the seismic hazards on the East Shore to San Mateo Transmission line. Since the East Shore to San Mateo Transmission Line corridor is does not cross a fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist, the potential for fault rupture is not significant. Similarly, the reconductoring project would not likely result in impacts from strong ground shaking, liquefaction, seismic seiches, nor landslides or other slope failures.

Mitigation

No additional mitigation measures are required.

Conclusion

PG&E would likely be able to comply with applicable LORS as related to the identified reconductoring project. No significant geologic or paleontological resources have been identified in the project area. The existing transmission line was designed and constructed in accordance with the Seismic Zone 4 requirements contained in the CBC. In addition, the Applicant proposes to mitigate impacts due to seismic hazards by complying with the requirements and design standards of the CBC (1998). The project should have no adverse impact with respect to geologic and paleontologic resources if it complies with applicable LORS.

4 CONCLUSION

Chapters 2 and 3 of this Appendix describe the process and the potential impacts of reconductoring the East Shore-San Mateo 230kV Transmission Line. This study was undertaken to inform the Energy Commission and the general public of the potential indirect environmental and public health effects caused by the approval of the RCEC project..

The environmental and engineering disciplines can be divided into two groups: those with the potential for significant impacts, and those in which impacts are easily mitigable or less than significant. This analysis determined that impacts in the following discipline areas would likely be less than significant for reconductoring projects (some with implementation of standard mitigation measures, such as fugitive dust control to control emissions of particulate matter during construction, for example):

- Air Quality
- Facility Design
- Hazardous Materials Management
- Power Plant Efficiency
- Power Plant Reliability
- Public Health
- Worker Safety
- Socioeconomic Resources
- Waste Management
- Worker Safety

The disciplines where potential impacts reconductoring are of most concern are biological resources, cultural resources, and traffic & transportation. The conclusions of these analyses are described below.

Biological Resources: Because it appears some of the reconductoring work would occur in or near sensitive species and/or habitats, staff concludes that reconductoring the East Shore-San Mateo line could adversely impact sensitive biological resources in and/or adjacent to the transmission line corridor. Impact avoidance measures discussed in Calpine's Environmental Assessment (Calpine 2002) could help reduce potentially significant biological impacts to less than significant levels. However, in the unlikely event that new tower foundations are required, habitat disturbances could be permanent in nature. Staff recommends that after construction plans are finalized, a complete project description (including wetland delineations, results of all sensitive species surveys, and a revised assessment of potential impacts) be submitted to the project's lead agency, which would ensure the reconductoring complies with applicable Federal, State and local laws, ordinances and regulations. Staff also recommends consultation with the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corp of Engineers, Regional Water Quality Control Board and the Bay Conservation and Development Commission to identify potential impacts and develop mitigation measures that would avoid, eliminate, reduce to a less-than-significant level or compensate for those impacts. Therefore, if the reconductoring work complies with all applicable LORS, mitigation measures proposed by the Applicant are implemented, and standard Best Management Practices for construction activities are employed, the reconductoring of the East Shore-San Mateo line would not likely create significant impacts to Biological Resources.

Cultural Resources: Staff agrees with the Applicant's recommendation that an archaeological and historic survey be conducted after the major work areas associated with the reconductoring project are identified. If sensitive archaeological or historic resources are identified, the Applicant and the lead agency should conduct a preconstruction assessment and develop a training program. In addition, excavation (if any), pulling and tensioning, modifying towers, and other key project activities taking place within archaeological sites should be monitored. If cultural material is identified, the construction should be halted until the find can be evaluated. Staff recommends that after the construction area has been identified and after the cultural resources surveys are completed that archaeological sites be evaluated for eligibility for listing in the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR). Data recovery should be conducted as a mitigation measure for archaeological sites that are recommended as eligible to the CRHR or NRHP and would be impacted by the project. The Native American Heritage Council would need to be contacted to determine whether there are any Native American sacred sites in the vicinity of the work. The proposed reconductoring route is sensitive for cultural resources, and it is likely that some of the resources will be impacted as a result of the reconductoring effort. However, it appears that it will be possible to mitigate all impacts to cultural resources to less than a significant level.

Traffic and Transportation: Though only about 20 workers and 10-12 vehicles would be involved in reconductoring the East Shore-San Mateo line, the main roadway nearby, State Route 92, is at a very low level service rating, and any addition of traffic to those roadways during peak commute times could result in an adverse effect. In order to mitigate potential impacts of the reconductoring project on the surrounding roadway system, the work crews involved should avoid adding any vehicles to SR 92 during peak travel times by using off-site (i.e.

off of SR 92) facilities for reconductoring staging and laydown, non-peak hour scheduling, and workers carpooling to the job site. Finally, installation of protective structures as a safety precaution would reduce the potential for construction materials falling on motorists, bicyclists, or pedestrians during the tensioning/cable pulling process. Implementation of these mitigation measures would likely ensure that any potential impacts of the reconductoring project to traffic and transportation will be insignificant.

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KFAX RADIO TOWER RELOCATION ENVIRONMENTAL ANALYSIS

INTRODUCTION

The Russell City Energy Center (RCEC) project description as submitted in the Application for Certification (AFC) did not include the relocation of four radio transmission towers for the station KFAX, which currently occupy the western portion of the project site. On May 24, 2001, the City of Hayward granted a Conditional Use Permit (CUP) for the relocation of the KFAX towers from the RCEC project site to a site owned by the City and approved a Mitigated Negative Declaration. The tower relocation also requires approvals from the Federal Aviation Administration (FAA) and the Federal Communication Commission (FCC). Applications were filed by the station owner, Golden Gate Broadcasting Company, to the FAA on July 6, 2001 and to the FCC on August 16, 2001. A determination of No Hazard to Air Navigation was issued by the FAA on January 17, 2002. FAA approval of the proposed tower height is required by the FCC for the evaluation of health, safety, environmental, and communications systems impact protections.

The Energy Commission has no approval authority related to the relocation of the radio towers. However, because the relocation of the towers is being undertaken to make way for the power plant project, the radio tower relocation is part of the "whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change" (CEQA Guidelines Section 15378). It is therefore assessed here for its environmental impacts.

The following sections describe the project and potential environmental issues associated with the tower relocation. The staff has reviewed the City of Hayward's Initial Study and Mitigated Negative Declaration, correspondence from the East Bay Regional Parks District, and project information supplied by the RCEC Applicant (Calpine/Bechtel) and Golden Gate Broadcasting Company to focus the analysis on potential issues of concern.

The City, in its review, identified multiple conditions (19) to address potential issues of concern. In addition, the radio tower project will be subject to the requirements of a number of agencies (Regional Water Quality Control Board, FAA, and FCC, at a minimum) and has been reviewed by a number of additional agencies.

PROJECT DESCRIPTION

The KFAX-AM radio station transmitter currently located at 3636 Enterprise Avenue will be taken down and removed to enable construction of the RCEC project on the site. The existing transmitter will be replaced by a new 50,000-watt transmitter, constructed on the eastern panhandle of the City of Hayward's Old West Winton landfill approximately 1.25 miles northwest of the RCEC project site **(Project Description Figure 1)**. Four 228-foot-high (above ground) self-supporting AM radio transmitter towers and associated transmitter facilities will occupy approximately 14 acres at the

new site (see **Project Description Figure 2).** While the existing towers are supported by "guy" wires, the proposed new towers will be self-supporting monopoles. The radio tower relocation site is located adjacent to the parking lot and trailhead for trails to the bay shore and Hayward Regional Park. East Bay Regional Parks District (EBRPD) Headquarters are a short distance away. The towers are approximately 1.3 miles from the nearest runway at the Hayward Municipal Airport.

BIOLOGICAL RESOURCES

Before construction of the proposed RCEC can begin, four radio transmission towers owned by radio station KFAX must be removed and replacement towers constructed. Four small support buildings, to be located at the base of each tower, have also been proposed. Acting as the lead agency for the project, the City of Hayward conducted an Initial Study to assess the environmental impacts associated with tower removal and relocation. Based on the results of their Initial Study, the City of Hayward found bird collisions with the radio transmission towers to be a potentially significant impact and a Mitigated Negative Declaration was prepared.

SETTING

The proposed location for the KFAX radio towers is located at the end of West Winton Avenue. The proposed site is approximately 1.2 miles from the present location off Enterprise Avenue. The parcel is owned by the City of Hayward and is the location of the old West Winton Landfill. To the south of the proposed site are sewage treatment settling ponds once used by the City of Hayward for wastewater treatment. These ponds are now used for loafing and foraging by a variety of waterfowl and shorebirds such as the Canada goose (*Branta canadensis*), northern shoveler (*Anas clypeata*), mallard (*Anas platyrhynchos*), ruddy duck (*Oxyura jamaicensis*), black-necked stilt (*Himantopus mexicanus*), and greater yellowlegs (*Tringa melanoleuca*). Bordering the northern and eastern edges of the site is a brackish slough, which drains into Hayward Landing. Beyond the slough, to the north, lie facilities occupied and maintained by the East Bay Regional Park District (EBRPD). These facilities include park offices, an EBRPD residence, visitor parking area, and trailhead. Further north, in close proximity to the proposed site, are the transmission facilities (including five radio transmission towers) of radio station KTCT. To the west lies the majority of the old West Winton Landfill. To the east are areas of commercial/industrial development.

Although the area is zoned industrial, open space areas dominate the landscape to the north, south, and west of the proposed site, and there are several wetland restoration projects in the area. The area is within the Pacific Flyway and is used by migratory birds. Sensitive vertebrate species utilizing habitats in the project area include the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*), the state and federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), California clapper rail (*Rallus obsoletus*) and California least tern (*Sterna antillarum browni*).

The proposed site will occupy 14 acres of the 40-acre former West Winton Avenue landfill. After closure, the landfill was covered with a clay cap to prevent water seepage into the landfill. To preserve the integrity of this cap, it was overlain with topsoil. The

site is flat on top, with an elevation of approximately 25 feet and sloping sides. Survey results submitted by Foster Wheeler (Foster Wheeler, 2001) and LSA Associates (LSA Associates, 2001) indicated no sensitive species were observed on the proposed project site. Energy Commission staff visited the site on November 7, 2001, and noted it had been recently disked. Vegetation was restricted to the sloping sides of the site and consisted mainly of coyote brush (*Baccharis pilularis*). No wildlife was observed. Fill material is added to the site periodically, and the site is disked and seeded on an annual basis for several reasons: (1) erosion control; (2) aesthetics; and (3) prevention of plants and animals from penetrating the cap. Prior to disking, surveys indicated on-site vegetation consisted of mainly non-native species such as Italian rye grass (*Lolium perenne*) and Mediterranean barley (*Hordeum marinum* ssp. *Gussoneanum*). Coyote brush was the only native species observed. Red-winged black birds (*Agelatus phoeniceus*), barn swallows (*Hirundo rusitca*), and Canada geese (*Branta canadensis*) were observed at the proposed site. Sensitive bird species observed near the site included: the California Department of Fish and Game (DFG) fully protected peregrine falcon (*Falco peregrinus*); federal and state species of concern Alameda song sparrow (*Melospiza melodia pusillula*); DFG fully protected California black rail (*Laterallus jamaicensis coturniculus*); state species of concern saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*); and the federal and state species of concern western burrowing owl (*Athene cunicularia*).

POTENTIAL IMPACTS

The U.S. Fish and Wildlife Service, California Department of Fish and Game, the Energy Commission, and EBRPD are concerned that permitting new projects in the proposed project area will provide new perch sites for avian predators of the salt marsh harvest mouse, California clapper rail, western snowy plover, and the California least tern. Bird collisions are also a concern. The conclusion reached in the City of Hayward Mitigated Negative Declaration was that relocation of the KFAX transmission facilities to the West Winton location would not result in significant impacts to sensitive species because:

- The distance between the towers and good salt marsh (harvest mouse, clapper rail) or mud flat (least tern) habitat is too great for the towers to serve as effective "perching points."
- The diagonal latticework of the towers would discourage raptor perching, partially because there are horizontal perches nearby.
- Mitigation measures would be incorporated to reduce the risk of bird collisions with radio towers.

Perch Sites

The present location of the KFAX radio transmission towers off Enterprise Avenue is within approximately one-quarter mile of salt marsh harvest mouse habitat and within approximately one-mile of other sensitive species habitat including the western snowy plover, California least tern, and the clapper rail. Within approximately one-quarter mile are black-crowned night heron (*Nycticorax nycticorax*) and snowy egret (*Egretta thula*) rookeries (considered sensitive by state of California). The distance from the proposed West Winton Avenue location to these same sensitive species habitats is over one-mile;

however, the proposed towers would be within approximately one-quarter mile of California black rail habitat.

Avian predators such as raptors and corvids have excellent vision, and relatively long distances would not necessarily preclude their use of the current or proposed towers as hunting perches; however, these distances would likely increase energetic costs associated with traversing long distances between perch sites and foraging areas. Habitats near the existing towers support a greater diversity of sensitive species than habitats near the proposed tower location. Although avian predators could use towers at the proposed location as perch sites from which to locate and hunt sensitive species, it is staff's opinion that there are greater opportunities for avian predators to locate and take sensitive species at the current site. Staff concludes that construction of new towers at the proposed site would probably not result in a significant increase in predation of sensitive species by raptors using the proposed towers as perch sites.

For birds, perching on diagonal latticework towers possibly is more difficult and a less desirable alternative than perching on horizontal structures. However, on a November 7, 2001 site visit to the proposed West Winton Avenue location, staff observed an American crow (*Corvus brachyrhynchos*) perched in a diagonal latticework transmission tower (Itoga, pers. obs.) belonging to radio station KTCT (transmission facilities of station KTCT are adjacent to the proposed site). It seems likely that other birds (including raptors) could also use the KTCT towers as perch sites. Furthermore, the KFAX towers (in their present location) could serve as perch sites for birds and could continue to do so at the proposed relocation site. The use of diagonal lattice towers could deter some birds from using them for perching; however, it is staff's opinion that replacing diagonal latticework towers at the existing site, with new diagonal latticework towers at the proposed location, would not significantly increase the number of perch sites in the project area.

In Conditions of Approval, Use Permit Application 01-160-11 (City of Hayward, 2001), Condition #5 states: "horizontal elements which may extend out from the radio transmission towers, such as to support light fixtures or the fixtures themselves, shall be designed to deter raptors from perching on them." Staff is in agreement with the need for this condition, but would modify Condition #10 (City of Hayward, 2001), which states: "Fencing shall consist of decorative metal fencing (such as wrought iron or tubular metal) which shall be installed and maintained in a damage free condition around each radio tower." Such fencing could provide new perching opportunities for raptors and therefore should be designed to deter raptors from perching.

Bird Collisions

The City of Hayward has indicated that the proposed towers will extend to an elevation of approximately 260 feet (228 feet plus 30 feet base elevation). Further, as stated in Use Permit Application 01-160-11, Conditions of Approval (City of Hayward, 2001): "guy wires will not be used; security lighting at the transmission facilities will be directed downward; structures will be non-reflective; and no red, aircraft warning lights will be used." It is staff's opinion that these measures would have helped reduce the potential for bird collisions with the proposed towers. However, the FAA, in a recent communication to Golden Gate Broadcasting (FAA 2002), indicated that they would require red, aircraft warning lights and the towers be painted with alternating orange and

white bands. Further, it appears that the paint required by the FAA is high gloss (Knight 2002).

Some literature indicates (Cochran and Grabber, 1958; Herbert, 1970; Heye, 1963; Kemper, 1964; Olsen and Olsen, 1980) that bird collisions are usually associated with:

- towers taller than 1,000 feet (usually taller than 2,000 feet)
- periods of inclement weather (heavy rain/fog) or darkness
- guy wires supporting the towers, not the towers themselves
- towers equipped with red, steady or pulsating warning lights
- brightly lit or highly reflective structures

Staff believes the projected elevation for the towers seems somewhat low to be a significant collision hazard as most communication towers associated with bird collisions are considerably taller. In addition, guy wires, which support the existing towers, and are considered to be the greatest collision risk for birds, will not be used with the new towers. Furthermore, existing towers with supporting guy wires will be removed.

The proposed site would place towers closer to wetlands and the Hayward Shoreline and could place towers in the flight paths of birds traversing wetlands and shorelines in the project area. Painting the proposed towers with alternating orange and white bands might increase tower visibility during daylight hours (Maehr et. al. 1983). However, most collisions occur at night, or during adverse weather conditions, and use of high gloss paints and steady or pulsating, red warning lights on the proposed towers could attract night-migrating birds. Birds attracted to the lights, or light reflected from high gloss paints, could become disoriented and collide with the towers (Hebert and Reese 1995).

Staff concludes that guy wires supporting existing towers are the greatest collision hazard to birds in the area. Guy wires can be difficult for birds to detect, and replacement of guy wire supported towers with self-supporting towers should significantly decrease the potential for bird collisions in the area. However, it is possible that use of red, steady or pulsating warning lights, and high gloss paints, could increase the potential for night-migrating bird collisions with the proposed towers.

Burrowing Owl and Sensitive Plants

EBRPD has described the burrowing owl as a casual species (seen more than four times since 1983), but less often than rare (seen at least every two years), known to occur in the proposed project area (Taylor, 2001). Suitable burrowing owl habitat exists in the project area and on the proposed site. However, the proposed towers will occupy a relatively small portion of the 14-acre site. It is staff's opinion that use of the site for radio transmission towers, and associated facilities, would not significantly affect the site's potential to provide habitat for burrowing owls.

The San Francisco Bay Regional Water Quality Control Board (RWQCB) is concerned that disking of the site increases the amount of particulate matter in the site's stormwater runoff. To address this concern, the RWQCB is preparing a Notice of Violation prohibiting the City of Hayward from further disking of the site (Ganguli, 2001).

This notice would also require the City of Hayward to use an alternative to disking. Mowing of on-site vegetation would be the likely alternative. Surveys conducted by LSA Associates (2001) indicated two California ground squirrel (*Spermophilus beecheyi*) burrows were observed during June 2001 surveys, and numerous ground squirrels were observed by Energy Commission staff in areas adjacent to the proposed site (Itoga pers. obs). Burrowing owls often use ground squirrel burrows for roosting and nesting (California Department of Fish and Game, 1990), and a greater abundance of ground squirrel burrows on the proposed site could provide microhabitat for burrowing owls. Staff concludes that termination of on-site disking could increase the potential of the site to support burrowing owls.

EBRPD has expressed concern over possible impacts to sensitive plants that may occur in the project area. Sensitive plant species with potential to occur in the proposed project area include: Alkali milk-vetch (*Astragalus tener* var. *tener*), hispid bird's beak (*Cordylanthus mollis* ssp. *Hispidus*), Point Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), hairless popcorn flower (*Plagiobothrys glaber*) and California seablite (*Suaeda californica*). Species-specific sensitive plant surveys were conducted by Foster Wheeler on February 27, March 25, and April 24, 2001 and by LSA Associates on June 5, 2001. No sensitive plant species were reported. It is staff's opinion that suitable sensitive plant habitat (suitable soil type) does not exist on the proposed project site and that sensitive plant surveys were conducted over a sufficient period of time to allow the identification of sensitive plants with the potential to occur in the area.

CONCLUSION

It is staff's opinion that replacing existing, guy wire supported, latticework towers with new, self-supporting diagonal latticework towers at the proposed West Winton site is not likely to significantly impact sensitive biological resources in the proposed project area. Although use of the site for radio tower relocation probably will not have a significant impact on sensitive biological resources, staff recognizes that facility and aircraft obstruction lighting, as well as light reflected from the towers, may attract some night-migrating birds. Birds attracted by the aforementioned lighting could collide with the towers. To minimize potential for bird collisions, staff recommends directing facility lighting down and away from open-space areas. Staff also recommends the use of white or red strobe lights for aviation obstruction lighting.

It is possible that termination of on-site disking may increase the site's potential to provide burrowing owl microhabitat, but use of the site for radio tower relocation probably will not have a significant impact on the site's potential to provide burrowing owl habitat. However, if burrowing owls are present, activities associated with construction of the new towers (e.g. pile driving, grading) could adversely impact (disturbance or harassment within 50 meters of occupied burrows, destruction of burrows and burrow entrances, degradation of foraging habitat adjacent to burrows) nesting/fledging burrowing owls. Pre-construction surveys for nesting burrowing owls should be conducted, by a qualified biologist, no more than 30 days prior to on-site ground disturbance activities. If surveys indicate burrowing owls are active on-site, staff

recommends consulting the California Department of Fish and Game before beginning any ground disturbing activities.

PUBLIC HEALTH, SAFETY AND NUISANCE

Staff has reviewed the City of Hayward's Initial Study and Mitigated Negative Declaration (July 10, 2001), a general environmental analysis prepared by Calpine (undated), and a more detailed assessment of health and safety impacts prepared by Foster Wheeler Environmental Corporation (June 21, 2001). Staff has found these documents to be scientifically accurate in their description of the state of knowledge about the biological effects of electromagnetic fields (EMF) and more specifically, radio frequency (RF) radiation.

Staff also conducted an independent search and review of published abstracts and articles in the scientific literature, focusing on the most recent articles from 1994 to the present. Most scientific research suggests that RF towers pose little to no risk to humans unless one actually climbs a tower and is within several feet of the transmitter. As part of relocation process, the owner must obtain a permit from the Federal Communications Commission (FCC) and as such, must comply with the FCC's rules regarding human exposure to RF radiation. These rules are designed to ensure that FCC-regulated transmitters do not expose the public or workers to levels of RF radiation that are considered by expert organizations to be potentially harmful (FCC OET Bulletin 56).

Below is a discussion of the basis for staff's finding.

ELECTROMAGNETIC SPECTRUM

Electromagnetic radiation can be described as a series of waves of energy composed of oscillating electric and magnetic fields that travel through space at the speed of light. The electromagnetic spectrum is a continuum of different electromagnetic radiation energies that are listed from longest to shortest wavelength (lowest to highest energy and frequency). Power lines (standard electrical power distribution) operate at a frequency of 60 Hz and a wavelength greater than 10^6 meters. RF radiation is in the range of 300 Hz - 300 MHz and includes frequencies of CB, cordless, cellular and PCS phones. AM radio has a frequency of around 1 MHz, FM radio has a frequency of around 100 MHz, microwave ovens have a frequency of 2450 MHz, and X-rays have frequencies above one million MHz. Cellular (mobile) phones operate at a variety of frequencies between about 800-2200 MHz.

Power line and radio frequencies occur in the non-ionizing radiation part of the electromagnetic spectrum where the energy of the particles is much too low to break chemical bonds. UV and X-rays occur in the ionizing part, where broken bonds and DNA damage can occur as a result of exposure to these energy forms.

HEALTH EFFECTS OF RADIO-FREQUENCY RADIATION

Mobile phones and their base stations produce radio-frequency radiation. The consensus of the scientific community is that the power from mobile phone base station antennas is too low to produce health hazards as long as people are kept away from

direct access to the antennas (Moulder, 2001a). It is unlikely that RF radiation has a strong causal influence on cancer based on the lack of association shown between exposure to RF radiation and total cancer and the lack of consistent associations shown between exposure to RF radiation and any specific type of cancer (Moulder, 2001a).

Seven of 35 literature abstracts on radio frequency radiation chosen for further review from an extensive literature search are summarized in Table 1. Four of these studies presented reviews of the scientific literature and concluded that there was no conclusive evidence that radio frequency radiation can be linked with cancers or reproductive effects. One report identified an excess risk for breast cancer in female Norwegian radio and telegraph operators. Health effects have been observed in animals exposed to RF radiation when the exposure has caused an increase in the organism's temperature; however, RF radiation from this project are unlikely to cause temperature increases.

Table 1
Results of Review of RF Abstracts

#	Year	Type of Study		Type of EMF	Conclusions	Association (+/-)
1	1999	Review of Sci Literature	Repro	RF	Gross developmental anomalies were associated with significant increases above normal in embryonic or fetal temp; there is no convincing independently verified evidence that exposures to RFR from current mobile telecommunications technology presents a serious health risk to human prenatal development	-
2	1996	Human Epi Study	Cancer	RF 405kHz-25MHz	Excess risk seen for breast cancer in Norwegian radio and telegraph operators	+
21	1998	Review of Sci Literature	Cancer	RF	RF fields, mobile telephone frequencies in particular, are not genotoxic, do not seem to be teratogenic or to induce cancer	-
23	1998	Review of Sci Literature	Cancer	RF 10 MHz-300GHz	No known health hazards were associated with exposure to RF sources emitting fields too low to cause a significant temperature rise in tissue	-
26	1999	Rat Study	CV	RF 94 GHz	Extreme peripheral heating occurred without similar levels of core heating	-
34	2000	Rat Study	CNS	RF 900 MHz	In-utero exposure did not induce any measurable cognitive deficits	-
36	1999	Review of Sci Literature	Cancer	RF	The epidemiologic evidence falls short of the strength and consistency of evidence that is required to come to a reasonable conclusion that RF emissions are a likely cause of one or more types of human cancer	-

HEALTH EFFECTS OF POWER LINES

Although the proposed relocation of the towers does not involve power lines (which emit at a very different frequency than radio towers), health information is provided on power lines since there is often confusion among the general public regarding these types of emissions. Power lines produce no significant non-ionizing radiation; they produce electric and magnetic fields. In contrast to non-ionizing radiation, these fields do not radiate energy into space, and they cease to exist when power is turned off. It is not clear how, or even if, power line fields produce biological effects; but if they do, it is not in the same way that higher power RF radiation produces biological effects. There

appears to be no similarity between the biological effects of power line "EMF" and the biological effects of RF radiation (Moulder, 2001b).

According to Moulder, some studies appear to show a weak association between exposure to power-frequency magnetic fields and the incidence of cancer. However, epidemiological studies done in recent years show little evidence that power lines are associated with an increase in cancer, laboratory studies have shown little evidence of a link between power-frequency fields and cancer, and a connection between power line fields and cancer remains biophysically implausible (Moulder, 2001b).

Reviews conducted by the U.S. National Academy of Science, the U.S. National Institutes of Health, and the U.K. National Radiation Protection Board have concluded that conclusive evidence does not exist linking power-frequency EMF or extremely low frequency EMF to cancer or other health effects (Moulder, 2001b).

Following six years of Congressionally mandated research, the NIEHS published a report in 1999, which stated that the scientific evidence suggesting that power-frequency EMF exposures pose any health risk is "weak" (NIEHS, 1999). The report applies to extremely low frequency electric and magnetic fields surrounding both the big power lines that distribute power, as well as the smaller but closer electric lines in homes and appliances. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. Epidemiological studies demonstrate (for some methods of measuring exposure) a fairly consistent pattern of a small increased risk with increasing exposure that is somewhat weaker for chronic lymphocytic leukemia than for childhood leukemia. NIEHS also found inadequate evidence of any link to such non-cancer diseases as Alzheimer's, depression, and birth defects. The NIEHS report also recommends that the fields continue to be recognized as a "possible" cancer hazard, but emphasizes the weakness of the data and the low risk that may be involved.

Overall, most scientists consider the evidence that power line fields cause or contribute to cancer to be weak. Laboratory evidence does not suggest a link between power-frequency magnetic fields and cancer.

NUISANCE EFFECTS OF RADIO-FREQUENCY RADIATION

RF radiation may potentially interfere with telecommunications and other equipment in the near vicinity (typically within a few hundred yards) of the proposed relocation site. Potential effects would most likely be within the one volt per meter contour (**Public Health, Safety and Nuisance Figure 1**). Potential interference may not be identifiable until the towers are in a test or operational mode. The owner of the towers is required by the FCC to mitigate all interference within the one volt per meter contour. In addition, the tower owner has indicated that they have a "good neighbor" policy at all their radio tower locations and will rectify any problems that arise.

The East Bay Regional Parks District and local businesses at the end of West Winton Avenue have expressed concern about the potential for interference with selected equipment. The City of Hayward has imposed Conditions of Approval on the tower

relocation which include the requirement for the owner to respond to and address all complaints regarding RF interference as required by FCC regulations and to maintain records of all such notices or correspondence. In order to preempt any potential issues or concerns, Calpine and Golden Gate Broadcasting Company have met with local businesses and the Parks District to identify what, if any, potential interferences could arise. No major compliance problems were identified.

CONCLUSION

Based on a review of the scientific data, staff concludes that radio frequency emissions from the KFAX towers pose little or no risk to humans. The towers will be fenced to preclude exposure and will be subject to FCC rules designed to avoid human exposure to RF radiation. The potential for nuisance impacts to equipment will be reduced by: ongoing meetings between Golden Gate Broadcasting and nearby entities; by requirements of the FCC; and by the "good neighbor" commitment of Golden Gate Broadcasting.

GEOLOGY AND PALEONTOLOGY

INTRODUCTION

The new KFAX Radio transmitter facilities will be located on the northern panhandle of the Old West Winton Landfill. The entire site is mantled by more than 20 feet of fill, including cover material and landfill debris. The foundations for the new radio transmitter facilities would be constructed by driving piles through the landfill and into the underlying bay deposits.

Younger bay mud deposits underlie the landfill. The younger bay mud typically consists of plastic, organic-rich clay and silty clay, with interbedded thin beds of sorted silt, sand, and fine gravel. The Applicant speculates that the young Bay mud may be between 20 and 60 feet thick beneath the landfill, and that it is underlain by more consolidated older Bay mud deposits. Young Bay mud deposits beneath the City of Hayward's Wastewater Treatment Plant, immediately east of the landfill, are generally less than 15 feet thick (Cooper Clark and Associates, 1959 and 1972).

GEOLOGIC HAZARDS

Faulting and Seismicity

No active or potentially active faults are known to cross the proposed radio transmitter facilities site. The closest known active fault is the Hayward fault, which is located five kilometers east of the project site. Therefore, the potential for fault rupture beneath the facilities is considered to be very low.

The ground shaking impacts at the proposed site are similar to the impacts at the RCEC site. The California Division of Mines and Geology (CDMG) Map Sheet 48 (Petersen et al., 1996) predicts a peak ground acceleration with a 10 percent probability of exceedance in 50 years of between 0.5 and 0.7g for the project area. However, since the site will overlie younger Bay mud (CBC Soil Profile Type S_f), the site will likely

experience amplification of seismic shaking and potential liquefaction during an earthquake.

Liquefaction, Hydrocompaction, and Expansive Soils

The combination of saturated soils of varying density and a potential for a moderately high peak horizontal ground acceleration points to a moderate potential for liquefaction at the site. Potentially liquefiable soils are expected to occur in the bay deposits beneath the landfill. Localized subsidence due to seismically induced densification of loose granular zones of fill is considered the most likely expression of liquefaction at the project site. However, liquefaction beneath the landfill may also lead to lateral spreading. This conclusion is supported by the findings of a geotechnical investigation at the City of Hayward's Wastewater Treatment Plant (Judd Hill and Associates, 1979). Liquefaction will be accounted for during the final design of the project's foundation by the Applicant's proposed use of pile foundations driven through any potentially liquefiable zones and into the older Bay mud.

Landslides

Landsliding potential at the radio transmitter site is considered to be low, since the project is located on a fill pad with relatively gentle slopes.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

The Old West Winton landfill does not contain any geological or paleontological resources since, as a landfill, it received only waste materials.

CONCLUSION

The Applicant will likely be able to comply with applicable laws, ordinances, regulations and standards (LORS). The project should have no adverse impact with respect to geologic and paleontologic resources if it complies with these LORS.

Design and construction of the project to conform to applicable California Building Code (1998) requirements outlined and the standards adopted by the City of Hayward Public Works Department will reduce the impacts of strong seismic ground shaking, liquefaction, and lateral spreading to less than significant.

SOILS, HYDROLOGY AND WATER QUALITY

SETTING

The relocation of the KFAX Radio towers will occur on a 14-acre site consisting of the Old Winton Landfill, located in the bayshore floodplain in the southern part of the City of Hayward in Alameda County. The landfill, which operated from 1939 – 1974, raised the elevation of this parcel of land by 25 to 30 feet above neighboring properties of bayshore floodplain, and was closed after 1974. Closure activities included placement of a clay cap and protective soil layer over the surface of the landfill, to prevent precipitation from infiltrating into the landfill. Construction of the four monopole type towers will consist of driving piles through the soil and clay surface layer, through the landfill zone, and into the bay mud consisting of Reyes Clay. A concrete foundation near the ground surface will tie-into the deep driven piles and provide the base support

for the free-standing lattice towers, which develops a system that avoids the need to require guy wires for tower support. The four towers will be approximately 228 feet high. A ground wire system will also be installed as part of the electrical system protection. The type of grounding system and its design is unspecified. Associated transmitter facilities will be constructed on the site. A previously conducted Environmental Site Assessment (ESA) revealed two materially recognized conditions of concern:

- Potential for on-site soil and groundwater contamination due to landfill use at the site;
- Volatile Organic Compounds (VOC's) were detected above the reporting limit in leachate return samples;

STORM WATER

In planning for construction, a General NPDES Permit for Discharge of Storm Water Associated with Construction Activity would not normally be considered necessary if the extent of land disturbance is less than 5 acres. However, because the land disturbance is being conducted on a closed landfill, the potential for water quality impairment from storm water runoff is greater, and the RWQCB should be consulted as to whether an NPDES Permit for construction activity is necessary in this particular case. Excavation for the tower foundations will disturb the existing soil cover and clay cap on the surface of the landfill, exposing the landfill to surface water infiltration or creating potential for contaminated runoff from direct contact of storm water with landfill material or leachate. In addition, placement of the piles through the landfill zone and into the bay mud will penetrate any seal developed between the two, and potentially develop a conduit for transfer of leachate into the bay mud and groundwater, or else a means for groundwater to surcharge the landfill under flood or high tidal conditions. Best Management Practices (BMPs) specified under a Storm Water Pollution Prevention Plan (SWPPP) would avoid such exposure and potential effects to water quality. The ESA has identified the potential for soil and groundwater contamination from the landfill, and in particular, the leachate within the landfill has been tested to confirm VOCs higher than the reporting limit. The potential for contamination to soil, groundwater or surface water exists, and would be avoided by including proper BMPs during the course of construction.

In planning and performing modifications to the closed landfill, staff recommends that the Integrated Waste Management Board be consulted regarding planned disturbance to the soil and clay cap over the surface of the landfill, and the San Francisco Bay RWQCB be consulted regarding planned disturbance to the landfill/bay mud interface. Consultations should address potential impacts from all phases of planned construction disturbing the surface protection and/or landfill zone, and should include effects from the tower foundations, ground wire system, and the associated transmitter facilities. In addition, the SWPPP associated with storm water management should include an Erosion Control and Sedimentation Plan with specific BMPs listed and shown on a site plan. A Drainage Plan is required to be submitted to the City of Hayward.

For activities during construction and during operations of the radio transmitter, the San Francisco Bay RWQCB should be consulted as to whether storm water should be

managed under an NPDES Permit. Although the RWQCB terminated coverage for the site under the General Permit for Industrial Activity approximately five years ago, new disturbance to the site for construction of the radio towers may initiate interest for ongoing management and monitoring oversight of storm water by the RWQCB considering the potential for water quality degradation from the landfill.

CONCLUSION

The proposed relocation of the KFAX radio towers should have no significant adverse impact to soils and water resources subject to implementation of BMP's and conditions specified by the San Francisco Bay RWQCB, Integrated Waste Management Board, and City of Hayward.

LAND USE

In evaluating whether a project has the potential to result in significant impacts related to land use and planning, Energy Commission staff uses the criteria presented in Appendix G of the CEQA Guidelines, which are the same criteria utilized by the City of Hayward in evaluating the potential impacts of the relocation of the KFAX radio towers. Each of these criteria is discussed below.

The first significance criteria for land use considers whether a project would "physically divide an established community." Typically, a project considered capable of dividing a community would consist of a substantial linear physical barrier, such as a freeway or a large flood control channel. The radio towers do not represent such a potential barrier. Also, location is an important consideration in the potential to divide an established community. Projects located at the periphery of a community, such as the proposed radio tower site, have little potential to physically divide the community. As a result, staff agrees with the City's determination that the relocation of the radio towers would not physically divide the community.

The second significance criteria for land use considers whether a project would conflict with applicable land use plans, policies, or regulations that have been adopted for the purpose of avoiding or mitigating an environmental effect. The City of Hayward is the agency with land use jurisdiction over the radio tower relocation. Therefore, it is the City's General Plan and zoning regulations that must be evaluated. The proposed relocation site is located in an area designated for Industrial and Open Space uses by the Hayward General Plan. The City determined that the radio towers are an appropriate use for an Industrial area. The City also determined that the radio towers would be appropriate in an area designated Open Space because such uses are not specifically precluded in such an area by the General Plan and due to the precedent of allowing similar uses in Open Space areas. The proposed relocation site is located across two zoning districts: the Industrial District and the Flood Plain District. The City determined that their zoning regulations would allow radio broadcast facilities in these zones with the approval of a CUP. The Hayward City Council approved a CUP in July 2001 allowing the KFAX radio towers and associated broadcast facilities to be located on the proposed site. The CUP imposes 19 conditions of approval on the project. Staff finds the City's determination reasonable and finds no reason to dispute the City's

conclusions regarding the project's consistency with the its land use policies and regulations.

The third significance criteria for land use considers whether a project would conflict with any applicable habitat conservation plan or natural community conservation plan. There are no such plans in effect at the proposed site for the relocation of the KFAX radio towers. However, the planning area for the Hayward Area Shoreline Planning Program prepared by the Hayward Area Shoreline Planning Agency (HASPA) includes the radio tower relocation site. HASPA's purpose is long-range planning of the shoreline area and the enhancement and environmental restoration of wetlands in public ownership near the shoreline. HASPA is an advisory body in land use matters and does not have land use authority over the project or the project site. The radio tower relocation site is located in an area that is targeted for possible upland habitat restoration in the Hayward Area Shoreline Planning Program. In reviewing the Hayward Area Shoreline Planning Program, staff did not identify any specific policies or statements that represented a direct conflict between the radio tower relocation project and the Planning Program. However, staff acknowledges that the installation of the radio towers would not be ideal considering the general intent of the Hayward Area Shoreline Planning Program to enhance the habitat and recreational values of the area. Please see the discussions of **Biological Resources** and **Visual Resources**.

In preparing the Mitigated Negative Declaration for CUP for the KFAX radio tower relocation, the City of Hayward determined that the San Francisco Bay Conservation and Development Commission (BCDC) did not have jurisdiction over the project due the fact that the project site was located outside the BCDC's jurisdictional shoreline band that extends 100 feet inland from the line of highest tidal action along the Bay, and that the site is not influenced by tidal action due to its elevation.

CONCLUSION

The construction of new radio transmission towers at the approved City-owned site would not create a physical barrier capable of dividing the community and would not violate applicable land use plans, policies, or regulations. The installation of the radio towers at the approved location would not be ideal considering the general intent of the Hayward Area Shoreline Planning Program; however, staff did not identify any specific conflicts between the radio tower relocation project and the Planning Program.

TRAFFIC AND TRANSPORTATION

Construction of the new KFAX radio towers will take approximately 12 to 16 weeks to complete. The peak traffic generation from radio transmitter construction will occur between weeks 5 and 14, with approximately 18 vehicle trips per day and 3 vehicle trips during both morning and evening peak hour conditions. After completion of the new radio tower, there will not be regular daily traffic, with only occasional site visits by maintenance personnel (on average, a few trips per week during non-peak hour conditions). Therefore, project generated traffic will not cause any significant changes in either local or regional traffic conditions and would result in a less than significant impact.

The movement of equipment necessary to erect the new KFAX radio tower may cause short-term inconveniences to users of the Hayward Shoreline Regional Park and its trailhead parking lot. However, the Applicant will implement standard construction practices to minimize such effects, thereby resulting in a less than significant impact.

The construction of the new radio towers will require a Federal Aviation Administration (FAA) permit since the project site is located 4,900 feet from the nearest runway to the Hayward Executive Airport and could affect air traffic approaching Oakland International Airport. The FAA will conduct an airspace analysis and impose conditions to ensure that the new towers will not result in significant impacts to aviation safety.

CONCLUSION

The new KFAX radio towers are not expected to create significant traffic or aviation safety impacts.

VISUAL RESOURCES

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the relocation of the four KFAX radio towers (project) currently occupying the proposed Russell City Energy Center (RCEC) site would cause visual impacts. The determination of the potential for visual impacts resulting from the proposed project is required by the California Environmental Quality Act (CEQA).

PROJECT DESCRIPTION

The following section describes the aspects of the proposed project that may have the potential to cause adverse impacts to visual resources.

Radio Transmitters

The four radio towers would be self-supporting, 228-foot-tall lattice steel structures. The towers would be 6.5-feet square at the base and taper up to a point at the top.

Ancillary Equipment

A transmitter equipment enclosure and small electronics enclosure would be located at the base of each radio tower.

Lighting

Aircraft warning lights would be required to alert aircraft of the location of the radio towers. Exterior lighting for operational safety and security would be required at the transmitter buildings.

SETTING

Regional Setting

The proposed radio towers would be located in the City of Hayward along the east shore of San Francisco Bay within an area referred to as the "baylands." The regional setting of the project includes the East Bay Hills to the north and east and San Francisco Bay to the west. The surrounding baylands constitute a vast open space area that includes saltwater, brackish, and fresh water marshlands and mudflats supporting stands of tall cord grass. Much of the area in the baylands is managed for wildlife protection and public access (Hayward Regional Shoreline) by the East Bay Regional Park District (EBRPD) and the Hayward Area Recreation and Park District (HARD). Visitor facilities include the Hayward Shoreline Interpretive Center (managed by HARD), located on Breakwater Avenue immediately north of State Route 92, and a system of trails through the area, including a portion of the San Francisco Bay Trail. The Hayward Shoreline Interpretive Center and the trail system provide highly scenic vista views of San Francisco Bay, the Coast Range, the baylands, and the East Bay Hills.

Project Area Setting

The radio towers now located on the proposed RCEC site would be relocated to a 14-acre piece of land located over 1 mile to the northwest at the western end of West Winton Avenue. The proposed site is located immediately south of the parking area and entrance to the Hayward Regional Shoreline trail system. **Visual Resources Figure 1** shows the location of the project relative to the entrance to the Hayward Regional Shoreline. The project site is a small portion of the former West Winton Avenue Landfill, which was operated until 1974. The landfill is now capped and revegetated, and appears as a large 25- to 30-foot tall mound with a flat top (Calpine/Bechtel, 2001). There are small trees growing along portions of the base of the mound and on its sides. The earth on top of the landfill is disked yearly to prevent plants from compromising the integrity of the clay cap, and then seeded yearly with grasses to prevent erosion. The site is in close proximity to several segments of the shoreline trail (see **Visual Resources Figure 1**). Although the landfill is not part of the trail system, it is currently accessible to the public and provides a viewing point for the surrounding area (City of Hayward, 2001a). Except for the fenced areas around the base of the proposed towers, the area would continue to be accessible to the public. From atop the elevated landfill, San Francisco Bay, oxidation lagoons for the Hayward Water Pollution Control Facility, and the Hayward Industrial Corridor are visible. Visible to the north approximately 0.3 mile north of the site are the five, KTCT radio towers that are located on the closed All Cities Landfill.

VIEW AREAS AND KEY OBSERVATION POINTS

Calpine/Bechtel selected three key observation points (KOPs) to characterize the existing visual setting within which the proposed project would be evaluated. **Visual Resources Figure 1** shows the location and view direction of the three KOPs. The following discussion provides an assessment of the overall visual sensitivity at each KOP. Overall visual sensitivity takes into account existing landscape visual quality,

viewer concern, and overall viewer exposure, which considers visibility, distance zone, number of viewers, and duration of view.

KOP 1: West Winton Avenue

KOP 1 was established at a viewpoint along West Winton Avenue approximately 1,000 feet northeast of the proposed radio tower site. This view was selected to represent views of the site available to the public as they drive along West Winton Avenue toward the entrance to the Hayward Regional Shoreline. On an average day, 200 to 250 people visit the shoreline area for hiking, biking, jogging, dog walking, bird watching, and fishing (Calpine/Bechtel, 2001). Based on a field observation, the parking/trailhead staging area would also appear to be used as a location to enjoy a lunchtime break. **Visual Resources Figure 2** depicts the existing view of the project site from KOP 1. Visible in the view toward the site from KOP 1 are an open, grassy field, trees along West Winton Avenue, utility poles, cell tower, and electric transmission towers (not visible in the photograph). The shed-like structures in the center of the photograph are located in an EBRPD service yard. To the right of the large EBRPD shed is the trailhead to the San Francisco Bay Trail. The trailhead is located about 350 feet north of the nearest proposed radio tower. **Visual Resources Figure 3** shows other views toward the site in the area of KOP 1, including views from the park entrance and parking/staging area.

Visual Quality, Viewer Concern, and Viewer Exposure

Due to the presence of the utility poles and sheds, visual quality of views toward the site from KOP 1 is rated low to moderate. However, from the parking area the utility poles and sheds are screened by trees and shrubs, so visual quality of views from the parking area toward the site is rated moderate. Viewer concern is rated high because recreational users entering the Hayward Regional Shoreline primarily use the area. Viewer exposure would be moderate to high in spite of the low to moderate duration of view since the site is located in the near foreground distance zone, visibility of the towers would be high, and the number of potential viewers would be high.

Overall Visual Sensitivity

Although visual quality ranges from low to moderate to moderate, the overall visual sensitivity of the setting viewed from the area of KOP 1 is moderate to high primarily as a result of the high viewer concern and moderate to high viewer exposure.

KOP 2: Shoreline Trail at Cogswell Marsh Footbridge

KOP 2 was established at a viewpoint located on the Cogswell Marsh footbridge, located approximately 0.5 mile south of the relocated radio tower site. The existing KFAX radio towers are visible from this viewpoint in their present location about 1 mile to the east. KOP 2 was selected to represent views toward the relocated tower site available to the public using the trail system along the western edge of the Hayward Regional Shoreline. The trails in this portion of the shoreline are used by about 200 people daily (Calpine/Bechtel, 2001). **Visual Resources Figure 4** depicts the existing view toward the proposed site from KOP 2. Visible in the near foreground are the footbridge and Cogswell Marsh. In the middleground are mudflats, the capped landfill, and warehouses in the industrial area along Cabot Boulevard. Faintly detectable in the

left middleground are the existing KTCT radio towers. The East Bay Hills and Mt. Diablo are visible in the background.

Visual Quality, Viewer Concern, and Viewer Exposure

Although visual quality is reduced somewhat by the industrial structures in the middleground, the area provides views of the marsh, East Bay Hills, and Mt. Diablo. Visual quality is rated moderate to high. Because the area is used for recreation, viewer concern is high. The City of Hayward Use Permit Conditions of Approval require the relocated radio towers to be finished in a non-reflective, anodized metal color, unless otherwise directed by the FAA (Hayward 2001b). The Determination of No Hazard to Air Navigation issued by the FAA on January 17, 2002 requires the relocated towers, similar to the existing KFAX towers, to be painted in alternating orange and white bands to alert aircraft to their location[1]. Although the towers would have a slim profile, the white color bands as seen against the backdrop of the East Bay Hills and sky would increase their visibility. Therefore, the visibility of the towers would be moderate at middleground distances such as at the Cogswell Marsh footbridge (KOP 2). Because the visibility of the towers would be moderate, the number of viewers would be high, and the duration of view would be moderate, overall viewer exposure would be moderate.

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from the area of KOP 2 is moderate to high as a result of the moderate to high visual quality, high viewer concern, and moderate viewer exposure.

KOP 3: Shoreline Trail at Sulphur Creek

KOP 3 was established on the hiking and biking trail along the west side of the Hayward Regional Shoreline just north of the trail's crossing of Sulphur Creek, a viewpoint located about 1 mile to the northwest of the proposed radio tower site. The approximately 200 to 250 people who use this portion of the shoreline area for hiking, biking, jogging, bird watching, and fishing see this view of the site. **Visual Resources Figure 5** depicts the existing view toward the project site from KOP 3. Natural elements visible in the view include water in the foreground and the East Bay Hills in the background. Visible in the middleground are debris piles at the Landfill Management concrete recycling facility located on West Winton Avenue, the closed All Cities Landfill in the process of being capped, and the five KTCT radio towers.

Visual Quality, Viewer Concern, and Viewer Exposure

Although visual quality is reduced somewhat by the disturbed character of the middleground, visual quality is rated moderate to high. Because the KOP 3 area is used for recreation, viewer concern is high. Although the number of viewers would be

[1] On May 3, 2002, the tower proponent submitted an amended application to the FAA to request a change in the marking and lighting to allow for "dual medium intensity white strobes." The FAA circular identifies medium intensity flashing white lighting as an alternative to other methods of marking, such as the combination of red flashing lights and aviation orange and white paint, for structures less than 500 feet above ground level. Medium intensity flashing white obstruction lights may be used during the daytime and twilight with automatically selected reduced intensity for nighttime operation. If the FAA concurs with the request, a new Determination of No Hazard to Air Navigation would be issued.

high, overall viewer exposure would be moderate primarily because the moderate view duration and the moderate visibility of the towers given their slim profile and middleground distance from KOP 3 (about 0.85 mile).

Overall Visual Sensitivity

The overall visual sensitivity of the setting viewed from the area of KOP 3 is moderate to high as a result of the moderate to high visual quality, high viewer concern, and moderate viewer exposure.

IMPACTS ANALYSIS

Scenic Vistas

The Hayward Shoreline Interpretive Center and the Hayward Regional Shoreline trails provide highly scenic vista views of San Francisco Bay, the Coast Range, the baylands, the East Bay Hills, and Mt. Diablo. Views of the baylands and the East Bay Hills are available to eastbound motorists on SR 92 and the Hayward-San Mateo Bridge, which is formally recognized as a "gateway" in the General Plan. The four existing 228-foot tall KFAX radio towers are visible from SR 92, the Interpretive Center, and the shoreline in their current location. The Mitigated Negative Declaration prepared by the City of Hayward concluded that "...replacing [the existing KFAX radio towers] with new towers at another location that is similarly visible from the shoreline will not have a significant negative visual impact as viewed from strategic viewpoints." The relocated towers would be sited farther from the Interpretive Center and SR 92 than their present location, a beneficial impact. However, in the proposed location the towers would be adjacent to the entrance to the Hayward Regional Shoreline, and, from near foreground views from the parking area and trail, would cause a high level of contrast and dominance, resulting in a potentially significant impact on a scenic vista. This potential impact is discussed in more detail below under Visual Character or Quality.

Scenic Resources

There are no state-designated scenic highways within the project viewshed. Furthermore, the project would be located on a capped, former landfill that is disked and seeded yearly and contains no scenic resources such as trees, rock outcroppings, and historic buildings. Thus, the project would have no impact under this criterion.

Visual Character or Quality

KOP 1: West Winton Avenue

Visual Resources Figure 6 is a simulation of the radio towers, as they would be seen from West Winton Avenue, at a distance of about 1,000 feet. The proposed radio towers would be very noticeable at this foreground viewing distance. The towers would appear similar in form and line and apparent height to the utility poles and cell tower in the view from KOP 1. As viewed from the park entrance and parking area (**Figure 3**), where the existing structures would be either behind the viewers or screened by vegetation, the vertical form of the towers would contrast highly with the horizontal form of the landforms and irregular form of the vegetation. In addition, the towers would appear much taller than the trees, so scale contrast also would be high. The towers are depicted in a gray color in the simulation. However, the FAA Determination of No

Hazard to Air Navigation requires that the towers be painted in alternating orange and white bands. The alternating bands of orange and white would increase the visibility of the towers against the backdrop of the sky, causing high color contrast. As viewed from the park entrance and parking area, the radio towers would occupy a moderate part of the field of view. The towers would be highly prominent because they would be silhouetted against the sky, and due to their height and elevated position atop the landfill, the towers would loom over viewers as they enter the parking area and trailhead. Therefore, overall project dominance would be moderate to high. The towers would disrupt the skyline and would block a moderate portion of the sky. Since visual quality is rated moderate, the severity of view blockage would be considered low to moderate.

For near foreground views from the area of KOP 1, the project would cause moderate to high overall visual change. Placing the towers in the proposed location would give the impression that the Hayward Industrial Corridor, which viewers would have driven through to access the Hayward Regional Shoreline Park at West Winton Avenue, is encroaching on the shoreline open space. Considering the moderate to high overall visual sensitivity of the setting viewed from the area of KOP 1, the resulting visual impact would be significant.

KOP 2: Cogswell Marsh Footbridge

Visual Resources Figure 7 is a simulation of the radio towers, as they would be seen from KOP 2. While the vertical form of the towers would cause high contrast with the horizontal form of the landforms, their vertical form and straight line would appear similar to the form and line of the KTCT radio towers and electrical transmission towers. Because there are existing vertical elements visible in the view from KOP 2, the additional form and line contrast due to the project would be moderate. The white color bands on the towers would be noticeable against the backdrop of the East Bay Hills and sky, so color contrast would be moderate at this distance. The towers would appear much taller than the warehouses in the middleground and the East Bay Hills in the background, but similar in height to the KTCT towers, so scale contrast would be moderate. Although the towers would be somewhat prominent because they would be tall and skylined, at this distance their dominance would be reduced because they would occupy a very small part of the overall field of view. Thus, overall project dominance would be low to moderate. The towers would block a very minor portion of the sky, so the severity of view blockage would be low.

The overall visual change as viewed from the area of KOP 2 would be low to moderate. Combined with the moderate to high overall visual sensitivity of the setting viewed from the KOP 2 area, the resulting visual impact would be adverse but less than significant.

KOP 3: Shoreline Trail at Sulphur Creek

Visual Resources Figure 8 is a simulation of the radio towers, as they would be seen from KOP 3. While the vertical form of the towers would cause high contrast with the horizontal form of the landforms, their vertical form and straight line would appear similar to the form and line of the existing, five KTCT radio towers. Because there are existing vertical elements in the view from KOP 3, the additional visual contrast due to the project would be moderate. The proposed towers would appear taller than the East

Bay Hills but shorter than the existing KTCT towers, so scale contrast would be moderate. At this distance, the white color bands on the towers would cause low to moderate contrast with the sky. Although the towers would be somewhat prominent because they would be tall and skylined, at this distance their dominance would be reduced because they would occupy a very small part of the overall field of view. Thus, overall project dominance would be low to moderate. The towers would block a very minor portion of the sky, so the severity of view blockage would be low.

The proposed RCEC would also be visible from KOP 3. At this distance, the arched form and curved lines of the RCEC relate fairly well with the form and line of the East Bay Hills. Although it would be skylined, the RCEC would be a small object and would occupy a very small part of the setting, so project dominance would be low to moderate. The RCEC would block a very minor portion of the sky, so the severity of view blockage would be low.

The relocated radio towers and RCEC would cause low to moderate overall visual change as viewed from the area of KOP 3. Combined with the moderate to high overall visual sensitivity of the setting viewed from KOP 3, the resulting visual impact would be adverse but less than significant.

LIGHT OR GLARE

According to the City of Hayward Use Permit Conditions of Approval (City of Hayward, 2001b), aircraft warning lights on the radio towers would be white strobe lights, unless otherwise directed by the FAA, and would be as few in number as allowed by FAA rules. These lights would be on during the day and, at a reduced intensity at night. According to the FAA Determination of No Hazard to Air Navigation issued January 17, 2002, warning lights on the relocated towers would be red. These lights are only required to be on at night because the towers would be painted orange and white to alert aircraft to their location during the day. The red warning lights on the existing KFAX radio towers are visible from State Route (SR) 92, so relocating the towers to the proposed location would not create a new source of substantial light that could adversely affect nighttime views from SR 92. Because the Hayward Regional Shoreline Park is closed after sunset, locating towers equipped with red flashing warning lights near the park entrance would not have a significant adverse visual impact. The white strobes would be noticeable to park users during the day. However, based on a field observation of the existing KTCT towers, which are equipped with white strobes, staff would not consider the light emitted by the towers to be so substantial as to cause a significant adverse impact on daytime views. Using white strobes would allow the towers to be painted gray rather than orange and white, substantially reducing their color contrast with the sky and hills.

Exterior lighting on the ancillary structures if needed for operational safety and security would be shielded from public view, and non-glare fixtures and the use of switches, sensors, and timers would be used to minimize the time that lights not needed for safety and security are on. Prior to issuance of a building permit, a lighting plan would be reviewed and approved by the City of Hayward. In addition to the measures specified, Energy Commission staff would recommend that exterior light fixtures are hooded and lighting is directed downward or toward the area to be illuminated to minimize

backscatter to the night sky and uplighting of the towers. With proper implementation of the lighting controls specified by the City, and the additional measures recommended by Energy Commission staff, lighting for operational safety and security would not create a new source of substantial light that could adversely affect nighttime views.

The City of Hayward use permit conditions require the relocated radio towers to be finished in a non-reflective, anodized metal color. This mitigation measure would substantially reduce the color contrast of the towers, and as viewed from a distance, enable the towers to recede into the backdrop of the East Bay Hills and sky. However, according to the FAA Determination of No Hazard to Air Navigation, the relocated towers would be painted in alternating orange and white bands. FAA Advisory Circular (AC) 70/7460-1K, Obstruction Marking and Lighting, specifies the paint standards for the orange and white paint. Based on a telephone conversation with an individual in the industrial paint industry, Energy Commission staff understands that the paints identified in the FAA circular are high gloss paints. However, during a field reconnaissance, the only glare staff observed reflecting from the existing KFAX radio towers was from portions of the guy wires. Since the new towers would be guyless, self supporting towers, staff would not expect the relocated towers to be a source of substantial glare that could adversely affect daytime views.

The transmitter equipment enclosures at the base of the towers would be constructed of concrete masonry units using a decorative finish such as slumpstone, would use non-glare roof materials, and would be finished with earth tone paint. The small electronics cabinets would be constructed of metal and also would be finished in earth tone paint. Fencing surrounding the towers would be decorative metal fencing (such as wrought iron or tubular metal). The final design and color of the ancillary structures and design and height of the fencing would be reviewed and approved by the City prior to issuance of a building permit. Energy Commission staff recommends that fencing material and the paint used on the transmitter equipment enclosures should be non-reflective to reduce daytime glare impacts. With proper implementation of the measures specified by the City, and the additional measures recommended by Energy Commission staff, the ancillary equipment and fencing would not create a new source of substantial glare that would adversely affect daytime views.

CUMULATIVE IMPACTS

No reasonably foreseeable planned projects that would contribute to cumulative visual impacts were identified.

CONCLUSIONS

Due to the project's high level of visual contrast (form, color, and scale) and moderate to high dominance from near foreground viewpoints from within the Hayward Regional Shoreline (park entrance, parking/staging area, and trailheads), the relocated radio towers would cause significant adverse visual impacts. Changing the color of the towers from orange and white to a non-reflective, metal color as required by the City's permit conditions would reduce the color contrast. The tower proponent has submitted an amended application to the FAA to request this change in the marking and lighting of the towers. Strategically planting additional trees, such as along the base of the landfill,

to reduce the visibility of the towers from the area of KOP 1 also would be beneficial. However, similar to landscaping on the RCEC site, staff assumes that any trees proposed in this area would need to be approved by the U.S. Fish and Wildlife Service as unattractive to perching by raptors. The approved tree species would not screen the towers sufficiently to reduce within a reasonable timeframe (5 years), the visual impacts to a less than significant level. Staff understands that the landfill must be protected from root intrusion by any trees proposed along the berm of the landfill (Ameri 2002). If it is feasible to plant trees along the base of the landfill without compromising the integrity of the landfill, staff recommends condition of certification **VIS-12** requiring Calpine/Bechtel (or current project owner) to install trees to screen views of the towers from the area of KOP 1 to the greatest extent possible. (Other conditions of certification (VIS-1 to VIS-11) are listed in the Visual Resources section of the Final Staff Assessment.)

VIS-12 Prior to the first turbine roll, the project owner shall prepare and implement a landscape plan to partially screen views of the KFAX radio towers from the West Winton Avenue entrance to the Hayward Regional Shoreline Park and parking/trailhead area to the greatest extent possible. Fast growing, evergreen species shall be used, and of sufficient height and density, to achieve maximum effective screening of the radio towers as soon as possible. Suitable irrigation shall be installed to ensure survival of the plantings.

Protocol: The project owner shall submit the landscape plan to the City of Hayward and the U.S. Fish and Wildlife Service for review and comment, and to the Compliance Project Manager (CPM) for review and approval. The plan shall include:

a) A detailed landscape and irrigation plan, at a reasonable scale, which includes a list of proposed tree species, installation sizes, and growth rates, and a discussion of the suitability of the plants for the site conditions. A list of potential tree species that would be viable in this location shall be prepared by a qualified professional arborist familiar with local growing conditions (in consultation with the U.S. Fish and Wildlife Service), with the objective of providing the widest possible range of species from which to choose.

b) 11" x 17" color simulations of the proposed landscaping at 5 years as viewed from the entrance to the Hayward Regional Shoreline and the parking area;

c) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and

d) A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM.

Verification Prior to the first turbine roll and at least sixty (60) days prior to installing the landscaping, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within thirty (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 (7) days after completing installation of the landscaping that the plantings and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, in the Annual Compliance Report.

SUMMARY

Energy Commission staff have evaluated the environmental effects of relocating four radio transmission towers from the proposed RCEC site to a new location atop the Old West Winton landfill. The towers have been granted a Conditional Use Permit by the City of Hayward. Staff believe that relocation of the towers should not have a significant impact on biological resources, but recommend that preconstruction surveys be conducted for nesting burrowing owls in light of RWQCB's recommendations that disking of the site be discontinued. Staff also recommend that facility lighting be directed down and away from open-space areas. The radio towers are not expected to pose a public health, safety or nuisance risk. Similarly, no adverse impacts to geological, paleontological, or water resources are expected.

While the new site is not considered ideal based on the general intent of the Hayward Area Shoreline Planning Program, no specific land use conflicts were identified. No traffic or aviation safety impacts are expected. However, due to the project's high visual contrast and moderate to high dominance from near foreground viewpoints from within the Hayward Regional Shoreline, the relocated towers could cause significant and unmitigable visual impacts.

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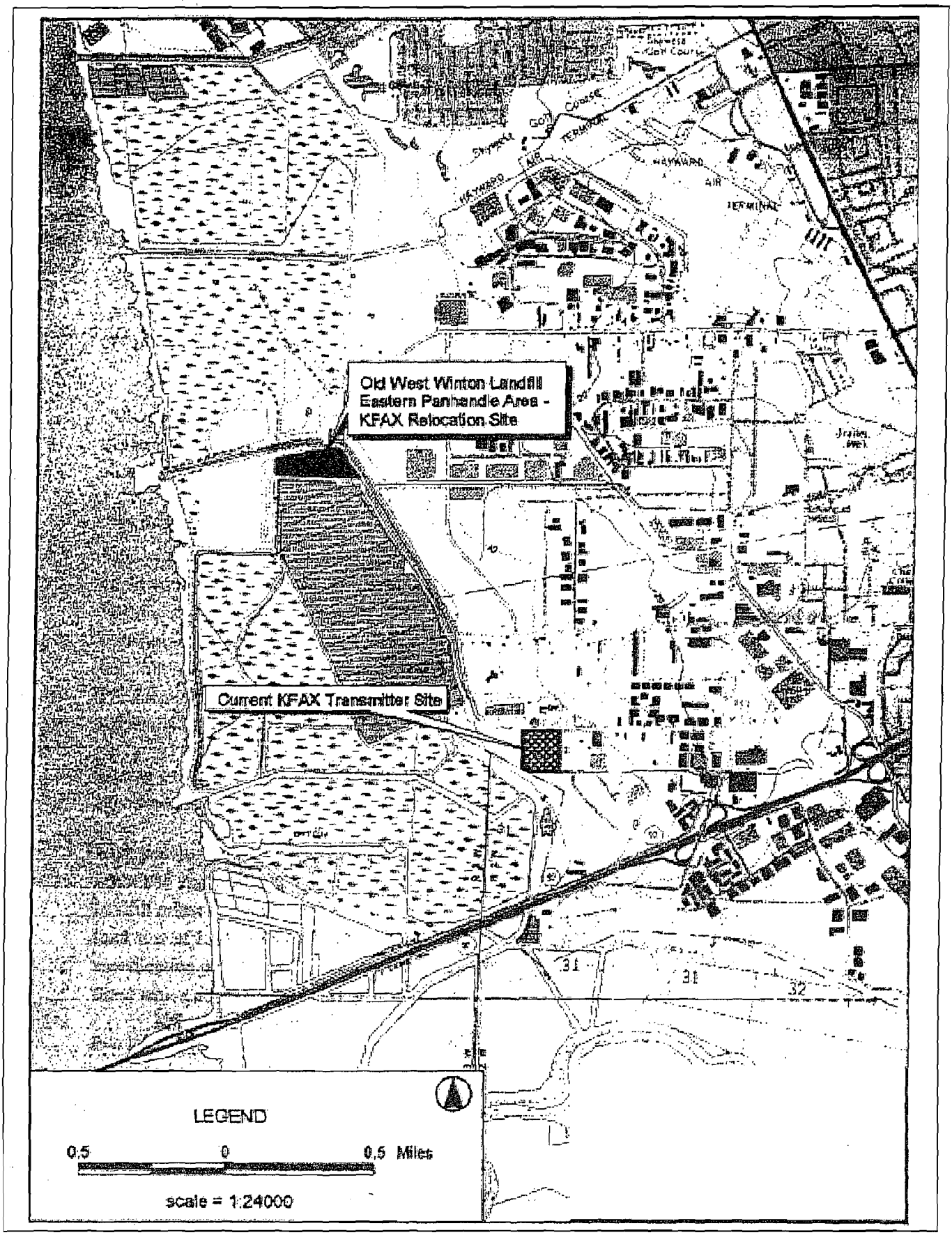
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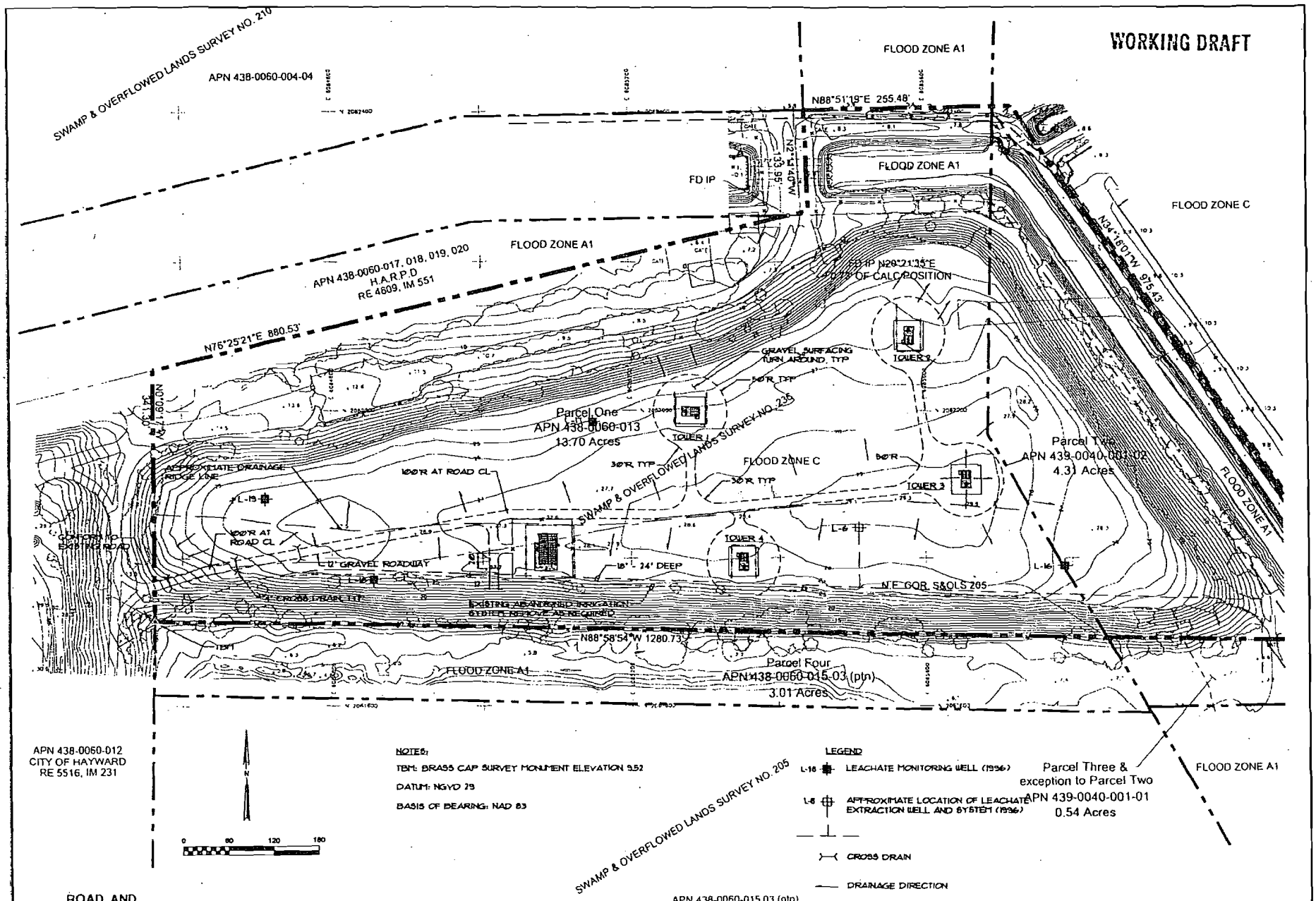
PROJECT DESCRIPTION - Figure 1
Russell City Power Project - Project Site Location Map



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JANUARY 2002
SOURCE: Calpine/Bechtel

PROJECT DESCRIPTION - FIGURE 2

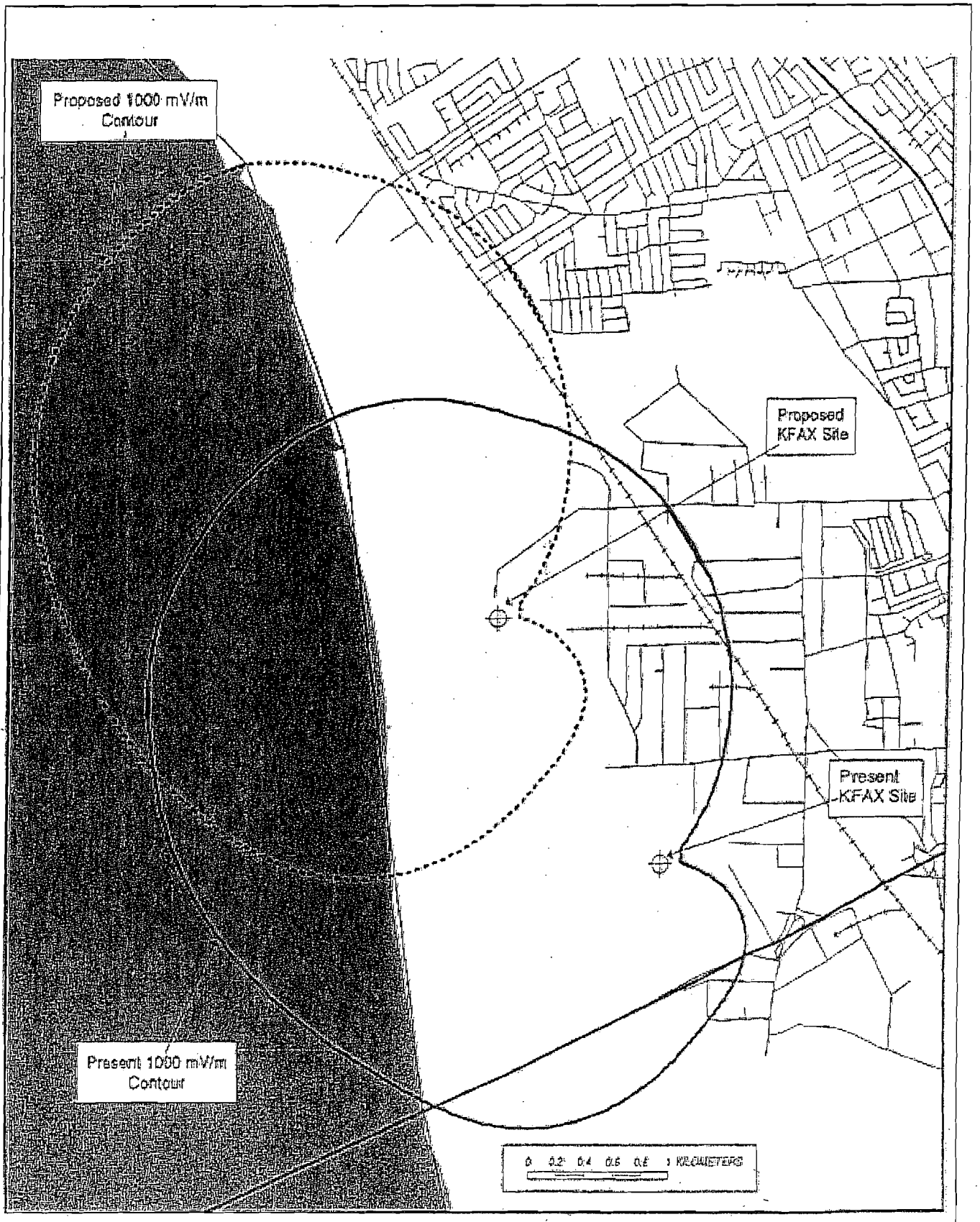
Russell City Energy Center - Location of Radio Towers on Project Site



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JANUARY 2002

SOURCE: Calpine/Bechtel

PUBLIC HEALTH, SAFETY and NUISANCE - Figure 1
Russell City Power Project - One Volt Per Meter Contour



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JANUARY 2002
SOURCE: Carl T. Jones Corporation

PLACEHOLDER FOR REPORT FIGURES

Project Description

Figure 1 – Project Site Location Map
Figure 2 – Location of Radio Towers on Project Site

Public Health, Safety and Nuisance

Figure 1 – One Volt Per Meter Contour

Visual Resources

Figure 1 – Project Setting and Key Observation Points
Figure 2 – West Winton Avenue (KOP 1)
Figure 3 – West Winton Entrance to Hayward Regional Shoreline (Parking and Trailhead Area)
Figure 4 – Shoreline Trail at Cogswell Marsh Footbridge (KOP 2)
Figure 5 – Shoreline Trail at Sulphur Creek (KOP 3)
Figure 6 – West Winton Avenue (KOP 1) – Visual Simulation
Figure 7 – Shoreline Trail at Cogswell Marsh Footbridge (KOP 2) – Visual Simulation
Figure 8 – Shoreline Trail at Sulphur Creek (KOP 3) – Visual Simulation

RUSSRLL CITY ENERGY CENTER PROJECT
PREPARATION TEAM

Executive Summary	Jack W. Caswell
Introduction	Jack W. Caswell
Project Description	Jack W. Caswell
Air Quality	Gabriel Beymer
Biological Resources	Start Itoga and Rick York
Cultural Resources	Roger D. Mason
Hazardous Materials	Alvin Greenburg Ph.D.
Land Use	Jon Davidson, AICP and David Flores
Noise and Vibration	Brewster Birdsall
Public Health	Obed Odoemelam, Ph.D.
Socioeconomics	Daniel Gorfain
Soil and Water	Joe Crea, John Scrrogs, Jim Henniforth and John Kessler
Traffic and Transportation	Fred Choa, P.E.
Transmission Line Safety and Nuisance	Obed Odoemelam, Ph.D.
Visual Resources	Eric Knight
Waste Management	Alvin Greenberg, Ph.D.
Worker Safety and Fire Protection	Alvin Greenberg Ph.D.
Facility Design	Shahab Khoshmashrab, Steve Baker and Al McCuen
Geology and Paleontology	Neal Mace
Power Plant Efficiency	Shahab Khoshmashrab
Power Plant Reliability	Shahab Khoshmashrab
Transmission System Engineering	Ajoy Cuha P.E. and Al McCuen
Alternatives	Dr. Suzanne Phinney

General Conditions.....Jeri Zene Scottt

Project Assistant..... Raquel Rodriguez / Luz Manriquez

Support Staff..... .....Suzanne Franks / Adrian Gilbreath

RESUMES

AND

DECLARATIONS

DECLARATION OF
Richard York

I, **Richard York** declare as follows:

1. I am presently employed by the California Energy Commission in **the Environmental Protection Office** of the **Systems Assessments and Facilities Siting Division** as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Aquatic Biological Resources and Terrestrial Biological Resources Sections** for the **POTRERO POWER PLANT UNIT 7 PROJECT** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Richard York Signed: June 7, 2002

At: Sacramento, California

RICHARD YORK

WORK EXPERIENCE SUMMARY

Experienced in biological resource assessment including endangered species surveys, field survey protocols, endangered species mitigation and monitoring, coordination with state and federal agencies, and wetland delineation. Educational background emphasized biological resources, plant identification and taxonomy, general ecology, and herbarium specimen curatorship.

WORK EXPERIENCE

1989 – to date **PLANNER II, California Energy Commission.** I provide independent biological resource assessments of proposed energy facilities and review implementation of biological resource conditions of certification required by the Warren-Alquist Act and the California Environmental Quality Act. Once energy facilities are constructed and operating, I am responsible for making sure each facility operates in compliance with associated biological resources conditions of certification. These conditions of certification involve endangered species protection, habitat restoration and monitoring, off-site habitat compensation, and wildlife surveys.

I am also involved with various preserves in the San Joaquin Valley (Semitropic Ridge and Lokern) that were established with Energy Commission mitigation funds. Also, I edited the endangered species and sensitive biological resource policy paper for the California Energy Commission's Energy Facilities Siting and Environmental Protection Division.

1986 - 1989 BOTANIST, The Nature Conservancy. Collected, mapped and computerized rare plant location and ecological information for the California Natural Diversity Data Base while under contract to the California Department of Fish and Game. Required statewide coordination with many other botanists, some field work, and management of contracts.

1980 - 1986 **BOTANIST, California Native Plant Society.** Compiled and co-edited the 3rd edition of the California Native Plant Society's statewide *Inventory of Rare and Endangered Vascular Plants of California.* Work involved field surveys, attendance at public meetings and statewide board meetings, coordination and supervision of volunteers, data base management and quality control, endangered species regulatory review and comment, coordination with state and federal agencies, and writing special plant status reports.

1975 - 1980 **BOTANIST/RANGE TECHNICIAN** (Bureau Land Mgmt., Wyoming)
HERBARIUM ASSISTANT (Humboldt State University)
RESEARCH ASSISTANT (California Native Plant Society)
PARK AIDE (California Department of Parks and Recreation)
PRIVATE BOTANICAL CONSULTANT (Six Rivers National Forest)

EDUCATION

- B. S. **BOTANY**, 1979, Humboldt State University, Arcata, California
- B. A. **PSYCHOLOGY**, 1979, Humboldt State University, Arcata, California

AWARDS

- 1992 RARE PLANT CONSERVATION AWARD – California Native Plant Society

PROFESSIONAL AFFILIATIONS

- California Native Plant Society
- California Botanical Society
- The Nature Conservancy
- Interagency Botanists

DECLARATION OF
Gabriel D. Behymer

I, **Gabriel Dylan Behymer** declare as follows:

1. I am presently employed by the California Energy Commission in the **Environmental Office** of the **Systems Assessments and Facilities Siting Division** as a **Mechanical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Air Quality**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/24/02 Signed: _____

At: Sacramento, California

Gabriel D. Behymer

1516 9th Street, MS 40, Sacramento, CA 95814
gbehymer@energy.state.ca.us
(916) 654-4482

OBJECTIVE

A position involving detailed problem solving, technical analysis and hands-on engineering with opportunities for professional growth.

EMPLOYMENT HISTORY

California Energy Commission, MECHANICAL ENGINEER, Sacramento, CA (Dec. 1999 – Present)
Power Plant Siting Division, Air Quality section. Reviewed and analyzed permit amendments and Applications For Certification (AFC) for power plants of greater then 50 MW output. Testified as an expert witness in support of my analysis. Conducted Continuous Emission Monitor research study for the Public Interest Energy Research (PIER) program.

General Electric Nuclear Energy, ENGINEERING CO-OP, San Jose, CA (Jan. – Aug. 1998)
Chemistry Technologies Group, Hydrogen Water Chemistry (HWC) division. Participated in the production process for HWC systems from the receipt of the purchase order through delivery. My duties included mechanical design & verification, AutoCAD drafting, complete document issuing, and factory acceptance testing.

Laney College, TEACHING ASSISTANT, Oakland, CA (Jan. – Dec. 1996)
Engineering 45 (Properties of Materials): Repaired laboratory equipment (including six metallurgical microscopes), prepared laboratory exercises and conducted lab sessions, graded thirty to thirty-five homework assignments per week, tutored students individually and in groups.

University of California, Berkeley, TECHNICAL TUTOR, Berkeley, CA (Aug. – Dec. 1996)
Privately tutored college students in Calculus, Linear Algebra & Differential Equations, Physics, Chemistry, Properties of Materials, and Engineering Statics.

Peet's Coffee & Tea, SALES ASSOCIATE, Emeryville, CA (April 1994 – July 1996)

COMPUTER SKILLS

- Windows 3.1/95/98
- MS-DOS
- UNIX
- Mac OS
- AutoCAD 13/14
- Claris CAD
- MathCAD 6.0
- Visio
- MS Excel
- MS Power Point
- MS Word 97
- HP-VEE
- DOS Batch Programming
- FORTRAN 77/90
- Hardware Assembly
- Software Installation

EDUCATION

University of California, Berkeley
Bachelor of Science
Double Major: Mechanical Engineering and Materials Science & Engineering
3.12 UCB GPA (1993 – Graduation)

Peralta Community College (Fall 1993 – Fall 1996)
4.0 Overall GPA

TECHNICAL COURSE WORK

- Bonding, Crystallography & Crystal Defects
- Corrosion & Electrochemistry
- Electronic Techniques for Engineers
- Energy, Politics and Society
- Engineering Mechanics
- Experimental Materials Science Laboratory
- Experimentation & Measurement Laboratory
- Fluid Dynamics & Applied Fluid Dynamics
- Heat & Mass Transfer
- Mechanical Behavior & Processing of Materials
- Mechanical Engineering Design Laboratory
- Phase Transformation & Kinetics
- Properties of Materials
- Technical Communication & Writing
- Thermal Environmental Control Systems
- Thermodynamics

RECOGNITION & ACTIVITIES

- Published: "The Challenges Facing Hydroelectric Power" in The California Engineer (Fall 1997)
- Hazardous Waste Operations and Emergency Response Certified (HAZWOPER, Title 8 CCR 5192)
- President, Materials Science & Engineering Association (MSEA) (Fall 1997)
- MSEA Representative to the Engineer's Joint Council (Spring 1997)
- Industry Liaison, Engineer's Joint Council (Fall 1997)
- Member of the UC Berkeley Materials Science & Engineering Association
- Member of the American Society of Mechanical Engineers (ASME)
- Member of the American Society of Heating, Refrigerating & Air-Conditioning Engineers (ASHRAE)

DECLARATION OF

I **Suzanne Phinney,** declare as follows:

1. I am presently employed by the California Energy Commission, via Aspen Environmental Group, in the Hazardous Materials Management, Waste Management, Worker's Safety and Fire Protection Unit of the Energy Facilities Siting and Environmental Protection Division as a Consultant.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Alternatives for the **Russell City Energy City Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related to Alternatives Assessment in the testimony, and if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/15/02 Signed: Suzanne Phinney

At: Aspen Environmental Group, Sacramento, CA

SUZANNE L. PHINNEY, D. ENV.
Vice President, Sacramento Operations

ACADEMIC BACKGROUND

Doctorate, Environmental Science & Engineering (D.Env.),
University of California, Los Angeles, 1981
M.S., Marine Biology, Dalhousie University, Halifax,
Nova Scotia, Canada, 1975
B. A. Biological Sciences
University of California, Berkeley, 1973

PROFESSIONAL EXPERIENCE

Dr. Phinney has over 20 years of experience in the environmental field, supporting both the public and private sectors in environmental remediation, air and water quality assessments, risk assessment, regulatory compliance, permitting and project/program management.

Aspen Environmental Group — 2001 to present

As Vice President, Sacramento Operations, Dr. Phinney is responsible for all aspects of work conducted from Aspen's Sacramento office. Her responsibilities include project management, client support and biological, air and water resource analyses. Dr. Phinney was project manager for Aspen's technical contributions, graphics and production efforts related to the California Energy Commission's Environmental Performance Report which details the current and historical air, water and biological impacts from in-state generation facilities. She is currently scoping a major effort for the Energy Commission to review and update information on alternative electric generation technologies. Dr. Phinney is also serving as author and Aspen Power Plant Coordinator for several power plant applications currently under review at the Energy Commission.

GenCorp — 1999 to 2000

As Vice President, Environmental and Regulatory Affairs, Dr. Phinney held primary responsibility for coordinating the company's aerospace and automotive environmental activities with various federal, state, and local regulatory agencies. Her specific responsibilities included: working with external groups and entities to develop responsible environmental legislation, regulations, and standards and the implementation of sound public policy; developing stakeholder base and strategy to ensure that company objectives were achieved; facilitating company and regulatory agency discussions to achieve more comprehensive and quicker remediation of sites; and spearheading a stakeholder group to develop and fund scientific studies on selected chemicals of concern. Specific projects include:

- **Perchlorate Standard Setting:** Developed strategy to convince state agency to refrain from a standard setting process that would have resulted in a premature, highly restrictive standard. Strategy involved the identification and completion of focused health studies in an unprecedented rapid timeframe, development of multi-stakeholder partnership group and open-ended frequent communication with all parties.

- **NOx Reduction Stakeholder Group:** Coordinated business, health, environmental, regulatory agency and elected official representatives in an accelerated process to identify and implement actions that would reduce emissions of nitrogen oxides (NOx) in the Sacramento region. In the space of nine months, group has created legislation that will bring $70,000,000 of incentive funds to the region, has significantly advanced introduction of new technologies, developed educational materials and secured regulatory agency commitments to streamline approval process and timelines.

Aerojet General Corporation — 1984 to 1999

As Vice President, Environmental, Health and Safety, Dr. Phinney ensured that programs were in place to meet all regulatory requirements and company initiatives. Her responsibilities included: providing strategic direction

and management of all superfund-related investigation and remediation activities; communicating environmental requirements, concerns, and successes to both internal and external audiences, including the board of directors, investment banking, and the analyst community; and participating as a member of the leadership council in defining company-wide business objectives and targets.

Dr. Phinney created the first corporate ESH department, defining and staffing key functional areas. She managed a $20,000,000 annual budget and oversaw a staff of up to 30 professionals. Select accomplishments include: the development of remediation technologies that resulted in the cleanup of over 50 billion gallons of contaminated groundwater; development of the world's first groundwater treatment facility for perchlorate; representation on numerous legislative and regulatory task forces and leadership positions on external business and community EHS committees and councils; and extensive public outreach efforts. Representative projects include:

- **Carveout of Noncontaminated Land:** Participated in negotiations and meetings with state agency to carve out 1,500 acres from "Superfund" designation. Oversaw the completion of investigation activities and the submission of a report which resulted in removal of the acreage from any future regulatory requirements.

- **Development of Cost-Efficient NDMA Treatment Technology:** Completed screen and bench testing of alternative NDMA treatment technologies which ultimately saved 95% of the electrical power consumed by other methods of NDMA removal previously used onsite.

- **Construction of Perchlorate Treatment Facility:** Designed and constructed the world's first perchlorate treatment plant, a 4,000 gpm capacity with expansion capabilities to 8000 gpm. Received the Aerojet Technology Development Award and GenCorp Technology Award for this project.

- **Reduction of Soil Remediation Costs:** Conducted statistical calculations and toxicology review of metal-impacted soils and presented findings to the California EPA to prove that the soils did not pose a health threat. As a result, received agency agreement not to require remediation of 2,000 cubic yards of beryllium impacted soils, saving over $250,000 in planned soil remediation costs.

- **Recovery of Insurance Costs:** Provided extensive support to legal counsel in insurance recovery actions. Provided back-up documentation for all environmental invoices dating back to 1991 and documented all environmental operations activities since that date. Actions supported reimbursement of tens of millions of dollars by insurers in past costs.

- **Safety and Environmental Awards:** Under Dr. Phinney's management, Aerojet received the Sacramento Safety Center's highest safety award in 1998 for its outstanding safety record. The company was also a 1998 winner in the state of California's waste reduction awards program (WRAP).

- **Environmental Compliance:** Ensured that the company received no notices of major environmental violations and/or fines. Significantly reduced total environmental incidents and reportable incidents through the implementation of health and safety training programs throughout the plants.

- **Avoidance of Disposal Costs:** Received RCRA treatment/storage permits for seven RCRA units in Sacramento, which allowed the company to treat materials on site versus off site disposal, resulting in cost savings of approximately $2,000,000 per year. Similarly surplus sales of waste material in Sacramento netted $38,000 with disposal cost avoidance of $1,130,000.

- **Closure of Facility/Regulatory Compliance:** Received timely approval of the closure of the Chino Hills facility, significantly reducing the explosive inventory and closing out the radioactive materials license. Also, completed asbestos and lead paint building survey with results indicating only a limited exposure from these issues.

- **Waste Reduction:** Managed highly effective waste reduction programs. Eliminated use of all CFC materials well in advance of regulatory requirements. Increased waste reduction and cost avoidance of hazardous waste disposal by negotiating sales of 75% of surplus chemicals

- **Community Relations/Partnerships:** Worked closely with community groups on issues of concern to the community and the company. As chair of the Cleaner Air Partnership, a joint project of the American Lung

DECLARATION OF
Shahab Khoshmashrab

I, **Shahab Khoshmashrab** declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Systems Assessment and Facility Siting Division as a **Mechanical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the Staff Testimonies on **Reliability and Efficiency**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared Testimonies are valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the Testimonies and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 10, 2002 signed: _____

At: Sacramento, California

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Seven years experience in the Mechanical, Civil, Structural, and Manufacturing Engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering

Professional Experience

2001--Mechanical Engineer, Systems Assessment and Facilities Siting– California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

1998-2001--Structural Engineer – Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced structural engineering detail drawings.

1995-1998--Manufacturing Engineer – Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed fabrication and inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF

Jack W. Caswell

I, Jack W. Caswell declare as follows:

1. I am presently employed by the California Energy Commission in the Siting Office of the Energy Facilities Siting and Environmental Protection Division as a Project Manager.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on the Executive Summary section for the Russell City Energy Center Project (01-AFC-07), based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/31/02 Signed: Jack W. Caswell

At: Sacramento, California

JACK W. CASWELL
Project Manager
California Energy Commission

Experience Summary

Thirty Two years experience in project and staff management; military, industrial, electrical construction, commercial, and residential; QA/QC in the steel manufacturing industry, union grievance person for the United Steel Workers of America, including Business Officer/Business Management Analyst for the State Water Resources Control Board.

Professional Experience

2000/Presant: Project Manager; for the Tesla Power Project, (02-AFC-21), Valero Cogeneration Project, (01-AFC-05), Huntington Beach Generating Station Retool Project, (00-AFC-13), Hanford Energy Park Project (00-SPPE-1), Warnerville Substation Reliability Generation Project (00-AFC-11), Western Midway Sunset Cogeneration Company Project (99-AFC-9), and: develop project schedules, function as team leader for technical staff. Provide project status reports to CEC commissioners and CEC director. Primary contact for the applicant, public and interveneors, throughout AFC process.

1993/2000: Facilities Lead, (ABMA); at the State Water Resources Control Board (SWRCB), Associate Business Management Analysts/Project Lead and senior technical person for real-estate and construction, including construction budget analysis; project cost benefit analysis, scope of work development. Responsibility for the facilities analysis of Regional Water Quality Control Boards (RWQCB). Provide recommendations to SWRCB Director and RWQCB Executive Officers.

1990/1993 Lead Electrician; State Department of General Services, Installation of electrical transmission lines and equipment; provide cost estimates, develop drawings, operation of power generating plants, Manage complex electrical projects for state buildings, and develop maintenance procedures and programs.

1980/1990 Electrical Construction Supervisor; project supervisor for large commercial construction projects, industrial plants, water and sewer treatment plants, including residential projects. Responsible for the supervision of project staff, development of schedules, advised on technical engineering changes, and construction material ordering.

1973/1980 Quality Control Inspector & USWA Grievance Representative; conducted quality control inspections and implemented quality assurance procedures in the steel manufacturing industry. Elected to grievance representative in 1974, responsible for representing Sacramento local USWA membership in grievance proceedings with a local steel product manufacturing company.

Education

- Sierra College
- Electrical Construction Technical School
- State Training Center, Business Analyses Course Studies

DECLARATION OF

Al McCuen, Shahab Khoshmashrab and Steve Baker

We the undersigned, declare as follows:

1. We are presently employed by The California Energy Commission in the **Engineering Office** of the Systems Assessment and Facility Siting Division as

   Senior Electrical Engineer-Mr. McCuen, Mechanical Engineer-Mr. Khoshmashrab and **Senior Mechanical Engineer-Mr. Baker.**

2. Copies of our professional qualifications and experience are attached hereto and incorporated by reference herein.

3. We prepared our respective portions of the Staff Testimony on **Facility Design**, for the **Russell City Energy Project** based on our independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and our professional experience and knowledge.

4. It is our professional opinion that the prepared Testimony is valid and accurate with respect to the issues addressed therein.

5. We are personally familiar with the facts and conclusions related in the Testimony and if called as witness(es) could testify competently thereto.

We declare under penalty of perjury that the foregoing is true and correct to the best of our knowledge and belief.

Al McCuen _____

Shahab Khoshmashrab _____

Steve Baker _____

Dated: May 10, 2002

At: Sacramento, California

STEVE BAKER, P.E.
Senior Mechanical Engineer

Experience Summary

Twenty-seven years experience in the electric power generation field, including mechanical design, QA/QC, construction/startup and business development/licensing of nuclear, coal-fired, hydroelectric, geothermal and windpower plants; and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Long Beach--Master of Business Administration
- California State Polytechnic University, Pomona--Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

1990 to Present--Senior Mechanical Engineer, Siting & Environmental Division - California Energy Commission

Technical lead person for the analysis of generating capacity, reliability, efficiency, noise, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases. Key contributor to Commission's investigation into market impediments to the deployment of advanced high-efficiency generating technologies.

1987 to 1990--Generation Systems/Facility Design Unit Supervisor, Siting & Environmental Division - California Energy Commission

Responsible for supervising the analysis of generating capacity, reliability, efficiency, safety, and mechanical, civil/structural, and geotechnical engineering aspects of power plant siting cases.

1981-1986--Operations Manager, Alternate Energy - Santa Fe Pacific Realty Corporation

Participated in and supervised identification, evaluation and feasibility analysis, licensing and permitting of hydroelectric, geothermal, windpower and biomass power projects.

1974-1981--Mechanical Engineer, Quality Engineer - Bechtel Power Corporation and Bechtel National, Inc.

Wrote equipment specifications, drew flow diagrams and P&ID's, performed system design and safety analysis for nuclear power plants and nuclear fuel processing plant. Wrote and implemented QA/QC procedures for nuclear power plant. Participated in construction/startup of large coal-fired power plant.

DECLARATION OF

Jeri Zene Scott

I, Jeri Zene Scott declare as follows:

1. I am presently employed by the California Energy Commission in the Siting Office of the Systems Assessment and Facilities Siting Division as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on the general conditions for compliance monitoring and facility closure for the Russell City Energy Center Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 14, 2002 Signed: Jeri Zene Scott

At: Sacramento, California

JERI ZENE SCOTT
PLANNER II

CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, CA 95814
(916) 654-4228

EXPERIENCE:

May 1994 to present — California Energy Commission -- Energy Facilities Siting and Environmental Protection Division

Compliance Project Manager -- Over-see the construction and operation activities of energy facilities. With assistance from the division's technical staff, ensure that project owners comply with the conditions of certification. Serve as team leader in the processing of post-certification amendments, complaints and facility closures. Work with the Siting Project Manager to review conditions of certifications. Serve as team leader for all compliance monitoring activities.

June 1991 to May 1994 — California Energy Commission -- Energy Facilities Siting & Environmental Protection Division

Energy Analyst -- Plan and organize compliance monitoring activities; coordinate and participate in site visits, audits and compliance workshops; review conditions of certification; work with the project owner, division management and technical staff to resolve compliance issues and process post-certification changes to the project.

June 1989 to June 1991 — California Energy Commission -- Energy Facilities Siting & Environmental Protection Division

Management Services Technician Assisted project managers in the noticing and scheduling of workshops, meeting and site visits. Provided information to power plant developers, agencies and the public regarding power siting and compliance activities and processes. Assisted in the review and editing of reports and analyses submitted by technical staff. Assisted in the gathering and analysis of compliance monitoring information related to compliance

submittal from project owners. Prepared compliance submittal for staff review and assisted in the maintenance of the compliance monitoring computer programs.

EDUCATION: Currently working on Bachelor of Science degree in Environmental Studies.

1979 Received AA degree from West Los Angeles Junior College.

DECLARATION OF
Neal Mace

I, **Neal Mace** declare as follows:

1. I am presently employed by Geotechnical Consultants, Inc. as an Engineering Geologist, working as a subconsultant to Aspen Environmental Group, a contractor to the California Energy Commission's Energy Facilities Siting and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Geology and Paleontology**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/10/02 Signed: _____

At: Sacramento, California

STATEMENT OF QUALIFICATIONS

NEAL W. MACE, C.E.G., R.G.
Chief Engineering Geologist

Mr. Mace is experienced in the application of the principals of engineering geology and hydrogeology to investigations for a broad variety of projects, including transportation facilities; wastewater treatment facilities; tunnels, oil and gas pipelines and processing facilities; port and offshore facilities, hydrogeologic analyses, and environmental assessments. His work has included geologic mapping, air photo interpretation, subsurface exploration of complex geologic structures and faults using drilling and trenching techniques, geologic and geotechnical analyses, report preparation, and project management.

REGISTRATION

Registered Geologist, State of California
Certified Engineering Geologist, State of California

EDUCATION

Pomona College, B.A., Geology, 1969
San Diego State University, M.S., Geology, 1981

EXPERIENCE

GEOTECHNICAL CONSULTANTS, INC. Since joining the firm in July of 1981, Mr. Mace has participated in a variety of projects, performing both field exploration and technical analyses. Mr. Mace supervised the geohazards investigation for the Celeron/All American Crude Oil Pipeline in western Santa Barbara County and southern San Luis Obispo County and the Cajon Crude Oil Pipeline in San Bernardino and Los Angeles Counties, California. In addition, Mr. Mace prepared the geology, seismicity, and soils sections for the Pacific Pipeline Project, Final EIR, the Pacific Pipeline Project EIS/SEIR, and the Yellowstone Pipeline EIS. His responsibilities during the pipeline geohazards investigations included supervision of field investigation consisting of reconnaissance level geologic mapping of the pipeline routes and detailed mapping, air photo analysis, and subsurface exploration of geohazards including faults and landslides. Mr. Mace has also prepared geologic, soils, and seismicity sections for the environmental documents listed below.

EIR/EIS Reports

Fisherman's Wharf Redevelopment Program EIR, San Francisco, California
East Central Interceptor Sewer EIR, Los Angeles County, California
Owens Valley Groundwater EIR, Inyo County, California

DECLARATION OF
Alvin J. Greenberg, Ph.D.

I, Alvin J. Greenberg, Ph.D. declare as follows:

1. I am presently a subcontractor to Aspen Environmental who has a contract with the California Energy Commission to provide consultative services to the **Environmental Protection Division**.

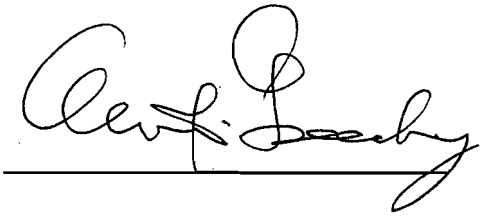
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Hazardous Materials Management, Waste Management,** and **Worker Safety and Fire Protection**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 10, 2002 Signed: 

At: Sacramento, California

Risk Science Associates

7 Mt. Lassen Dr., Suite A-129, San Rafael, Ca. 94903
415-479-7560 fax 415-479-7563
e-mail agreenberg@specialmasters.net

Name & Title: **Alvin J. Greenberg, Ph.D., FAIC, REA, QEP**
Principal Toxicologist

Dr. Greenberg has had two decades of complete technical and administrative responsibility as a team leader for hazardous waste site characterization, preparation of human and ecological risk assessments, air quality assessments, interaction with regulatory agencies in obtaining permits, hazardous materials handling and risk management prevention, conducting lead surveys and studies, with particular expertise in the assessment of dioxins, lead, and petroleum hydrocarbons. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is a former member of the State of California Occupational Health and Safety Standards Board and former Assistant Deputy Chief for Health, California OSHA.

Years Experience: 20

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California, San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association

DECLARATION OF
David Flores

I, **David Flores** declare as follows:

1. I am presently employed by the California Energy Commission in the **Environmental Protection Division** of the Systems Assessments and Facilities Siting as a **Planner 2**.

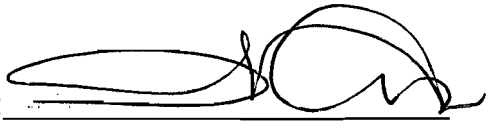
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Land Use**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 29, 2002 Signed: 

At: Sacramento, California

DAVID FLORES

WORK EXPERIENCE

Sept. 1998 to Present — **Planner 2.** California Energy Commission, Energy Facilities Siting and Protection Division.

- Provide technical analysis of proposed energy planning, conservation, and development programs on land use, visual and traffic and transportation resources. Specific tasks include the analysis of potential impacts, identification of suitable mitigation measures, preparation of testimony, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations.

March 29,1988 to September 12, 1998 — **Senior Planner.** County of Yolo Planning and Public Works Department

Senior Planner - Current and Advanced Planning (Resources Management and Planning)

Responsibilities included the following:

Administered the establishment of Planning schedules and timeframe completion schedules; Administration and staff support to Planning Commission and Board of Supervisors; Staff support and liaison to citizen's committees. Preparation of Environmental documents (Negative Declarations, preparation of Environmental Impact Reports and Categorical Exemptions) in accordance with State and Federal Regulations.

PLANNING ACHIEVEMENTS

~ Principal staff involved in development of the County Right to Farm and Williamson Act/ Blue Ribbon Ordinances.

~ Staff liaison to citizen committees for the communities of Yolo County

~ Substantial experience in working successfully with community organizations and committees on controversial projects.

~ Responsible for the administration of the California Environmental Quality Act (CEQA) for all matters going before the Planning Commission and Board of Supervisors.

EDUCATION

California State University @ Sacramento
University of California @Davis
Major: Environmental Studies
Minor: Business Administration

Continuing education has included: Writing for Managers, CEQA Updates,

DECLARATION OF
Jon Davidson

I, **Jon Davidson** declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting and Environmental Protection Division as a consultant.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Land Use for the Russell City Energy Center project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Jon Davidson Signed: 5/13/02

At: Agoura Hills, California

JON K. DAVIDSON, AICP
Vice President, Urban and Environmental Planning

ACADEMIC BACKGROUND
Master of Urban and Regional Planning, California State Polytechnic University, Pomona, 1985
B.A., Urban Planning, University of Washington, 1981

PROFESSIONAL EXPERIENCE

Mr. Jon Davidson, AICP, is an urban planning and environmental professional with more than 19 years of experience in providing consulting services to government agencies. Mr. Davidson has managed or had a major role in the preparation of more than 110 EIRs, EISs, and EAs, and has prepared over 30 plans and planning studies, including land use studies, general plans, specific plans, redevelopment plans, and site plans. He has a diverse background in land use planning, policy formulation, environmental review, technical writing, public presentation, and project management.

Land Use and Socioeconomic Impact Analysis

- Yellowstone Pipeline Reroute EIS
- Rio Salado Environmental Restoration EIS
- Whitewater River Basin (Thousand Palms) Flood Control Project EIS/EIR
- Six Flags Power Line and Substation Project
- Valley-Auld Power Line Project
- CPUC Hydrodivestiture EIR
- San Antonio Creek Erosion Repair EAs
- Bolsa Chica Domestic Water Transmission Line and Wastewater Service Project EIR
- San Sevaine Redevelopment Project EIR
- City of Pasadena Land Use & Mobility Elements EIR
- City of Irvine Comprehensive General Plan Update (Phase 2) Master EIR
- Cajon Pipeline EIR/EIS and Technical Studies
- Santa Barbara Long-Term Water Supply Plan EIR
- California Speedway EIR
- Bixby Ranch Development EIR
- Pico-Union Block 6 EIR
- Grove Avenue Corridor Specific Plan EIR
- Colorado River Water Allocation EAs
- Uptown Whittier/Greenleaf Avenue Redevelopment Project EIR
- City of Irvine Conservation and Open Space Element Revision EIR

Other Planning Analysis

- Mojave River Corridor Land Use Study
- City of Westlake Village, Housing Element Update
- City of Brawley, Housing Element Update
- Tucson (Ajo) Detention Basin Ecosystem Restoration Report
- Santa Cruz River Watershed Management Plan
- Jungleland Specific Plan and EIR
- City of Santa Monica, Local Coastal Program

Professional Affiliations

- American Institute of Certified Planners
- American Planning Association

DECLARATION OF
James Brewster Birdsall

I, **J. BREWSTER BIRDSALL** declare as follows:

1. I am presently employed by **ASPEN ENVIRONMENTAL GROUP,** a contractor to the **California Energy Commission**, as a **SENIOR ASSOCIATE**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **NOISE AND VIBRATION**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/02 Signed: J Brewster Birdsall

At: San Francisco, California

BREWSTER BIRDSALL
Senior Associate

ACADEMIC BACKGROUND

M.S., Civil Engineering, Colorado State University, 1993
B.S., Mechanical Engineering, Lehigh University, 1991

PROFESSIONAL EXPERIENCE

Mr. Birdsall is an environmental engineer who specializes in noise assessments for industrial and land development related projects. His has more than seven years of consulting experience in conducting technical reports and environmental impact assessments under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). His noise experience includes: sound level monitoring in the field; noise-impact modeling; evaluating compliance with noise-related community plans, policies, and ordinances; and developing specific mitigation measures to reduce noise from construction and operation of a project.

Aspen Environmental Group **June 2001 to present**

Mr. Birdsall's project experience at Aspen includes the following:

Initial Technical Studies for CEC Contract - Review of Power Plant AFCs: Mr. Birdsall will assist Aspen as a technical specialist for the California Energy Commission (CEC) contract to review Applications for Certification (AFC) for all new power plants throughout California.

PREVIOUS EMPLOYMENT **1994 to June 2001**

As a Senior Environmental Engineer at EIP Associates (EIP), Mr. Birdsall performed comprehensive noise impact analyses for Environmental Impact Reports/Statements and independent technical reports. Selected projects at EIP include:

Allegro Jack London Square Project, SNK Development. Provided expert testimony on the construction noise effects on residence in a revitalized, high-density City of Oakland neighborhood. Conducted field surveys of construction noise with City Staff and evaluated compliance with City noise ordinance.

Bay Area Rapid Transit District, Oakland Airport Connector EIS/EIR. Conducted a noise impact evaluation and developed mitigation strategies for automated guideway transit system and heavy bus route alternatives. Conducted community noise monitoring and assessments according to Federal Transit Administration (FTA) methodology. Specific measures were developed to reduce the noise impact levels.

Presidio Trust Implementation Plan EIS and Letterman Complex Supplemental EIS. Prepared community noise impact assessment and developed noise mitigation strategies for the project. Identified noise source issues for national monuments and places of serenity using federal noise assessment criteria within an urban park setting.

Maranatha High School and Playing Fields Project, City of Sierra Madre. Prepared the community noise technical study for a new private high school with outdoor amphitheater and athletic facilities. Characterized noise from events to determine impact level on sensitive residential community.

State Route 275 Modification Project, City of West Sacramento. Prepared noise technical studies on the realignment of the State Route 275 Modification Project. Required assessment of new traffic noise impacts

DECLARATION OF
DR. OBED ODOEMELAM

I, **Obed Odoemelam** declare as follows:

1. I am presently employed by the California Energy Commission in the **ENVIRONMWNTAL OFFICE** of the Systems Assessment and Facilities Siting Division as a **STAFF TOXICOLOGIST**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **TRANSMISSION LINE SAFETY AND NUISANCE** for the **RUSSELL CITY POWER PROJECT** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/10/02 Signed: Odoemelam

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989-
The Present California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF
Daniel Gorfain

I, **Daniel Gorfain,** declare as follows:

1. I am presently employed by the California Energy Commission, via Aspen Environmental Group, in the Socioeconomics Unit of the Energy Facilities Siting and Environmental Protection Division as a Senior Associate.

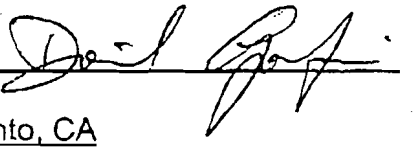
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the Socioeconomics staff testimony for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related to Socioeconomics in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/02 Signed: 

At: Aspen Environmental Group, Sacramento, CA

Daniel Gorfain
Senior Associate
Planning/Environmental Analysis

Academic Background

M.S., Urban & Regional Planning, University of Southern California, 1968
B.S., Engineering, University of California, Los Angeles, 1966

Professional Experience

Mr. Gorfain has extensive experience in manages and prepares environmental documents under CEQA and NEPA for complex multidisciplinary projects, including large-scale energy infrastructure and development. His experience also includes analysis and management of environmental planning studies, involving extensive inter-governmental coordination and community involvement, as well as the legislative policy and budget process.

Aspen Environmental Group **June 2001 - Present**

- **California Energy Commission, Technical Assistance in Application for Certification Review.** In response to California's power shortage, Aspen is assisting the California Energy Commission in evaluating the environmental and engineering aspects of new power plant applications throughout the State. As part of this effort, Mr. Gorfain is currently preparing socioeconomic and environmental justice analyses for the following power plant projects:

  - **Russell City Energy Center, Hayward, CA**. Socioeconomics/ Environmental Justice Staff Assessment for a 600-megawatt Russell City natural gas-fired power plant and Advanced Water Treatment facility.

  - **Colusa Power Plant Project, Colusa County, CA.** Socioeconomics/ Environmental Justice Staff Assessment for a 500-megawatt combined-cycle power plant

  - **Los Esteros Critical Energy Facility, San Jose, CA.** Socioeconomics/ Environmental Justice Staff Assessment for a 180-megawatt natural gas-fired simple cycle peaking plant.

California State Lands Commission. **1978 - 1993 and 1996 - May 2001**

Responsible for the management and review of a broad range of multi-disciplinary environmental impact studies on technically complex and politically sensitive plans and projects, involving multiple local, State and federal governmental agencies and extensive participation by public and private special interests. Issues ranged from consistency with land use plans and ordinances to community impacts such as socioeconomic, environmental justice, public services, air and water quality, geology, seismic safety and system safety and reliability.

- **Questar Southern Trails Pipeline Project, New Mexico to Long Beach, CA.** Managed the preparation of a Joint EIR/S for the conversion of an existing oil pipeline for the transportation of natural gas. The process included extensive engineering evaluation, seismic hazard/system safety analysis, biological assessments of the pipeline route, development of a Mitigation Monitoring Program and preparation of a Statement of Overriding Considerations.

DECLARATION OF
Joseph A. Crea

I, **Joseph A. Crea,** declare as follows:

1. I am presently employed by the California Energy Commission, via Aspen Environmental Group, in the Water and Soil Resources Unit of the Energy Facilities Siting and Environmental Protection Division as a Senior Technical Specialist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil and Water Resources, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related to Soils and Erosion and Sediment Control in the testimony, and if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/02 Signed: Joseph A. Crea

At: Aspen Environmental Group, Sacramento, CA

JOSEPH A. CREA
Environmental Scientist

ACADEMIC BACKGROUND

B.S. (Magna Cum Laude), Agronomy/Environmental Science
Delaware Valley College of Science & Agriculture, 1994.

PROFESSIONAL EXPERIENCE

Joseph A. Crea, BS (Soils/Environmental Science) has over seven years of experience in the fields of erosion control, hydrology and water quality. His experience with County Conservation Districts (New Jersey and Pennsylvania) entailed interacting with government and private sectors that dealt with environmental issues (land/water) related to erosion control. He reviewed and processed numerous NPDES (National Pollution Discharge Elimination System) Permits for Stormwater Discharge from Construction activities. He has also served as an Erosion Control Specialist where he reviewed and designed private and government erosion control plans for adequacy and conducted routine site inspections.

He has received extensive training from the PA Department of Environmental Protection and the International Erosion Control Association in hydrology/hydraulics, erosion control/revegetation, bioengineering, and the NPDES permitting process. In addition, he received training from the Army Corps of Engineers in "Basic Wetland Identification." Joseph also completed a training course in geo-fluvial morphology offered by the University of California.

Aspen Environmental Group **April 2000-Present**

Soil and Water Assessments of Infrastructure Projects:

- Yellowstone Pipeline: Changes to the existing Yellowstone Pipeline between Thompson Falls, Montana and Kinston, Idaho – ongoing
- San Luis Rey Flood Control Project – ongoing
- Clean Water Act 404 (B)(1) Water Quality Evaluation for Murrieta Creek Flood Control Project
- Tucson Drainage Design Refinement Plan – ongoing
- Marine Corps Recruiting Depot Recreational Expansion - ongoing
- Imperial Beach Erosion Remediation - ongoing

Soil and Water Assessments of Power Plant Projects:

- Western Midway Sunset Cogeneration Company Project (99-AFC-9) - licensed
- Mountainview Power Plant (00-AFC-2) – licensed
- Contra Costa Power Plant Unit 8 Project (00-AFC-1) – licensed
- Nueva Azalea Power Plant Project (00-AFC-3) - suspended
- Potrero Power Plant (00-AFC-4) – ongoing
- Morro Bay Power Plant (00-AFC-12) - ongoing
- El Segundo Power Redevelopment (00-AFC-14) – ongoing
- Ocotillo Energy Project (01-AFC-8) – suspended
- Russell City Energy Center (01-AFC-7) – ongoing
- Los Esteros Critical Energy Facility - ongoing

DECLARATION OF
James C. Henneforth

I, James C. Henneforth declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting and Environmental Protection Division as a consultant.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil and Water Resources, for the Russell City Energy Center based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/02 Signed: James C. Henneforth

At: Fountain Valley, California

JAMES C. HENNEFORTH

CAREER SUMMARY

Mr. Henneforth has over 33 years experience in the development, design, construction and operations of electric power generating stations. During this time he has held various positions performing engineering, operations, asset management, and business development. He has been involved with numerous types of electric generating facilities including plants fueled by gas, oil, and coal using technologies of conventional and supercritical steam, combustion turbine-combined cycle facilities, and renewable energy plants including wind and geothermal. He has been in the independent power industry providing skills in the development and acquisition of power plants since the early 1980's. He has held management positions with responsibilities for development of new facilities including setting project objectives, securing and administering power sales agreements, handling regulatory matters, defining project scope and technical requirements, acquiring major equipment, and managing engineering and construction. Mr. Henneforth has served as Vice President and Chief Technical Officer of Mission Energy, a subsidiary of Edison International, as well the Vice President and General Manager for Mission's European Region. Since 1996 Mr. Henneforth has provided consulting to the power industry having co-founded the consulting firm of Pacific Group Electric Power, LLC. Projects have included support of acquisition of 1600 Mw of coal facilities in China, development of combustion turbine/combined cycle projects, review of new projects for the California Energy Commission, and project assessments for the California Department of Water Resources.

PROFESSIONAL EXPERIENCE

Pacific Group Electric Power, LLC (1996-Present)
Principal

Founding partner in consulting firm providing technical and business consulting services to the electric power industry. Services include technical and commercial due diligence, contract development, engineering and project management, plant assessment, and dispute resolution. Clients include independent power producers, consulting firms, and regulatory agencies. In addition to providing services directly to project developers and independent power producers Mr. Henneforth has supported the California Energy Commission in permitting of new electric power generating facilities in the Sate of California. CEC project reviews have included Mountainview, Contra Costa, Potrero, Morro Bay, Western Midway Sunset, Moss Landing, and Modesto Irrigation District.

Edison Mission Energy (1986-1996)

Vice President and Chief Technical Officer (1995-1996)

Directed managers of corporate assets in the Western US, including 16 operating facilities totaling 1665 MW of electric generation. Responsibilities included management of power sales, plant operations, fuel acquisition, regulatory compliance, budget, profit and loss accountability.

Responsibilities also included management of corporate engineering function and construction support to all worldwide regional locations. Provided technical and Project Management overview to verify design and equipment selection suitability, engineering and construction contracting and new business opportunity due diligence reviews.

Vice President and General Manager of Europe (1994-1995)

Mission Energy's corporate officer responsible for the European Operations in their London Regional Office. Responsibilities included defining business strategies, leading regional marketing efforts, and development of opportunities for power generating facilities throughout Europe, the Middle East, and North Africa. Provided management for operations of electric generating plants located in the UK.

Vice President of Project Management (1990-1994)
Manager of Project Management (1986-1990)

Responsible for the engineering and construction of new electric generating projects both domestically and internationally. Managed Project Managers performing project evaluations, engineering, procurement, construction, and commissioning of power plants fueled by natural gas, oil, and coal. Generating facilities included combustion turbine, combined cycle, cogeneration, pulverized coal, and geothermal. During this period Mission developed and constructed some 30 plants worldwide. During part of this period Mr. Henneforth was the Executive Director for the Harbor Cogeneration Company and provided day-to-day management for the engineering, construction and operation of this project located near the Port of Long Beach, California.

SOUTHERN CALIFORNIA EDISON (1969-1986)

Mr. Henneforth held various positions in management and engineering including the Project Manager for a 300MW cogeneration plant and Engineering Manager for a 100 MW coal gasification facility. He was the Project Engineer for numerous projects including retrofits to multiple Edison power plants and development of combustion turbine and combined cycle facilities. Additionally, he worked as a Plant Engineer at a 1600 MW gas/oil fired electric generating station that included two supercritical units.

DECLARATION OF
John S. Kessler

I, **John S. Kessler,** declare as follows:

1. I am presently employed by the California Energy Commission in the Water and Soil Resources Unit of the Energy Facilities Siting and Environmental Protection Division as a Senior Technical Specialist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil and Water Resources, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/02 Signed: John S. Kessler

At: Pollock Pines, California

JOHN S. KESSLER
Kessler and Associates, LLC
2801 Shady Lane
Pollock Pines, CA 95726
Ofc: (530) 644-2010, Fax: (530) 644-2051
Email: zephyr@plv1.innercite.com

EMPLOYMENT HISTORY:

May 2000 - Present: Principal - Kessler and Associates

Established Kessler and Associates to provide engineering, regulatory and operating services related to energy and associated water supply projects;

CEC - Valero Cogeneration Project, 01-AFC-05
Serving as Project Manager for the Soil and Water Resources Section in a 4-month certification proceeding of two combustion turbine generators rated at 51 MW each;

CEC - East Altamont Energy Center, 01-AFC-6
Serving as Project Manager for the Soil and Water Resources Section in a 12-month certification proceeding of a natural gas-fired, combined cycle generating facility rated at 1,100 MW;

CEC - Russell City Energy Center, 01-AFC-7
Serving as Project Manager for the Soil and Water Resources Section in a 6-month certification proceeding of a natural gas-fired, combined cycle generating facility rated at 600 MW;

CEC - Baldwin Hills, 01-EP-11
Served as a Soil and Water Resources Specialist in the 21-Day Emergency Peaker certification proceeding of two combustion turbine generators rated at 25 MW each;

CEC - Water Discharge Assessment of Coastal Power Plants – Executive Order 22-01
Served as Project Manager of Water Resources to assess the generation curtailments resulting from regulatory-required cooling water discharge limitations at various coastal thermal power plants;

CEC - Environmental Performance Report of California's Electric Generation Facilities
Co-authored the Water Resources Section, providing research and analysis of trends in power plant water resource utilization affected by technological changes, improved environmental safeguards, regulatory influences in market development, and diminishing supplies of fresh water;

CPUC – EIR for PG&E's Application for Authorization to Divest its Hydroelectric Generating Facilities and Related Assets
Served as Hazards Section Leader and Team Member of the Public Services and Utilities Section in preparing the EIR for considering PG&E's divestiture of its entire hydroelectric system;

Utica Power Authority – Dam Safety and Regulatory Compliance Services
Serving as UPA's Dam Safety Engineer and advising on various regulatory matters, including preparing a comprehensive regulatory checklist and schedule for compliance monitoring of applicable federal, state and local regulations and agreements.

DECLARATION OF
JOHN SCROGGS

I, John Scroggs, declare as follows:

1. I am presently employed by the California Energy Commission in the Water and Soil Resources Unit of the Energy Facilities Siting and Environmental Protection Division as a Senior Technical Specialist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil and Water Resources for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/10/2 Signed: _____

At: Sacramento, California

CONSULTING
KASL
ENGINEERS

JOHN C. SCROGGS, P.E.
PRINCIPAL

John C. Scroggs is a Principal of the firm, a Registered Civil Engineer and Registered Traffic Engineer with over 23 years of experience in municipal engineering projects. For projects conducted by **KASL Consulting Engineers**, Mr. Scroggs has served as Project Manager and has directly participated in the planning, design and construction management of water supply and water and wastewater treatment projects; transportation projects; site facilities for industrial, commercial and residential developments; and the preparation of hydrologic and hydraulic studies.

WATER SUPPLY AND WATER AND WASTEWATER TREATMENT

Mr. Scroggs has been responsible for all water and wastewater projects completed by **KASL Consulting Engineers** for both public and private sector clients. Planning and design of water supply projects have encompassed pumping plants, transmission mains, storage tanks and conveyance facilities. Mr. Scroggs has extensive experience in designing and constructing proven water and wastewater treatment and conveyance systems and is also knowledgeable of the latest technologies in these fields. Mr. Scroggs has served as Project Manager and has been directly involved in the design and construction management of the following projects:

Water Supply, Pumping and Treatment Facilities

- Copper Cove Water Master Plan
- Copper Cove Water Treatment Plant
- Copper Cove / Lake Tulloch Raw Water Facilities
- Jenny Lind Water Treatment Plant Expansion
- New Hogan / La Contenta Sewer and Water Assessment District (water treatment plant, storage tank and booster pump station)
- La Contenta Domestic Water Storage and Transmission
- Jenny Lind Water Storage Tanks and Transmission Mains
- New Hogan Lake Estates Booster Pump Station
- La Contenta Irrigation Water Supply Pumping Facility
- Horseshoe Bay Estates Water Treatment Facilities Expansion
- Camp Far West North Side Water Treatment Plant
- Camp Far West Water Intake, Transmission and Pumping Project
- Cave Rock / Skyland Water Treatment Plant
- Cave Rock / Skyland Water Mains, Pump Station & Storage Tanks
- Placer County Water Agency Zone 3 Water Improvements (Alta, Monte Vista and Colfax)

DECLARATION OF
Fred Choa, P.E.

I, **Fred Choa** declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Energy Facilities Siting and Environmental Protection Division as an **Associate Engineer.**

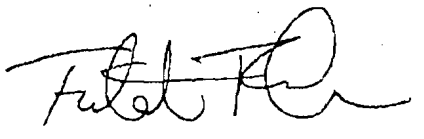
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Traffic & Transportation**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/14/2002 Signed: 

At: Sacramento, California

DECLARATION OF
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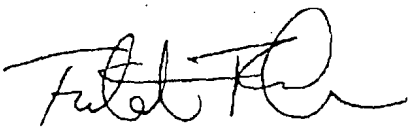
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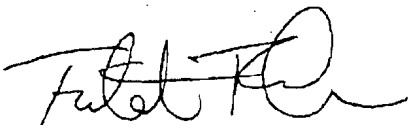
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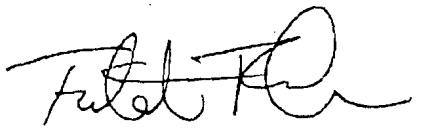
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At: Sacramento, California

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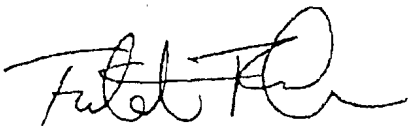
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I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/14/2002 Signed: 

At: Sacramento, California

DECLARATION OF
Fred Choa, P.E.

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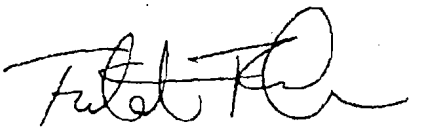
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I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/14/2002 Signed: 

At: Sacramento, California

DECLARATION OF
AJOY GUHA

I, **Ajoy Guha,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Transmission System Engineering unit** of the Systems Assessments and Facilities Siting as an Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission System Engineering**, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5-29-02 Signed: A. Guha

At: Sacramento, California

RESUME

AJOY GUHA

Associate Electrical Engineer
California Energy Commission
1516 Ninth Street, MS 46
Sacramento, CA 95814

EDUCATION:

MSEE, POWER SYSTEMS ENGINEERING, PURDUE UNIVERSITY, INDIANA
BSEE, ELECTRICAL ENGINEERING, CALCUTTA UNIVERSITY, INDIA

CERTIFICATIONS: .

REGISTERED PROFESSIONAL ENGINEER, CALIFORNIA, INDIANA & ILLIINOIS
MEMBER OF IEEE; MEMBER OF THE INSTITUTION OF ENGINEERS OF INDIA

SUMMARY OF PROFESSIONAL BACKGROUND:

Ajoy Guha, P. E. has 34 years of electric utility experience with an extensive background in evaluating and determining current and potential transmission system reliability problems and their cost effective solutions. He has a good understanding of the transmission issues and concerns. He is proficient in utilizing computer models of electrical systems in performing power flow, dynamic stability and short circuit studies, and provide system evaluations and solutions, and had performed generator interconnection studies, area transfer and interconnected transmission studies, and prepared five year transmission alternate plans and annual operating plans. He is also experienced in utilizing Integrated Resource Planning computer models for generation production costing and long term resource plans, and had worked as an Executive in electric utilities and experienced in construction, operation, maintenance and standardization of transmission and distribution lines.

WORK EXPERIENCE:

CALIFORNIA ENERGY COMMISSION, ENERGY FACLITIES SITING AND ENVIRONMENTAL DIVISION, SACRAMENTO, CA, 11/2000-Present.
Working as Associate Electrical Engineer in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies and their impacts on transmission system, and providing staff assessments and testimony to the commission, and coordination with utilities and other agencies.

ALLIANT ENERGY, DELIVERY SYSTEM PLANNING, MADISON, WI, 4/2000-9/2000.
Worked as Transmission Services Engineer, performed Generator Interconnection studies and system planning studies.

IMPERIAL IRRIGATION DISTRICT, POWER DEPT., Imperial, California, 1985-1998.
Worked as Senior Planning Engineer in a supervisory position and in Transmission, Distribution and Integrated Resource planning areas. Performed interconnection studies for 500 MW geothermal plants and developed plan for a collector system, developed methodologies for transmission service charges , scheduling fees and losses. Worked as the Project Leader in the 1992 Electricity Report (ER 92) process of the California Energy Commission. Worked as the Project Leader for installation of an engineering computer system and softwares. Assumed the Project Lead in the standardization of construction and materials, and published construction standards.

CITY LIGHT & POWER, Frankfort, Indiana, 1980 – 1985.
Worked as Assistant Superintendent and managed engineering, construction and operation depts.

WESTERN ILLINOIS POWER CO-OP., Jacksonville, Illinois, 1978 – 1980.
Worked as Planning Engineer and was involved in transmission system planning.

THE CALCUTTA ELECTRIC SUPPLY CORPORATION LTD. (CESC), Calcutta, India, 1964 –1978.
Worked as District Engineer and was responsible for managing customer relations, purchasing and stores, system planning, construction, operation and maintenance departments of the most industrialized Transmission and Distribution division of the Utility. Worked as PROJECT MANAGER for construction of a 30 mile Double Circuit 132 kV gas-filled Underground Cable urban project. During 1961-63, worked as Factory Engineer for design, manufacturing and testing of transformers, motor starters and worked in a coal-fired generating plant.

DECLARATION OF
Stuart Itoga

I, **Stuart Itoga,** declare as follows:

1. I am presently employed by the California Energy Commission in the Biological Resources Unit of the Energy Facilities Siting and Environmental Protection Division as an Energy Analyst.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Biological Resources, for the **Russell City Energy Center** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/20/02 Signed: Stuart Itoga

At: Sacramento, California

STUART ITOGA
Energy Analyst

EDUCATION

B.S. Degree in Wildlife Management, Humboldt State University, Arcata, CA. December 1995.

A.A. Degree in Liberal Arts, West Valley College, Saratoga, CA. June 1991.

Post Graduate Education, Humboldt State University, Arcata, CA. August 1997- August 1998.

EXPERIENCE

Energy Analyst, California Energy Commission, March 2001- Present. Currently assigned to the Systems Assessment and Facilities Siting Division, Biological Resources Unit, participating in the certification of thermal power plants. Through the review of project data, workshops and data requests, assess the potential impacts to biological resources associated with proposed projects and prepare written testimony.

Fish and Wildlife Technician, California Department of Water Resources, March 2000-March 2001. Coordinated the removal and repair of various fish screens throughout the south delta. Prepared a study plan for a corrosion and biomass accumulation study comparing different materials used for fish screens. Participated in various studies including stable isotopes, habitat use of the Chinese mitten crab and population studies of delta smelt, splittail and chinook salmon.

Biological Science Technician, U.S. Forest Service, June 1996-September 1999. As one of two field biologists assigned to an interagency black bear population study, utilized radio telemetry techniques and GPS technology to track and capture black bears in northern California. I was the principal investigator for a survey of sylvatic plague in Siskiyou County, California.

Fish and Wildlife Scientific Aid, Department of Fish and Game, February 1996-August 1997. Assisted with habitat management for breeding and wintering waterfowl and shorebirds. Conducted various sensitive species surveys and provided informational services to the public. Began working on black bear population study in the summers of 1996 and 1997.

Biological Science Technician, National Biological Service, March 1995-February 1996. Participated in a Mourning dove nesting ecology study and assisted in the design and implementation of a waterfowl behavioral study.

Wildlife Assistant, Humboldt State University, October 1993-January 1995. Assisted in a red fox and fisher food habits study and assisted with the operation of a MAPS mist netting station.

Biological Science Technician, U.S. Forest Service, May-August 1994. Acted as the fisheries crew leader collecting data to assess the effects of cattle grazing on riparian areas. Also prepared a report on the effects of a fire retardant spill on endemic fish species.

DECLARATION OF
Eric Knight

I, Eric Knight declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting and Environmental Protection Division as a Planner II.

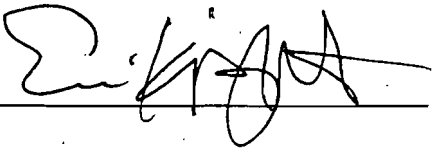
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Visual Resources, for the Russell City Energy Center based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/20/02 Signed: 

At: Sacramento, California

ERIC KNIGHT

Planner II

EDUCATION

BA – Environmental Studies, California State University, Sacramento, 1993
Minor – Government, CSUS, 1993

PROFESSIONAL EDUCATION

CEQA Workshop, Association of Environmental Professionals, February 1999
CEQA Overview and Update, UC Davis Ext. Program, June 1998
Land Use Planning for Environmental Professionals, UC Davis Ext., May 1996
Introduction to ArcView and Avenue (GIS), ESRI, August 1995 and May 1998

EXPERIENCE

June 2000 to present

California Energy Commission, Systems Assessment & Facilities Siting Division, Environmental Protection Office
Planner II (Planner I between 10/98 – 6/00)

Responsible for conducting, or overseeing the development of, independent analyses of the potential visual, land use, and traffic impacts of power plant proposals. Other responsibilities include reviewing applications for data adequacy, participating in workshops with applicants and the public, preparing written testimony, and presenting testimony at hearings.

June 1995 – October 1998

California Energy Commission, Energy Facilities Siting & Environmental Protection Division, Engineering Office
Energy Analyst/Planner I

Helped to advance local governments' use of urban planning tools. Developed a GIS database and analytical tool for a community-planning project in San Diego. Authored a chapter to the National Wind Coordinating Committee's *Permitting of Wind Energy Facilities: A Handbook*. Helped to write, edit and review various Energy Commission publications.

June 1994 – June 1995

Department of Toxic Substances Control, California EPA
Program Technician
(Student Assistant: March 1993 – January 1994)

Provided regulatory assistance to hazardous waste generators, transporters and storage facility operators.

January 1992 – June 1992

Sacramento Valley Toxics Campaign
Student Intern

Filed public record requests with state and federal agencies. Conducted research and authored an article for the campaign newsletter. Helped to organize community meetings, press conferences and public outreach events.

DECLARATION OF
Roger Mason

I, **Roger Mason** declare as follows:

1. I am presently employed by Chambers Group, Inc. as a Cultural Resources Consultant working as a subcontractor to Aspen Environmental Group, a contractor to the California Energy Commission's Energy Facilities Siting and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Cultural Resources for the Russell City Energy Center based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 19, 2001 Signed: Roger Mason

At: Sacramento, California

ROGER D. MASON, PH.D.
DIRECTOR OF CULTURAL RESOURCES

EDUCATION

Ph.D., Anthropology (Archaeology), University of Texas at Austin
B.A., Anthropology, University of Washington

PROFESSIONAL AFFILIATIONS AND CERTIFICATIONS

- Registered Professional Archaeologist (RPA)
- Orange County Certified Archaeologist
- Riverside County Qualified Archaeologist
- American Anthropological Association
- Society for American Archaeology
- Society for California Archaeology
- Pacific Coast Archaeological Society

REPRESENTATIVE PROJECT EXPERIENCE

- **Power Plant Certification Projects in California – Aspen Environmental Group / California Energy Commission.** Served as cultural resources consultant to the California Energy Commission for the following power plant projects: Huntington Beach, Modesto, Potrero (San Francisco), Rio Linda (Sacramento), East Altamont (Livermore), Russell City (Hayward), and Inland Empire (Perris-Hemet). Reviewed Applications for Certification, submitted Data Requests, attended workshops, wrote cultural resources sections of staff assessments.

- **NEPA Compliance Environmental Documentation for Installation and/or Modification of Digital Cellular Telephone Communication Facilities throughout Southern California – Pacific Bell Wireless.** Directed cultural resources studies for this large-scale program. Records searches and field surveys were conducted, and reports prepared, to document potential impacts on cultural resources for over 500 cellular communications facilities throughout southern and central California.

- **Environmental Services for California Segments of Nationwide Fiber Optic Cable Network - Confidential Client.** Managed cultural resources studies for this large-scale project, which entailed a full range of environmental permitting services in support of a nationwide fiber optic network installation project. The new fiber optic network will cross 40 states and serve 50 U.S. cities, with a total of 15,000 miles of fiber optic network. Approximately 75 percent of the buried fiber optic cable system will be located within railroad right-of-ways, with the rest to be located within highway right-of-ways and limited private land. The project completion date goal is the end of 2001. Responsibilities include records searches, cultural resources surveys, subsurface testing, data recovery, and construction monitoring in central and southern California. Also prepared cultural resources sections for CEQA Preliminary Environmental Assessments for construction of off-right-of-way facilities throughout California were also being prepared.

- **Putuidem (CA- ORA-855) Data Recovery Program** – Archon Group. Co-Principal Investigator – Designed and implemented a data recovery program at a Juaneno village site in San Juan Capistrano dating to the Late Prehistoric Period. Previous work at the site had been performed by field schools from Cypress College over a 15 year period. The data recovery program was designed to complete mitigation of impacts so that the property could be developed. All work was coordinated with and monitored by the Juaneno Band of Mission Indians. The final report incorporated data from the field schools and the data recovery program and included ethnohistoric information about the site.