

Staff Assessment - Part 1

RUSSELL CITY ENERGY CENTER

Amendment No. 1 (01-AFC-7C)
Alameda County



**CALIFORNIA
ENERGY
COMMISSION**

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STAFF REPORT

APRIL 2007
(01-AFC-7C)
CEC-700-2007-005-PT1



Arnold Schwarzenegger, Governor

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**CALIFORNIA
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**RUSSELL CITY ENERGY CENTER AMENDMENT #1
(01-AFC-7C)
STAFF ASSESSMENT – PART 1**

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EXECUTIVE SUMMARY

Jeri Zene Scott, Project Manager

INTRODUCTION

On November 17, 2006, the project owner filed a petition with the California Energy Commission to amend the Commission Decision to change the location for the Russell City Energy Center (RCEC). The 600 megawatt project was certified by the Energy Commission on September 11, 2002, to be constructed at a site at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street. Without a power purchase agreement, project construction was never initiated. The project owner now has a power purchase agreement with Pacific Gas and Electric and is requesting approval to move the project to the new site between Depot Road and Enterprise Avenue, approximately 1,300 feet from the original site. The project owner expects to begin construction in the second quarter of 2008. The project would still be located in the City of Hayward, in Alameda County.

The purpose of the Energy Commission's amendment review process in this Staff Assessment (SA) is to assess the direct, indirect and cumulative impacts of the amendment on the environment, public health and safety, and the electric transmission system. The SA presents the conclusions, recommendations, and proposed conditions of certification that staff believes are necessary to mitigate or avoid potential significant adverse environmental impacts and to satisfy laws, ordinances, regulations and standards (LORS) that have changed since the original project was certified.

The review process includes an evaluation of the consistency of the proposed changes with the Energy Commission's Decision and with current applicable LORS (Title 20, Calif. Code of Regulations, section 1769).

Staff Assessment (SA) Part 1 contains the Energy Commission staff's evaluation of the technical areas that include: biological resources; hazardous material management; noise and vibration; socioeconomic resources; soil and water resources; transmission line safety and nuisance; worker safety and fire protection; facility design; geology and paleontology; power plant efficiency; power plant reliability; and transmission system engineering.

In an effort to improve the project schedule, Energy Commission staff consulted the project owner and advised the Commission Committee overseeing this proceeding that the SA for the Russell City Energy Center (RCEC) amendment will be bifurcated. Part 1 of the SA will include those technical areas that involve little change from staff's analysis of the original RCEC. The remaining technical areas will be included in Part 2 because: 1) additional information is required from the project owner, 2) agency comment is required, 3) issues need to be resolved with a local agency, and 4) staff resource limitation in certain technical areas prevented completion of the analyses.

Part 2 will include: Air Quality, Cultural Resources, Land Use, Public Health, Traffic and Transportation, Visual Resources, Waste Management and Alternatives.

PROJECT LOCATION AND DESCRIPTION

The Energy Commission certified the construction and operation of the RCEC in September 2002, on 14.7 acres in the City of Hayward (the City) Industrial Corridor at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City's Water Pollution Control Facility (WPCF). The location is approximately two miles from the east entrance to the San Mateo-Hayward Bridge (State Route 92).

Through the Petition to Amend, the project owner is now proposing to locate the facility directly west of the City's WPCF between Depot Road and Enterprise Avenue, approximately 1,300 feet northwest of the original location (300 feet boundary to boundary). The new location will total approximately 18.8 acres with parcels presently in both the City and unincorporated Alameda County.

The proposed amendment includes numerous minor adjustments to the site layout such as equipment additions, subtractions, and new equipment locations.

A more complete description of the project, including a description and maps of the proposed upgrades to the transmission, water, and natural gas pipeline systems, is contained in the **Project Description** section of this SA. (**See Project Description Figure 1 & 2**)

NECESSITY FOR THE PROPOSED MODIFICATIONS

The project owner requested the proposed modifications because following the certification of RCEC, portions of the original project location were no longer feasible to acquire. Additionally, property became available that was not previously available in a location that would reduce environmental impacts.

Specifically, with the new location there would be no need to move the KFAX radio towers, thus eliminating the impact on a seasonal wetland and the endangered salt marsh harvest mouse located on that parcel. Further, the proposed relocation eliminates the impact that would have occurred from relocating the KFAX radio towers adjacent to East Bay Municipal Regional Park District facilities and a Hayward Shoreline Regional Park trailhead. Visually, the new location reduces visual impacts from State Route 92 and the Hayward Shoreline Interpretive Center, and eliminates the need for an architectural screen.

PROJECT FUNDING AND OWNERSHIP

Russell City Energy Company, LLC, a wholly owned subsidiary of Calpine Corporation (Calpine) and GE Energy Financial Services (GE), is the project owner. On August 11, 2006, Calpine and GE entered into a Letter of Intent agreement that provides for GE to become a 35 percent equity partner in the project.

SUMMARY OF TECHNICAL AREAS

Executive Summary table below shows all the technical areas contained in Part 1 and also indicates where staff has recommended changes to the existing RCEC license and conditions of certifications. Staff believes that by requiring the changes to the existing conditions, the potential impacts of the proposed relocation will be reduced to less than significant levels. The details of the proposed condition changes can be found under their appropriate technical headings in this SA.

Executive Summary Table
Summary of Technical Sections Conditions of Certification

Technical Area	Changes to Conditions of Certification	Technical Area	Changes to Conditions of Certification
Biological Resources	Yes	Worker Safety/Fire Protection	Yes
Hazardous Materials Mgmt.	Yes	Facility Design	Yes
Noise and Vibration	Yes	Geology and Paleontology	Yes
Socioeconomic Resources	Yes	Power Plant Efficiency	No
Soil and Water Resources	Yes	Power Plant Reliability	No
Transmission Line Safety and Nuisance	No	Transmission System Engineering	Yes

STAFF RECOMMENDATIONS AND CONCLUSIONS

Commission staff will provide its recommendations and conclusions in Part 2 of the SA, when the amendment request has been fully analyzed for all technical areas.

INTRODUCTION

Jeri Zene Scott

PURPOSE OF THIS REPORT

The Staff Assessment (SA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Russell City Energy LLC's (RCEC) Amendment No.1. This SA is a staff document. It is neither a Committee document, nor a draft decision. This SA is Part 1 which will be followed by Part 2 within a few weeks.

The SA describes the following:

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

The technical area analyses contained in this SA are based upon information from: 1) the Commission Decision; 2) Petition to Amend; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research. The analyses for most technical areas include discussions of proposed changes and additions to the 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 staff's method of ensuring post-certification compliance with adopted requirements.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq. and Title 20, California Code of Regulation section 1701 et seq. (specifically section 1769 pertaining to amendments), and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

Section 1769(a)(3) authorizes the Commission's approval of the amendment petition if it can make the following findings:

- (A) The findings specified in section 1755 (c) [whether all significant environmental impacts can be mitigated or avoided], and (d) [if all significant impacts cannot be avoided, overriding considerations justify approving the amendment], if applicable;
- (B) That the project would remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25525;
- (C) The change will be beneficial to the public, project owner, or intervenors; and
- (D) There has been a substantial change in circumstances since the Commission certification justifying the change or that the change is based on information that was not available to the parties prior to Commission certification.

The SA contains an Executive Summary, Introduction, Project Description, and the environmental, engineering, and public health and safety analysis of the proposed amendment. The technical areas included in Part 1 of the SA are as follows: biological resources; hazardous material management; noise and vibration; socioeconomic resources; soil and water resources; transmission line safety and nuisance; worker safety and fire protection; facility design; geology and paleontology; power plant efficiency; power plant reliability; and transmission system engineering.

Each of the technical area assessments includes a discussion of:

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

Staff has added new conditions of certification and in some cases modified or deleted some of the existing conditions of certification contained in the Commission Decision for the RCEC. Implementing the modified and existing conditions along with the mitigation measures proposed by the project owner, will ensure that the proposed relocation and other site changes would result in no significant environmental impacts. Where conditions of certification have changed from the original Commission Decision staff displays the revised information in underline (new text) and ~~strikeout~~ (deleted text).

ENERGY COMMISSION AMENDMENT 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, §25500). The Energy Commission must review Petitions to Amend to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).

The Energy Commission's siting regulations require staff to independently review the Petition to Amend and assess whether the list of environmental impacts it contains is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, §§ 1742 and 1742.5(a)). Staff's independent review is presented in this report (Cal. Code Regs., tit. 20, §1742.5).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Staff is required to coordinate with other agencies to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification and amendment program has been certified by the Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other applicable portions of CEQA.

Staff uses Part 1 and Part 2 of the SA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the SA and an errata, staff will conduct one or more workshops to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff will refine their analyses, correct any errors, and finalize conditions of certification to reflect areas where staff has reached agreement with the parties. These refined analyses, along with responses to written comments on the SA, will be published in an errata.

The Siting Committee has oversight over compliance issues for the Energy Commission and has elected to oversee the RCEC amendment petition. All parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties at one or more Committee hearings, thereby creating a hearing record on which a decision on the amendment can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed amendment may be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. If there is a revised PMPD, it will be circulated for a comment period to be determined by the Committee. At the close of that comment period, the PMPD would be submitted to the full Energy Commission for a decision.

The Energy Commission staff has made a substantial effort to notify interested parties, encourage public participation and notify property owners within 1000 feet of the RCEC project and 500 feet of the transmission line. The Energy Commission staff has:

- Mailed Notices of Receipt on December 1, 2006, to interested parties, local libraries, responsible and trustee agencies and to property owners within 1000 feet of the RCEC project and 500 feet of the transmission line, and,
- Mailed a Notice of Public Hearing and Site Visit, which was conducted on December 15, 2006, to responsible and trustee agencies, Hayward Unified School District (Superintendent) and its 30 schools, PTA organizations in Hayward, local government and officials, property owners within 1000 feet of the RCEC project and 500 feet of the transmission line, the Hayward Public Library, as well as environmental, community-based and labor organizations.

Agency Coordination

As noted above, the Energy Commission approval 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, § 25500). However, the Commission typically seeks comments from, and works closely with, other regulatory agencies that administer LORS that may be applicable to proposed projects or would have had permitting authority except for the Energy Commission's exclusive jurisdiction to permit thermal power plant 50 megawatts or larger. These agencies include the City of Hayward, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, California Air Resources Board, Department of Toxic Substances Control, the Regional Water Quality Control Board, and the Bay Area Air Quality Management District.

PROJECT DESCRIPTION

Testimony of Jeri Zene Scott

INTRODUCTION

On November 17, 2006, the Russell City Energy Company, LLC (project owner) filed a petition with the California Energy Commission to modify the Russell City Energy Center Project (RCEC). The 600 megawatt project was certified by the Energy Commission on September 11, 2002, and is expected to begin construction in the second quarter of 2008. The facility will be located in the City of Hayward, in Alameda County.

The petition contains several modifications, the most notable being the relocation of the project facilities approximately 1300 feet northwest of the original location. All of the proposed modifications are described below.

PROJECT LOCATION

Following the completion of the certification process in September 2002, the project owner was granted permission by the Energy Commission to construct the RCEC in the City of Hayward's (the City) Industrial Corridor at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City's Water Pollution Control Facility (WPCF), approximately two miles from the east entrance to the San Mateo-Hayward Bridge (State Route 92). This location consisted of 14.7 acres and would have accommodated generation facilities, an advanced water treatment facility, control and administration building, emission control equipment, storage tanks, parking area, and storm water detention basins. One of the parcels at the original location includes four radio towers currently used for radio transmission by the KFAX-AM radio station which would have to be relocated.

The project owner is now proposing to locate the facility directly west of the City's WPCF. The facility will be adjacent to and south of Depot Road in the east Hayward industrial area. Cabot Road has its southern terminus at Depot Road across from the northeast corner of the new location. Enterprise Avenue lies to the south of the site boundary, approximately 1,300 feet northwest of the original location (300 feet boundary to boundary). The new location is approximately 1.0 mile east of the eastern shoreline of South San Francisco Bay and will total approximately 18.8 acres with parcels in both the City and a presently unincorporated area of Alameda County (County). This location consists of four parcels, three of which form an "island" of unincorporated County land in the middle of the City. These County parcels will be annexed into the City. See **Project Description Figures 1 and 2** for the local setting of this proposed location.

PROJECT FACILITIES

The proposed RCEC would 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 would have a 145-foot exhaust stack and would be equipped with duct burners for additional steam production when increased electric power generation is necessary. See **Project Description Figure 1** for the facility and equipment configuration of the proposed project.

To control emissions of air pollutants, RCEC would have gas turbines with dry, low nitrogen oxide (NO_x) burners. The units would use the best available control technology (BACT) including selective catalytic reduction (SCR) for control of NO_x. The SCR system consists of a reduction catalyst and an aqueous ammonia injection system.

AIR QUALITY EMISSIONS

The amendment proposes increases in emissions and emissions limits due to changes in turbine rated fuel capacities, fuel specifications, start-up and shutdown frequencies and durations, cooling tower water quality, and lessons learned from commissioning other combined cycle power plants. Short-term emission limits for nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs also referred to as POC), sulfur oxides (SO_x), ammonia (NH₃), and particulate matter less than 10 and 2.5 microns (PM₁₀ and PM_{2.5}) are affected by the amendment request.

However, annual emissions limits and District-required emission reduction credit quantities (offsets) are unchanged in the amendment request. The amendment proposes to modify the PM₁₀ Mitigation Plan (Energy Commission required mitigation) to include emission reduction credits as an option. The project will use the Best Available Control Technology (BACT) to control NO_x, VOCs, sulfur dioxide (SO₂), and PM₁₀/2.5 emissions.

TRANSMISSION LINE AND NATURAL GAS FACILITIES

The natural gas pipeline route and a small portion (approximately 500 to 1,000 feet) of the transmission line route would be re-located. Natural gas would be delivered to the new location via a new gas line from Pacific Gas and Electric Company's (PG&E) line 153 located along the Union Pacific Railroad easement to the east of the project. The natural gas pipeline would run entirely under Depot Road to the easement for a distance of approximately 3,800 feet (0.7 mile). Gas compressors and a metering station are located at the north end of the project site.

The proposed new 230 kV transmission line would run in the existing 115 kV Grant-Eastshore transmission corridor between the RCEC Project and the PG&E Eastshore substation. (The use of the existing PG&E corridor remains unchanged.) There are two alternatives for the new route, Alternative 1 and Alternative 2 which are shown on **Project Description Figure 2**.

Alternative 1 would extend from the RCEC switchyard east to the eastern edge of the RCEC property and then north towards Depot Road. It would then turn east and run approximately 230 feet to the existing Grant-Eastshore 115 kV corridor. The remaining portion of the generation tie-line would run parallel to the existing 115 kV line for

approximately 6,780 feet to the Eastshore substation. The entire Alternative 1 generation tie-line route from the RCEC property to the Eastshore substation would be approximately 7,010 feet (1.3 miles) long.

Alternative 2 would run from the RCEC switchyard east to the eastern edge of the RCEC property and then south to the southern edge of the RCEC property. It would then turn east and run approximately 950 feet along the southern boundary of several parcels that face Depot Road (also the northern boundary of the City of Hayward WPCF), to the Grant-Eastshore 115 kV transmission corridor. The segment from the existing Grant-Eastshore 115 kV transmission corridor to the Eastshore substation will be approximately 5,460 feet. This entire route would be approximately 6,410 feet (1.2 miles) long.

TRANSMISSION SYSTEMS IMPROVEMENTS

The original System Impact Study (SIS) for the RCEC identified impacts to the Eastshore-San Mateo 230 kV transmission line with the addition of the RCEC, and indicated that it would be necessary to re-conductor this line. The updated SIS has, in addition, identified a need for re-conductoring seven miles of the Eastshore to Dumbarton 115 kV transmission line. Permitting of these actions fall under the jurisdiction of the California Public Utilities Commission because they will take place beyond the first point of the RCEC's interconnection with the electric grid.

WATER SUPPLY AND WASTE WATER TREATMENT

The City's WPCF would provide secondary effluent for the process water supply. A Zero Liquid Discharge (ZLD) system, which would be placed to the west of the switchyard, and a Title 22 Recycled Water Facility (RWF), which would be located east of the power block, would be added to the new location to replace the proposed Advanced Water Treatment facility (AWT).

Water required for domestic uses and fire fighting would also be provided by the City through a new connection from the southern boundary of the project site to the existing 12-inch potable water line that runs along Enterprise Avenue. The quantities of water used would remain nearly the same as under the original design. The quantities of wastewater produced would decrease significantly with the addition of the ZLD system.

SITE LAYOUT

There would be numerous minor adjustments made to the site layout at the new location that can be grouped into either (1) equipment additions or subtractions and (2) new equipment locations.

Equipment additions or subtractions, compared with the project as licensed, are as follows:

- The standby generator has been removed from the project.
- The architectural treatment has been removed from the project.
- A cooling tower chemical feed pavilion has been placed south of the ZLD area, to the east of the cooling tower.
- The stormwater retention basin has been removed from the project.

- A single recycled water storage tank replaces the two final product water storage tanks.
- One of the two demineralized water storage tanks have been removed from the project.
- The cooling tower now has nine cells instead of ten cells.

The following are changes in equipment locations, compared with the project as licensed:

- The facility has been moved approximately 1,300 feet to the northwest (less than 300 feet boundary to boundary).
- The cooling tower has been realigned from a north-south orientation to a northwest-southeast orientation.
- The administration/control building area has been moved to the southwestern corner of the project site.
- The aqueous ammonia tank has moved to the southeastern corner of the project in between the eastern combustion turbine and the RWF.
- A recycled water storage tank has been placed adjacent to the northeast corner of the power block, southeast of the proposed switchyard.
- A reclaimed water storage tank has been placed adjacent to the northeast corner of the power block, south of the proposed switchyard.
- The demineralized water storage tank has been placed to the northwest of the power block, adjacent to the cooling tower.
- The fire water storage tank has been placed in the northwest corner of the power block.
- The fire pumps have been moved to the northwest corner of the power block adjacent to the fire water storage tank.
- The warehouse has been placed at the northern end of the project site.
- The fuel gas yard and compressor area has been moved to the north end of the project location, just north of the switchyard, and adjacent to the warehouse (a separate PG&E gas metering yard will be located adjacent to Depot Road). The gas compressors are now located outdoors instead of inside a building.
- The steam turbine has been moved north slightly so that it is parallel to the combustion turbines.
- The laboratory and sample panel has been separated from the administration building and is now located in an enclosure under the east-west pipe rack.

The water treatment equipment has been separated from the administration building with water treatment equipment now located in a pavilion north of the ZLD area and cycle chemical feed systems located in a pavilion east of the administration building. The unit auxiliary transformers and power distribution center are now located at the east end of the east-west pipe rack, whereas previously they were located just south of the CTG generator step-up transformers. The combustion turbine inlet air filters are now located above the generators instead of east of the respective combustion turbines.

CONSTRUCTION AND OPERATION

RCEC, LLC, proposes construction to begin on the project in the second quarter of 2008 and take approximately 25 months. Commercial operation of RCEC is expected to begin by the summer of 2010. The construction work force necessary for RCEC is expected to peak at 650 workers in month 14. 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 approximately \$600 million.

FACILITY CLOSURE

The planned life of the RCEC facility is 30 years or longer. Whenever the facility is closed, either temporarily or permanently, the closure procedures would follow the described plan provided in the Commission Decision and any additional LORS in effect at that time.

REFERENCES

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

California Energy Commission Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

California Energy Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

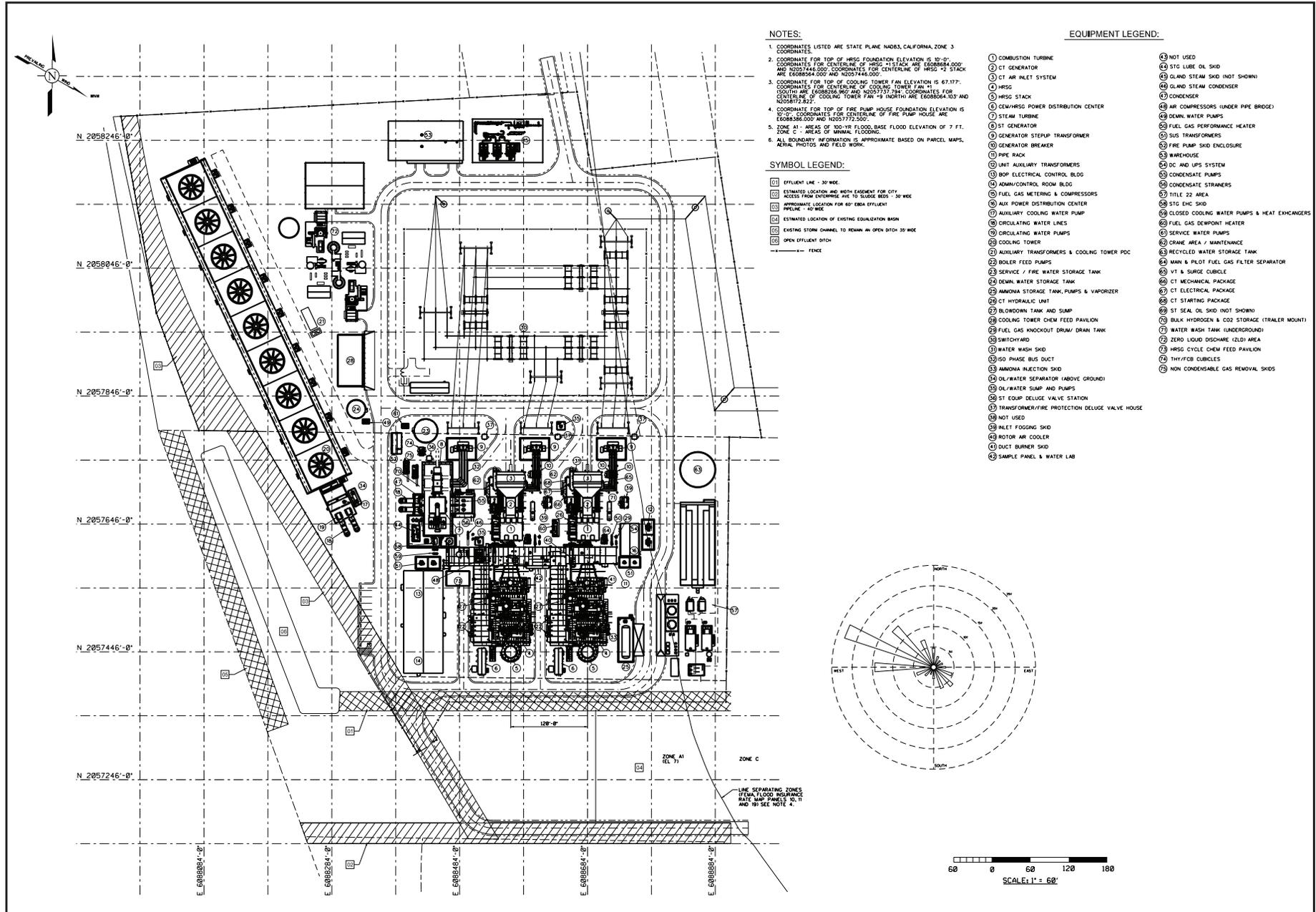
Russell City Energy Company, LLC, Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

PROJECT DESCRIPTION - FIGURE 1

Russell City Energy Center Amendment #1

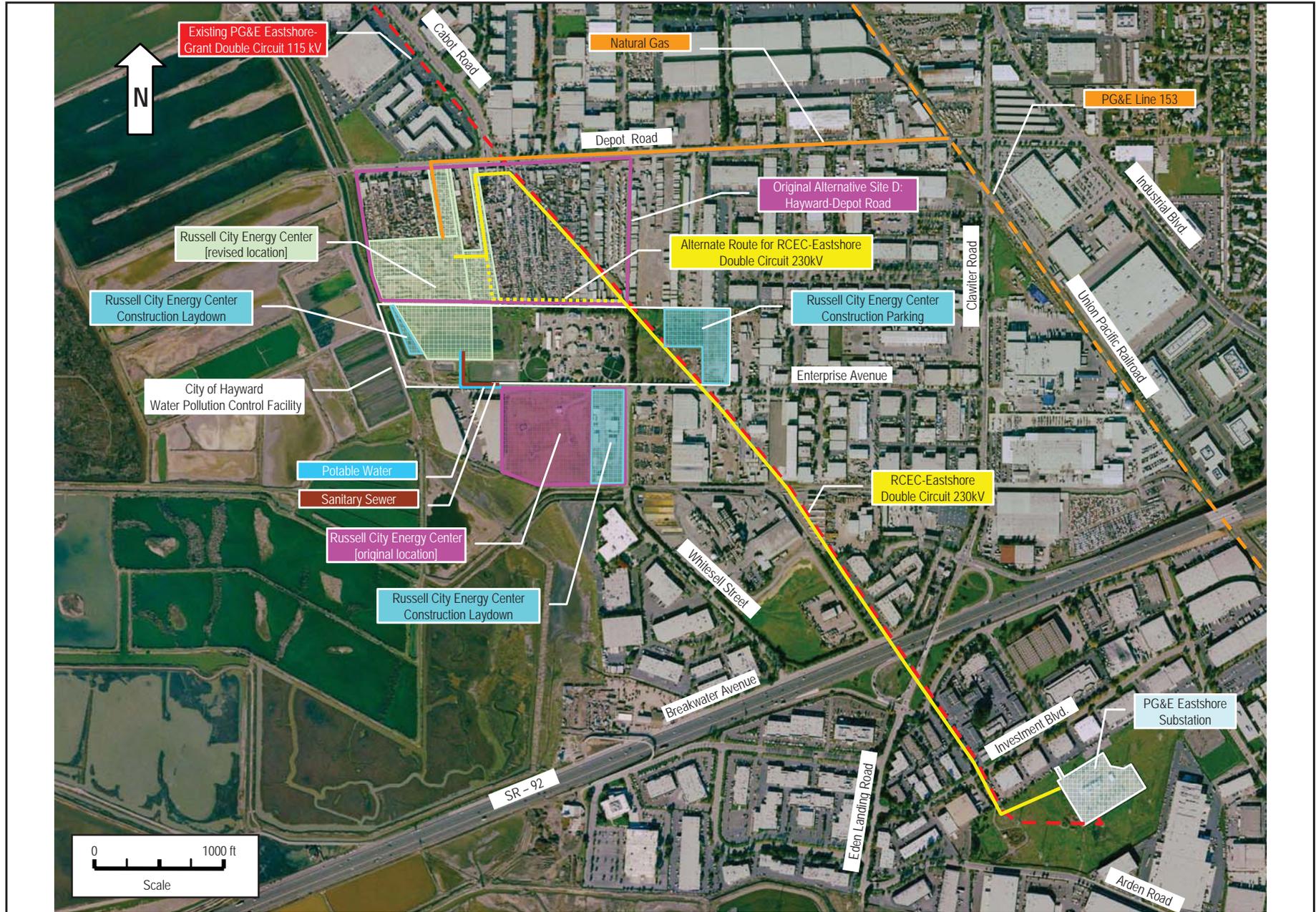
MARCH 2007

PROJECT DESCRIPTION



PROJECT DESCRIPTION - FIGURE 2
Russell City Energy Center Amendment #1

MARCH 2007



PROJECT DESCRIPTION

ENVIRONMENTAL ASSESSMENT

BIOLOGICAL RESOURCES

Testimony of Marc Sazaki

SUMMARY OF CONCLUSIONS

There would be no unmitigated impacts to biological resources because of the project changes proposed in Amendment No. 1 for the Russell City Energy Center (RCEC). The project would conform to all applicable laws, ordinances, regulations, and standards for biological resources. The new project location, as proposed, would have considerably less potential for impacts to biological resources than the project location approved in the original Commission Decision, requiring fewer mitigation measures to be implemented. Staff recommends eliminating six biological resources conditions of certification and significant changes to two other conditions.

INTRODUCTION

This analysis addresses project changes that would potentially impact biological resources in the project area. Only those aspects of the RCEC project that have changed because of the proposed amendment and that affect staff's testimony for Biological Resources as contained in the Commission Decision (Decision) dated September 11, 2002 (CEC 2002) are examined. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) The significant project changes that would affect biological resource impact potential are: 1) the new project would not encroach on wetlands; 2) a visual barrier would not be constructed, thus eliminating potential perch sites for raptors that could prey on sensitive species near the project; 3) the project would not directly impact potential sensitive species habitat, therefore no habitat compensation will be required, and 4) construction and operational noise levels would be somewhat attenuated because of increased distance from sensitive biological resources.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) - COMPLIANCE

There are no new or changed biological resource LORS that would be applicable to the amended project as proposed. Because the new project location would not impact wetlands, a federal Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers and subsequent Section 401 certification from the San Francisco Bay Regional Water Quality Control Board would not be necessary. Due to the project location change, the earlier concern that the project could impact federal protected species and their habitat has been eliminated, so the project owner would not need to acquire a federal Biological Opinion from the U. S. Fish and Wildlife Service to comply with the federal Endangered Species Act. Although a Section 401 certification related to a Section 404 permit would not be necessary, there would likely be a Section 401 certification required for the off-site stormwater discharge.

SETTING

REGIONAL

The regional setting for the new project has not changed because the new project site is approximately 1,300 feet to the north northwest of the original project site.

LOCAL

From a local perspective, the new site is different from the original location in that the new project site includes commercial/light industrial development and a sludge drying area at the Hayward Water Pollution Control Facility (WPCF). Wildlife habitat here is nonexistent to marginal at best, with only limited ruderal vegetation in a spotty distribution. Various shore birds and other avian species congregate in and around available surface waters such as abandoned salt ponds and WPCF ponds. Although the Final Staff Assessment for the original project identified significant biological resources areas to the west and southwest, the new site is further away resulting in considerably less potential for impacts on these resources. The linear facilities will initially pass through more highly developed areas than originally planned, but for the most part, the transmission line will follow an existing corridor to the nearby Eastshore Substation.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Energy Commission staff considers the methods and/or thresholds for significance unchanged since the 2002 Commission Decision was released.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)

The BRMIMP needs to be in place prior to the beginning of any project related surface disturbance and throughout construction to ensure that the project owner has the informational details necessary to comply with biological resources conditions of certification and applicable laws, ordinances, regulations, and standards. This is accomplished through the selection of a competent Designated Biologist who will coordinate with the project owner during construction. For the proposed amendment, specific items related to Biological Resources conditions of certification are modified or deleted to be consistent with the changes that will result from adoption of the proposed amendment.

Special-Status Species

Based on the results of 2006 field surveys conducted by the project owner (RCEC 2006), and a site visit by Energy Commission staff, new potential construction related impacts on biological resources are not expected to occur. Any construction related

impacts not addressed when the original project was certified will be minimal and where they develop, can be dealt with effectively through guidance measures provided in the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). This includes the unlikely event of encountering special-status species on the project site and ancillary facilities.

Wetlands and Habitat Compensation

Although Energy Commission staff agrees with the project owner's conclusion that the project site would not cause a direct loss of wetlands (RCEC 2006), thereby eliminating the requirement for a Wetlands Mitigation Plan originally required in Biological Resources Condition of Certification **BIO-15**, there is a vernal pool on the Eastshore Substation site that must be protected when the new transmission line is brought into the substation. Because the project owner has conducted recent field surveys, identified this sensitive resource, and the transmission line alignment generally avoids the vernal pool (RCEC 2007), Energy Commission staff believes it can be protected by implementation of relatively simple impact avoidance measures that would be described in the project BRMIMP.

The new project site does not represent sensitive species habitat, and therefore the project owner would not be required to get a Biological Opinion from the U. S. Fish and Wildlife Service and would not have to provide any habitat compensation. Biological Resources Conditions of Certification **BIO-6** (Biological Opinion) and **BIO-10** (Habitat Compensation) are no longer necessary.

Predator Perching

The new project does not include the original project's elaborate visual screening that would have given raptors new perching opportunities, thus increasing potential predation on sensitive species. (RCEC 2006) Mitigation previously required in Biological Resources Condition of Certification **BIO-14** for this potential impact is no longer necessary.

Construction Noise

The project owner suggests that the increased distance from the most biologically sensitive area to the south and west (the wetlands) of the original project site, in conjunction with warehouses between the new project site and the sensitive species habitat, would reduce the potential for construction noise impacts to sensitive species. These loud construction noises would emanate from pile driving and steam blow activities during construction. Energy Commission staff agrees that the increased distance between the sensitive species habitat and the new project site would diminish the noise levels, but the arrangement of the warehouses that could act as a buffer are actually not well suited to accomplish this buffering effect. The existing buildings are long, narrow, and oriented in a north-south direction with a sizable gap between them (see Figure 2.1-1 Project Location) (RCEC 2006). This gap could serve to funnel the noise to the sensitive area without achieving the fully anticipated decrease in noise levels. The construction noise mitigation plan requirement adopted in the original Commission Decision (CEC 2002) should be retained. This plan must be incorporated into the BRMIMP and implemented to provide the required lessening of the noise impacts to nearby sensitive species.

Operation Impacts and Mitigation

Biological Resources Mitigation Implementation and Monitoring Plan

This plan needs to be created by the project owner and in place during project operation to ensure that the project owner has the informational details necessary to comply with Biological Resources conditions of certification and applicable laws, ordinances, regulations, and standards. This is accomplished through the services of a competent Designated Biologist, approved by the Energy Commission Compliance Project Manager (CPM), who would coordinate with the project Construction/Operation Manager (see Biological Resources Condition of Certification **BIO-3**) during project operation. For the proposed amendment, specific items related to Biological Resources conditions of certification are modified or deleted to be consistent with the changes that would result from adoption of the proposed amendment.

Operational Noise

The operational noise issue is addressed in the Commission Decision on the original project and would remain unchanged for the new project location.

Bird Electrocution or Collisions with Transmission Lines

The operation issue related to bird electrocutions and collisions with transmission lines is addressed in the Commission Decision for the original project and remain unchanged for the new project location.

Stormwater Runoff

This operational issue was addressed in the Commission Decision on the original project and primarily dealt with potential negative effects on nearby sensitive species habitats and wetlands. The storm water management plan developed for compliance with Soil and Water Resources Condition of Certification **SOIL & WATER-3**, and proposed for this amendment, should be incorporated into the BRMIMP in case unforeseen circumstances potentially affecting sensitive biological resources, related to storm water run-off, arise in the future.

San Francisco Bay Water Quality

Because the project owner now proposes to use a zero liquid discharge process, there would be no impacts from process effluent discharges. Biological Resources Condition of Certification **BIO-8** in the Commission Decision required the project owner obtain a Section 401 Clean Water Act certification from the San Francisco Bay Regional Water Quality Control Board. Because of this project change, this certification would not be necessary.

Cumulative Impacts and Mitigation

Cumulative loss of wetland habitat, identified in the original project Commission Decision, would now not occur because of the proposed project changes. This issue pertaining to biological resources is no longer a concern, and Energy Commission staff has no changes to the cumulative impacts discussion that was contained in the 2002 Commission Decision.

RESPONSE TO AGENCY COMMENTS

Staff consulted the California Department of Fish and Game regarding whether the new project should retain the bird flight diverter requirement specified in the original Commission Decision. J. Krause (2007) recommended that the new project continue to be required to install bird flight diverters on the new transmission line overhead ground wire since the project is still in the region of the bay shoreline. Large flocks of shore birds are still found in the area, and the transmission line overhead ground wire may pose a collision threat to the local birds. The Energy Commission staff agrees with this recommendation and includes Biological Resources Condition of Certification **BIO-9** (original **BIO-13**) requiring that verification be provided to demonstrate that the bird flight diverters are installed on the new transmission line overhead ground wire prior to energizing the transmission line.

CONCLUSIONS

The project changes as proposed in the Petition to Amend would conform to applicable LORS and would not have a significant affect on sensitive species or their habitat near the project and ancillary facilities, if the proposed Biological Resources conditions of certification below are adopted. Due to the project changes, staff has eliminated six conditions of certification originally contained in the Commission Decision and has made significant changes to two additional conditions.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The following Biological Resources conditions of certification are the original conditions of certification contained in the Commission Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout is used to indicate deleted language and underline for new language.

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: 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 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 Energy Commission's Final Decision;
2. ~~A copy of the final, approved Perch Deterrent and Management 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 permits and state SFRWQCB 401 certifications, should these become necessary throughout the life of the project;
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~~ any State or USFWS Biological Opinion, and incorporation of all terms and conditions into the final BRMIMP, should a biological opinion become necessary any time throughout the life of the project;
16. A discussion of bird flight diverters and how they will be installed, replaced and maintained during the life of the project; and
- ~~17. Written verification that the required habitat compensation has been purchased 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 the project owner is sufficiently large to fund, for the life of the project, a predator 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 for stormwater discharges.~~

~~**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 developed for compliance with Soil and Water Resources Conditions of Certification shall be incorporated into the Biological Resources Mitigation Implementation and Monitoring 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;~~
- ~~5. Implement the terms of the Agreement between EBRPD and the Russell City Energy Center LLC, to the extent such terms are consistent with the terms and conditions of this decision; and~~
- ~~6. Record, with the deed to the 26.19 acres of habitat compensation, an appropriate instrument containing such covenants as will benefit EBRPD and restrict use of the land as an enhanced wetland consistent with the terms and conditions of this decision. Such restriction shall be for the duration of the enhancement and monitoring activities specified in Section 1.2 of the Agreement between EBRPD and the Russell City Energy Center LLC.~~

Verification:

- ~~1. No less than 30 days prior to any site mobilization activities, the project owner shall provide written verification to the CPM that the required habitat compensation has been purchased and the restricting covenants recorded.~~
- ~~2. No more than 90 days after completion of the enhancement actions specified in Section 1.2 of the Agreement between the Russell City Energy Center LLC and the EBRPD, and their approval by the regulatory agencies, the project owner must provide written verification to the CPM that the Applicant has provided to the EBRPD a fee simple deed to the 26.19 acre parcel.~~
- ~~3. No less than 30 days prior to the start of construction of permanent structures, the project owner shall provide written verification to the CPM that the Applicant has paid to the EBRPD the first payment of \$300,000. Thereafter, as each subsequent payment is made to the EBRPD in accordance with the terms of the Agreement between RCEC and EBRPD, the project owner shall provide written verification to the CPM within 30 days after each payment is made.~~
- ~~4. BIO-10 is independent of, and is not intended to change, the contractual rights and obligations of the Agreement between RCEC and EBRPD.~~

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 Energy Commission CPM in consultation with the USFWS, CDFG, and 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 Energy Commission 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. ~~GEC~~ Energy Commission staff, in consultation with the USFWS and CDFG, 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 Energy Commission 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. If needed, identify all measures to be implemented in the adaptive management plan, 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 Energy Commission 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 Energy Commission 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.~~

REFERENCES

CEC (California Energy Commission). 2002. Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

Krause, J. 2006. California Department of Fish and Game. E-mail Correspondence with Marc Sasaki. Eden Landing Ecological Preserve. January 23, 2007.

RCEC (Russell City Energy Company, LLC). 2006. Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

RCEC (Russell City Energy Company, LLC). 2007. Russell City Energy Company, LLC, Response to Data Requests 1-52, submitted to the California Energy Commission on January 17, 2007. Data Response 17-20.

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin J. Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff concludes that the proposed Amendment to the Russell City Energy Center (RCEC) project does not significantly change the analysis conducted for the original construction project in the area of hazardous materials management but does change the analysis of the operations phase in the area of hazardous materials management. Staff therefore proposes the amendment of one Condition of Certification and the acceptance of three others.

INTRODUCTION

This analysis focused only on changes to the original RCEC project that may affect hazardous materials management. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) The changes evaluated in this assessment include the relocation of the project site, the change of cooling technology to a Zero Liquid Discharge (ZLD) system, the addition of a Title 22 recycling water facility, the removal of the Advanced Water Treatment (AWT) facility, the relocation of the aqueous ammonia tank, and the new natural gas pipeline route. The original analysis for hazardous materials management can be found in the Final Staff Assessment (FSA) dated June 2002 (CEC 2002a).

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

There are no new LORS affecting this project in the area of hazardous materials management.

SETTING

The RCEC Amendment proposes to relocate the project site about 1,300 feet north and west, as well as rearrange the site plan and change portions of the transmission line and gas pipeline routes. Please refer to the Project Description section for more details.

The locations of sensitive receptors and residences relative to the project site have changed slightly as a result of the new location. The nearest residence is now 0.96 miles from the proposed site (as opposed to 0.82 miles previously) and other receptors are located within plus or minus 500 feet of the distances quoted in the original AFC. The amendment states that there are no sensitive receptors immediately adjacent to the project site (**RCEC Amendment** Section 3.6.1 and Figure 3.1D-1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Please refer to the FSA dated June 2002 (CEC 2002a).

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

Staff concludes that the proposed Amendment to the Russell City Energy Center (RCEC) project does not significantly change the analysis conducted for the original project in the area of hazardous materials management during the construction phase.

Operation Impacts and Mitigation

The use of a ZLD system, the removal of the AWT facility, and the addition of a Title 22 recycled water facility will result in changes to the RCEC chemical inventory. The project owner provided a revised list of chemicals and their storage locations (see Tables 3.5-1 through -3, **RCEC Amendment**). Staff finds that the changes to types and quantities of hazardous materials used and stored at the RCEC are minor and do not represent added risks beyond those evaluated in the original FSA.

The relocation and apparent redesign of the 29% aqueous ammonia tank and the ammonia facility as a whole will result in changes in impacts to off-site receptors in the event of an accidental spill of ammonia. The project owner prepared a new Off-Site Consequence Analysis (OCA) to evaluate the potential impacts of an ammonia spill with the new configuration. Staff reviewed the results of the OCA and found that the modeling was not consistent with previous modeling using the model SLAB. Staff cannot explain the discrepancies in the OCA modeling and thus conducted its own independent modeling using the U.S. EPA's SCREEN3 model. The results of this model show significant impacts off-site if an accidental release were to occur and fill the secondary containment area of 1463 square feet with aqueous ammonia. Staff notes that the original AFC described the secondary containment structure differently with a greatly reduced surface area of any spilled ammonia, approximately the size of the originally-proposed vent (one foot diameter; AFC page 8.5-13). Therefore, staff is proposing amending Condition of Certification **HAZ-4** requiring the project owner to design and build the secondary ammonia containment structure and the ammonia tanker transfer pad as per the original AFC (AFC page 8.5-17) or the equivalent. In this case, the secondary containment structure around the aqueous ammonia storage tank would be covered and a spill on the transfer pad would drain into the covered containment structure. Furthermore, staff proposes an additional condition **HAZ-11** to ensure that ammonia sensors are installed as per the original AFC (AFC page 8.5-17).

Site Security

This facility proposes to use hazardous materials that have been identified by the US EPA as materials where special site security measures should be developed and implemented to ensure that unauthorized access is prevented. The EPA published a Chemical Accident Prevention Alert regarding Site Security (EPA 2000), the U.S.

Department of Justice published a special report on Chemical Facility Vulnerability Assessment Methodology (US DOJ 2002), the North American Electric Reliability Council published Security Guidelines for the Electricity Sector in 2002 (NERC 2002), and the U.S. Department of Energy published a draft Vulnerability Assessment methodology for Electric Power Infrastructure in 2002 (DOE 2002). The energy generation sector is one of the 14 areas of Critical Infrastructure listed by the U.S. Department of Homeland Security (DHS). On December 28, 2006, the DHS published in the Federal Register (6 CFR Part 27) proposed regulations requiring that facilities that use or store certain hazardous materials conduct Vulnerability Assessments and implement certain specified security measures. To ensure that this facility complies with the soon-to-be enacted DHS regulations or that a shipment of hazardous material is not the target of unauthorized access, staff's newly proposed Conditions of Certification **HAZ-12 and 13** address both a Construction Security Plan and an Operations Security Plan. These plans would require the implementation of Site Security measures consistent with the above-referenced documents and Energy Commission guidelines.

The goal of these conditions of certification is to provide for the minimum level of security for power plants to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for this power plant is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. The results of the off-site consequence analysis prepared as part of the Risk Management Plan will be used, in part, to determine the severity of consequences of a catastrophic event. In order to determine the level of security, the Energy Commission staff will provide guidance in the form of a vulnerability assessment (VA) decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the NERC 2002 guidelines, and the U.S. Department of Energy VAM-CF model. Basic site security measures shall be required at all locations to protect the infrastructure and electrical power generation within the state.

These measures will include perimeter fencing and detectors, possibly guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of security breach. Site access for vendors shall be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only drivers properly licensed and trained. The project owner will be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B. The Compliance Project Manager (CPM) may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electric Reliability Council, after consultation with appropriate law enforcement agencies and the project owner.

CUMULATIVE IMPACTS AND MITIGATION

The project owner identified several facilities in the vicinity of the proposed RCEC site that use and store ammonia (see **RCEC Amendment** Table 3.5-5), which is the only chemical stored at RCEC with a potential to cause a cumulative impact. The Amendment states that due to the results of the OCA and the nearest facility being 0.47 miles away there is no significant potential for cumulative impacts from ammonia spills to occur. Staff agrees with this conclusion since it is highly unlikely that an ammonia spill would occur at two facilities at the same time, and even if such an event should occur, the mitigation measures proposed by staff and the distance between the RCEC and the nearest facility are sufficient to ensure that the plumes will not combine at an airborne concentration that would adversely impact public health. Therefore no cumulative impacts are expected from the use and storage of hazardous materials.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Mr. J.V. McCarthy, USAR retired, of 732 B. St., Hayward commented about the possibility that a large-scale flash fire could occur as a result of a major gas leak during a full power generation period. He expressed concern about major impacts from such a fire.

Response: Natural gas does pose a risk of fire and/or possible explosion if a release were to occur under certain specific conditions. However, it should be noted that, due to its tendency to disperse rapidly, natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas. While natural gas will be used in significant quantities at the RCEC, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices such as National Fire Protection Association (NFPA) code 85A. Adherence to this code, and other state and local fire codes, is required and will significantly reduce the likelihood of an explosion in gas-fired equipment. Automatic and manual shut-off valves will control the flow of natural gas. The safety management plan proposed by the project owner would address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error. Furthermore, the RCEC will rely on both onsite fire detection and suppression systems and local fire protection services. The onsite fire detection and suppression systems provide 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 provided by the Hayward Fire Department. Therefore, it is staff's position that the combination of engineering controls, fire detection and suppression systems, and off-site fire department response will reduce the risk of a major fire occurring or impacting the public to insignificance.

CONCLUSIONS

Staff concludes that the proposed RCEC amendment does not significantly change the analysis conducted for the original project in the area of hazardous materials management. Therefore, the mitigation measures proposed in the original FSA are

sufficient to reduce impacts from the use and storage of hazardous materials to insignificant.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout will be used to indicate deleted language and underline for new language.

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 (that 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 60 days prior to construction of hazardous materials storage facilities and control systems, 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 and built 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 125 percent of the storage volume or the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm, and shall be covered so that only drain holes or spaces or vents are open to the atmosphere. The aqueous ammonia tanker truck transfer pad shall be designed so that any spill drains to the covered secondary containment

structure. The final design drawings and specifications for the ammonia storage tank, the tanker truck transfer pad, and secondary containment basin shall be submitted to the CPM.

Verification: At least sixty (60) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank, the tanker truck transfer pad, and secondary containment basin(s) 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.

HAZ-11 Ammonia sensors shall be installed, operated, and maintained around the aqueous ammonia storage tank and tanker truck transfer pad. The number, specific locations, and specifications of the ammonia sensors shall be submitted to the CPM.

Verification: At least sixty (60) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings showing the number, location, and specifications of the ammonia sensors to the CPM for review and approval.

HAZ-12 At least 30 days prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction area;
2. Security guards;
3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-13 In order to determine the level of security appropriate for this power plant, the project owner shall prepare a Vulnerability Assessment and submit that assessment as part of the Operations Security Plan to the CPM for review and approval. The Vulnerability Assessment shall be prepared according to

guidelines issued by the North American Electrical Reliability Council (NERC 2002), the U.S. Department of Energy (DOE 2002), and the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002). Physical site security shall be consistent with the guidelines issued by the NERC (Version 1.0, June 14, 2002) and the DOE (2002) and will also be based, in part, on the use, storage, and quantity of hazardous materials present at the facility.

The project owner shall also prepare a site-specific Security Plan for the operational phase and shall be made available to the CPM for review and approval. The project owner shall implement site security measures addressing physical site security and hazardous materials storage. The level of security to be implemented will be determined by the results of the Vulnerability Assessment but in no case shall the level of security be less than that described as below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence or wall, at least 8 feet high;
2. Main entrance security gate, either hand operable or motorized;
3. Evacuation procedures;
4. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
6. Site personnel background checks, including employee and routine on-site contractors [Site personnel background checks are limited to ascertaining that the employee's claims of identity and employment history are accurate. All site personnel background checks shall be consistent with state and federal law regarding security and privacy.];
7. Site access controls for employees, contractors, vendors, and visitors;
8. Requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B;
9. Closed Circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) capable of viewing, at a minimum, the main entrance gate and the ammonia storage tank; and
10. Additional measures to ensure adequate perimeter security consisting of either:
Security guards present 24 hours per day, 7 days per week.

or

Power plant personnel on-site 24 hours per day, 7 days per week and all of the following:

1. The CCTV monitoring system required in number 9 above shall include cameras that are able to pan, tilt, and zoom (PTZ), have low-light capability, are recordable, and are able to view 100 percent of the perimeter fence, the ammonia storage tank, the outside entrance to the control room, and the front gate from a monitor in the power plant control room; and
2. Perimeter breach detectors or on-site motion detectors.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components (e.g., transformers, gas lines, compressors, etc.) depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the project owner.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site, the project owner shall notify the CPM that a site-specific Vulnerability Assessment and Operations Site Security Plan are available for review and approval.

REFERENCES

California Energy Commission (CEC), 2002a. Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

Environmental Protection Agency (EPA). 2000. Chemical Accident Prevention: Site Security. Environmental Protection Agency, Office of Solid Waste and Emergency Response. February 2000.

North American Electric Reliability Council (NAERC) 2002. Security Guidelines for the Electricity Sector, Version 1.0, June 14, 2002.

U.S. Department of Energy (US DOE) 2002. Draft Vulnerability Assessment Methodology, Electric Power Infrastructure. Office of Energy Assurance, September 30, 2002.

U.S. Department of Justice (US DOJ) 2002. Special Report: Chemical Facility Vulnerability Assessment Methodology. Office of Justice Programs, Washington, D.C. July 2002.

NOISE AND VIBRATION

Testimony of Steve Baker

SUMMARY OF CONCLUSIONS

The Noise and Vibration findings and conclusions incorporated in the Energy Commission's original decision (CEC 2002b) remain valid. The project, as amended, would likely comply with all applicable noise and vibration laws, ordinances, regulations and standards (LORS), and would likely cause no significant adverse noise or vibration impacts. To ensure that such is the case, staff recommends that the conditions of certification embodied in the original Commission Decision be retained, with minor revisions.

INTRODUCTION

This analysis addresses only those aspects of the RCEC project that would change as a result of the proposed amendment and that could affect the project's noise and vibration impacts and its compliance with noise and vibration LORS.

Changes due to the proposed amendment that could affect project noise and vibration include: relocating the project approximately 1,300 feet (1/4 mile) to the northwest of its permitted location; replacing the Advanced Water Treatment plant with a Zero Liquid Discharge facility; deleting the standby generator; installing a new natural gas pipeline in Depot Road; and, constructing a sound wall along the southern edge of the project site (RCEC 2006a). (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) — COMPLIANCE

Applicable LORS have not changed since the Energy Commission certified the project (CEC 2002b).

SETTING

Two aspects of the proposed amendment could act to change project noise and vibration impacts and compliance with LORS. One is changes to the project equipment list, specifically: the substitution of a Zero Liquid Discharge facility for the Advanced Water Treatment facility; the deletion of the standby generator; the installation of a new natural gas pipeline; and, the construction of a sound wall along the southern edge of the project site. The other is the relocation of the facility 1/4 mile to the northwest, which increases the distance between the facility and nearby sensitive noise receptors. The nearest residential receptor, a residence at 2627 Depot Road, now lies 0.96 miles distant, an increase from its prior distance of 0.82 miles (RCEC 2006a, Table 3.7-1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

As described in the Commission Decision (CEC 2002b, p. 195), staff examines the proposed project's likely noise and vibration impacts, during project construction and during plant operation, for compliance with applicable LORS, and evaluates these impacts for significance. This same method is employed in analyzing this amendment.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

The project owner explains that relocating the project and the construction parking area will still comply with all applicable noise and vibration LORS, and will cause no new significant impacts (RCEC 2006a, pp. 3-109, 3-110). The new natural gas supply pipeline will be buried in Depot Road. The surroundings of the new site are of the same character as the site certified by the Energy Commission, and likely noise receptors are similar in nature.

Staff agrees with this characterization. Since construction will be governed by the same conditions of certification incorporated in the Energy Commission's original decision, applicable LORS must still be complied with, and no new impacts are likely.

Operation Impacts and Mitigation

The project owner lists changes to the project design that could affect noise emissions (RCEC 2006a, pp. ES-1, 1-1, 2-2, 2-4). These include the substitution of a Zero Liquid Discharge facility for the Advanced Water Treatment facility and the deletion of the standby generator. The City of Hayward has submitted a letter (Hayward 2006) announcing that the project owner has committed to constructing a sound wall along the southern edge of the project site. To ensure that this wall is actually built, staff has proposed a modification to Condition of Certification **NOISE-6** below.

The change in water treatment methods will change the noise generation profile of the power plant. Deletion of the standby generator will decrease periodic noise emissions. The new sound wall will act to reduce noise propagation to the south, toward the Hayward Shoreline Interpretive Center. The project owner has modeled this altered noise regime and compared noise impacts from the amended project to ambient noise levels (RCEC 2006a, Table 3.7-2). This information is presented in **NOISE Table 2**:

NOISE Table 2
Comparison of Ambient Noise and Amended Project Noise Impacts

Monitoring Location	Average Nighttime L ₉₀ (dBA)	Amended Project Noise (dBA)	Difference (dBA)
Nearest residence – 2627 Depot Rd.	45.8	43	-2.8
Waterford Apartments	49.5	42	-7.5
Shoreline Interpretive Center	51.2	45	-6.2
Cogswell Marsh Bridge	44.5	44	-0.5

Source: RCEC 2006a, Table 3.7-2

In order to evaluate the significance of noise impacts, staff examines the increase in noise levels caused by the project at sensitive receptors. The increases at receptor locations are calculated and displayed in **NOISE Table 3**:

NOISE Table 3
Increase in Noise Levels Caused by Amended Project

Monitoring Location	Average Nighttime L ₉₀ (dBA)	Amended Project Noise (dBA)	Cumulative Level (dBA)	Increase due to Project (dBA)
Northern Project Boundary	N/A	75*	N/A	—
Nearest residence – 2627 Depot Rd.	45.8	43	47.8	+2
Waterford Apartments	49.5	42	50.5	+1
Shoreline Interpretive Center	51.2	45	52.2	+1
Cogswell Marsh Bridge	44.5	44	47.5	+3

*RCEC 2006a, Figure 3.7-1

The primary LORS applicable to project operation is the City of Hayward General Plan Noise Element (see above), which limits noise at project boundaries to between 75 dBA and 80 dBA. As seen in **NOISE Table 3** and in the Petition for Amendment (RCEC 2006a, Fig. 3.7-1), project boundary noise levels are not expected to exceed 75 dBA. This constitutes compliance with this LORS.

As explained in the Commission Decision (CEC 2002, p. 197), increases in noise levels of 5 dBA or less, are ordinarily considered insignificant impacts. As shown in **NOISE Table 3** above, predicted increases in noise level due to the project at sensitive receptors range from 1 dBA to 3 dBA. This would constitute an insignificant impact.

The project owner notes (RCEC 2006a, p. 3-113) that Condition of Certification **NOISE-6** required measurement of project noise emissions at the five measurement sites employed in the original Application for Certification. With the relocation of the project, Measurement Site 1 is no longer appropriate. In its place, the project owner requests that this site be changed to a location along the amended project's eastern boundary, the side of the project site that faces the majority of potential noise receptors. Staff

agrees with this change, and proposes this modification in Condition of Certification **NOISE-6** below.

CUMULATIVE IMPACTS AND MITIGATION

Staff knows of no new nearby projects, subsequent to the original Commission Decision, that could combine with the amended project to produce cumulative noise or vibration impacts.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

The only comment received regarding noise is a letter from the City of Hayward (Hayward 2006) that explains how the amended project will comply with all applicable local LORS, and reveals that the project owner has committed to construct a sound wall along the southern edge of the project site. Staff has incorporated this information into the above analysis.

CONCLUSIONS

The Noise and Vibration findings and conclusions incorporated in the Energy Commission's original decision remain valid, with the minor change being that the nearest residential receptors now lie further from the project site (CEC 2002b, p. 203 Finding No. 2). Specifically, the residence at 2627 Depot Road now lies one mile distant. The project, as amended, would likely comply with all applicable noise and vibration LORS, and would likely cause no significant adverse noise or vibration impacts. To ensure that such is the case, staff recommends that the conditions of certification embodied in the original Commission Decision be retained, with minor revisions to Condition of Certification **NOISE-6** as discussed above.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Commission Decision, with the exception that Condition of Certification **NOISE-6** has been modified as a result of the project owner's request, as part of its Petition to Amend submitted to the Energy Commission on November 17, 2006, and as discussed above. Strikeout has been used to indicate deleted language, and underline to indicate new language.

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.

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. Included shall be a sound wall along the southern edge of the project site.

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.

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 the eastern boundary of the project site, and 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 the eastern boundary of the project site or at monitoring sites 4, 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.

REFERENCES

CEC (California Energy Commission) 2002b — Commission Decision for the Russell City Energy Center AFC, Alameda County, published on September 11, 2002.

Hayward 2006 — City of Hayward letter from Jesús Armas, City Manager, to B. B. Blevins, California Energy Commission, December 5, 2006.

RCEC (Russell City Energy Company, LLC) 2006a — Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

SOCIOECONOMIC RESOURCES

Testimony of Amanda Stennick

SUMMARY OF CONCLUSIONS

The modification of the Russell City Energy Center (RCEC) will have a minor effect on socioeconomics. Tax rates and capital costs for the project have increased, which, in turn, will increase the project's economic benefits to the local economy. The number of construction jobs has increased slightly but will not cause a significant net change to the local economy. The number of operation jobs will remain the same and will not cause a significant net change to the local economy.

The proposed project site is currently located in both unincorporated Alameda County and the City of Hayward. The Alameda County Local Annexation Formation Commission (LAFCO) approved the annexation of the Alameda County portion of the project site to the City of Hayward in February 2007. LAFCO will complete the annexation process by April 2007. The annexation will not adversely impact the distribution of the project's economic benefits within the local economy. Please refer to the **Land Use** section of the Staff Assessment (SA) Part 2, which will be released in May or June 2007, for a discussion of the annexation.

INTRODUCTION

This analysis covers only those aspects of the RCEC that have changed as a result of the proposed amendment and that affect staff's testimony for **SOCIOECONOMIC RESOURCES** as contained in the Final Staff Assessment (FSA) dated June 2002 (www.energy.ca.gov/sitingcases/russellcity/documents/2002-06-10_FSA.PDF). The project changes that have been analyzed are the number of project construction workers and the impacts to the local economy resulting from the increased capital cost of the project and the change in the Alameda County sales tax rate.

LAWS, ORDINANCES, REGULATION, AND STANDARDS - COMPLIANCE

There are no changes to LORS as a result of the RCEC modification. Please refer to the 2002 FSA for the list of **SOCIOECONOMIC LORS**.

SETTING

The new RCEC project site is located about 1,300 feet north of the previously proposed site. As stated above, upon annexation, the new site will be located entirely within the City of Hayward. **SOCIOECONOMIC FIGURES 1** and **2** for the proposed RCEC location are the same as described in the FSA and Commission Decision for the original project location.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

There are no changes to the method and/or threshold for determining significance for **SOCIOECONOMIC RESOURCES**.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

SOCIOECONOMICS TABLE 1 is an update of the 2002 labor force for the project. The 2002 analysis showed the construction workforce would average 277 workers during the construction period and would peak at 485 workers. The RCEC amendment estimates that the construction workforce would average 324 workers during the 24-month construction period and would peak at 650 workers in month 14 (estimated at May 2009). Based on the updated labor force in the Oakland-Fremont-Hayward Metropolitan Division and the construction worker requirements in the RCEC amendment, the average number of workers required for project construction represents less than one percent of the total number of workers in **SOCIOECONOMICS TABLE 1**. Based on the small increase in the average number of workers by month, staff does not expect any adverse impacts to the area's schools, housing, law enforcement, emergency services, hospitals, or utilities. No new mitigation is proposed.

SOCIOECONOMICS TABLE 1
Available Labor by Skill in Oakland-Fremont-Hayward Metropolitan Division

Occupational Title	2008 Annual Averages
Cement Masons/Concrete Finishers	1,240
Carpenters	12,290
Helpers, Construction Trades	2,320
Electricians	5,220
Laborers	13,430
Operating Engineers	3,510
Engineering Technicians	4,620
Painters	4,030
Plumbers/Pipefitters/Steamfitters	3,290
Sheetmetal Workers	1,560
Administrative Service Managers	2,400
Truck and Tractor Operators	5,190
Welders/Cutters/Solderers/Brazers	3,510
Mechanical Engineers	1,850
Electrical Engineers	1,650
Plant and System Operators	3,850
Total:	69,960

The RCEC amendment estimates the total construction cost of the project to be \$600 million, of which \$74.7 million will be paid out as wages and salaries, including benefits. Local products subject to county taxes will be purchased during the construction process. The RCEC amendment states that about \$12 million of total local product purchases would be taxed during project construction. The sales tax rate in Alameda County is 8.75 percent (as of July 1, 2006). The total tax revenue from the sale of local products during the two-year construction period would be about \$1,050,000. The 2001 Application for Certification estimated that sales tax revenue to the City and County would range from \$412,500 to \$825,000, based on \$5 to \$10 million of products purchased locally during construction.

Operation Impacts and Mitigation

Property taxes are levied and collected annually by Alameda County at a rate of 1.0294 percent of the property value. The RCEC amendment estimates the total construction cost of the project to be \$600 million. Based on this figure, total property tax is estimated at \$6.17 million annually, which is an increase of the total property tax range of \$3.47 million to \$4.63 million in the 2002 analysis.

The number of operation jobs will remain the same and will not cause a significant net change to the local economy.

SOCIOECONOMICS TABLE 2 shows the change in labor, revenues, and taxes from the 2001 AFC to the 2006 RCEC Amendment. Total regional income is calculated through the use of an economic multiplier on project costs and wages. The 2001 AFC stated that based on the construction costs of \$300 to \$400 million, the benefits to the region would total an estimated \$92 million. The 2007 amendment states that the project construction costs would now total an estimated \$600 million. The 2007 estimated total regional income was not calculated by the applicant and therefore, will not be available for this analysis (Davy 2007). Staff will assume, based on the \$600 million construction costs that the 2007 total regional income would exceed that of 2001.

SOCIOECONOMICS TABLE 2
Noted Project Changes: 2001 to 2006

	2001 AFC	2006 Amendment
Project Labor Peak	485 persons	650 persons
Project Labor Monthly Average	277 persons	324 persons
Project Costs	\$300-\$400 million	\$600 million
Wages and Salaries	\$58.2 million	\$74.7 million
Sales Tax During Construction	\$412,000-\$825,000	\$1,050,000
Annual Property Tax	\$3.47-\$4.63 million	\$6.17 million
Total Regional Income	\$92 million	Not available
Source: RCEC 2001 AFC and 2006 RCEC Amendment		

CUMULATIVE IMPACTS AND MITIGATION

The 2002 FSA stated that the proposed project would not result in any significant adverse socioeconomic impacts on population, housing and public services and would

not contribute to cumulative socioeconomic impacts in the South Bay or San Francisco Bay Area.

In addition to the RCEC, other projects planned in Alameda County are:

- the Eastshore Energy Center (EEC) (06-AFC-6), a 115.5 MW peaking plant; and
- the Interstate 880/State Route 92 Interchange Reconstruction Project in the City of Hayward.

Project construction for the EEC is expected to occur from March 2008 through September 2009 (a total of 18 months) and is expected to peak at 235 workers in February 2009 (month 11). Project construction for the RCEC is expected to occur from March 2008 through March 2010 (a total of 24 months) and is expected to peak at 650 workers in May 2009 (month 14). The potential cumulative impact would be the overlap of construction periods for both projects, or the entire 18-month EEC construction period. However, the combined peak workforce of both project totals 885 workers, which represents about 1.2 percent of the 2008 average annual Oakland-Fremont-Hayward MSA workforce. Therefore, staff does not expect the RCEC by itself or cumulatively with the EEC to contribute to a significant cumulative socioeconomic impact.

Project construction for the Interstate 880/State Route 92 Interchange is expected to start in June 2007 and end in June 2011. The construction labor force for the road construction project would not be similar to that of a construction labor force for a power plant. Many labor crafts such as plant operation engineers, electricians, plumbers, pipefitters, and steamfitters would be in demand for power plant construction and not for road construction. While there is a potential for overlap in the construction categories of truck and tractor operators, laborers, construction equipment operators, and cement masons and concrete finishers, the 2008 average annual Oakland-Fremont-Hayward MSA workforce of 69,960 is large enough to accommodate all three projects.

Because of the large labor force in the Oakland-Fremont-Hayward MSA, the amended project by itself or when combined with other projects would not contribute to significant adverse cumulative socioeconomic impacts. No additional mitigation is necessary.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

There are no agency and public comments in the area of **SOCIOECONOMIC RESOURCES** resulting from the proposed amendment.

CONCLUSIONS

The proposed amendment would not induce significant adverse impacts to the area's schools, housing, law enforcement, emergency services, hospitals, or utilities. Project benefits include increases in the local economy from wages, taxes, and local spending. No new mitigation is proposed.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

No new conditions of certification have been proposed as a result of project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Please note that since the June 2002 FSA, staff no longer proposes the socioeconomic condition that requires the project owner and its contractors and subcontractors to recruit employees and procure materials and supplies locally. Staff has found that this condition creates additional work for staff and the applicant and yields very little useful information. Therefore, staff has omitted it from the 2007 amendment socioeconomic analysis.

~~**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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- Lepore, Larry, 2001. Telephone communication between Larry Lepore, Director of Facilities and Planning, Hayward Unified School District and Dan Gorfain, Aspen Environmental Group, July 18, 2001.
- U.S. Census 1990. U.S. Census Data, 1990 Census. Population, Income and Poverty Status 1990.
- U.S. Census 2000. U.S. Census Data, 2000 Census. Profile of General Demographic Characteristics: 2000.

SOIL AND WATER RESOURCES

Testimony of Richard Latteri

SUMMARY OF CONCLUSIONS

There would be no unmitigated impacts to soil and water resources because of the proposed project changes in Amendment No. 1 for the Russell City Energy Center (RCEC). Staff have not identified any unmitigated significant impacts to soil and water resources provided all proposed amendments to the conditions of certification are implemented. Staff recommends changes to Conditions of Certification **SOIL & WATER 1,2,3, 4, & 6**.

INTRODUCTION

On November 17, 2006, the Russell City Energy Company, LLC (project owner) filed a petition with the California Energy Commission to modify the RCEC project. The petition contains several modifications, the most notable being the relocation of the project facilities approximately 1,300 feet northwest of the original location in the City of Hayward (City). All proposed modifications are described in the **Project Description** Section of this document.

This analysis addresses project changes that would potentially impact soil and water resources through the construction and operation of the RCEC at its new location. Only those aspects of the RCEC project that have changed because of the proposed amendment and that affect staff's testimony for Soil and Water Resources, as contained in the Commission Decision (Decision) dated September 11, 2002 (CEC 2002b), are examined. Identification and removal of contaminated soil is more fully discussed in the **Waste Management** Section to be included in Part 2 of this SA.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

SOIL AND WATER Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Federal LORS	
Clean Water Act (33 U.S.C. Section 1257 et seq.)	The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality, that includes regulation of stormwater discharges during construction and operation of a facility.
Resource Conservation and Recovery Act	The Resource Conservation and Recovery Act (RCRA) of 1976 (40 CFR Part 260 et seq.) seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
State LORS	
Water Code Section 13260	Requires filing with the appropriate Regional Board (RB) a report of waste discharge for the protection to waters of the state, unless the requirement is waived pursuant to Water Code section 13269.

Water Code Section 13551	Requires the water resources of the state be put to beneficial use to the fullest extent they are capable, and the waste or unreasonable use or unreasonable method of use be prevented.
Local LORS	
Hayward Municipal Code, Chapter 11, Article 2	Hayward Municipal Water System Ordinance that establishes requirements for permit application and approval for obtaining potable water from the City.
Hayward Municipal Code, Chapter 11, Article 3	Hayward Sanitary Sewer System Ordinance that establishes requirements for permit application and approval for obtaining Sanitary Sewer service from the City.
Hayward Municipal Code, Chapter 11, Article 5	Hayward Stormwater Management and Urban Runoff Control Ordinance that establishes consistency with the requirements of the Federal Clean Water Act and National Pollutant Discharge Elimination System (NPDES) Permit CAS0029831.
State Policies and Guidance	
California Constitution, Article X, Section 2	This section requires the water resources of the State be put to beneficial use to the fullest extent possible and states the waste, unreasonable use, or unreasonable method of use of water is prohibited.
California Code of Regulations, Title 17	Title 17, Division 1, Chapter 5, addresses the requirements for backflow prevention and cross connections of potable and non-potable water lines.
California Code of Regulations, Title 22	Title 22, Division 4, Chapter 15, requires the California Department of Health Services (DHS) review and approve the wastewater treatment systems to ensure they meet tertiary treatment standards.
California Code of Regulations, Title 23	Title 23, Division 3, Chapter 15, requires the RB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
CWC Section 13523	Requires that a RB shall prescribe water reuse requirements for water, that is to be used or proposed to be used as recycled water after consultation with and upon receipt of recommendations from the DHS and if it determines such action to be necessary to protect the public health, safety, or welfare.
CWC Section 13550	Requires the use of recycled water for industrial purposes subject to recycled water being available and upon a number of criteria including: provisions that the quality and quantity of the recycled water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use will not impact downstream users or biological resources.
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq)	In the 2003 IEPR, consistent with State Water Resources Control Board Policy 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound.”

SETTING

The regional setting for the new project has not changed; the new project site is approximately 1,300-feet northwest of the original project site. The new location lies approximately 1.0-mile east of South San Francisco Bay (Bay), which is closer to the Bay’s eastern shoreline than the original site.

PROJECT, SITE, AND VICINITY DESCRIPTION

The project owner proposes to construct a 600 megawatt energy generating facility in the east industrial area of the City of Hayward, Alameda County, California. The site is situated adjacent to and south of Depot Road in the east Hayward industrial area. Cabot Road has its southern terminus at Depot Road across from the northeast corner of the site. Enterprise Avenue lies to the south of the site boundary. The topography of the site

is essentially flat, with a mean elevation of approximately 10 feet above mean sea level (MSL). Elevations to the east tend to increase gradually toward the east bay foothills. The site and immediate surrounding area to the north, east, and south are primarily commercial and industrial in nature. West of the site lies a large area of tidal flats and vacant property (RC 2006a, Section 3.1.1.10)

The existing uses of the proposed RCEC site include a 5.4-acre City parcel that is currently used for sewage sludge drying. Directly north of the City's parcel, an 8.6-acre parcel is currently occupied by a pallet storage and distribution business, a metals fabrication business, lumber storage yard, and a miscellaneous storage facility. Another parcel directly east of the 8.6-acre parcel is currently used as an automobile salvage and dismantling yard consisting of approximately 3.0-acres. Of the 18.8-acres of RCEC property, 16.5-acres will be fenced that include the East Bay Dischargers Authority (EBDA) easement. The construction parking and laydown areas are located east and south of the power plant site and are presently used as an auto storage yard and light industry facility respectively (RC 2006a, Section 3.3.1.1 and CH2MHill 2007a, Data Response 42-1).

Project Description Figure 2.1-1 shows the project site, construction parking and laydown areas, and linear facilities. The linear facilities consist of the electric transmission line, natural gas supply line, potable water supply line, and sanitary sewer line. The natural gas pipeline route and a small portion of the transmission line route would be re-located. The natural gas pipeline will connect to the existing Pacific Gas and Electric Company's (PG&E) natural gas pipeline located along the Union Pacific Railroad easement to the east of the project. The pipeline would run entirely under Depot Road for a distance of approximately 3,800-feet. Both the potable water supply line and sanitary sewer line will run south from the RCEC site and connect to the existing City pipelines located under Enterprise Avenue.

There are two alternatives for the new 230 kV transmission line that would run in the existing 115 kV Grant-RCEC transmission corridor between the RCEC Project and the PG&E RCEC substation. The two alternative routes are shown on **Project Description Figure 2.1-1**.

Water Supply and Wastewater Treatment

The City's Water Pollution Control Facility (WPCF) will continue to supply secondary effluent to the RCEC project. In the Amendment, the originally approved Advanced Water Treatment (AWT) facility has been replaced with a Title 22 Recycled Water Facility (RWF) to be owned and operated by the project owner. The project owner also proposes a Zero Liquid Discharge (ZLD) system for the new project that will eliminate the discharge of process wastewater from the RCEC (RC 2006a, Section 2.1.5).

Because the AWT plant has been removed from the proposed project, the City will not own or operate any portion of the project. Instead of an AWT, the plant will include on-site Title 22 treatment equipment. The WPCF will provide secondary-treated effluent to the project, and the on-site Title 22 treatment system will be designed to produce tertiary treated recycled water suitable for unrestricted use.

Cooling tower blowdown will be treated in the ZLD system. The inclusion of the ZLD system, the addition of the Title 22 RWF, and removal of the AWT plant will involve some redesign of the water treatment systems and modifications to the site arrangement. The quantities of water used will remain nearly the same as under the original design. The quantities of wastewater produced will decrease significantly with the addition of the ZLD system (RC 2006a, Section 2.1.6).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The new RCEC project was analyzed to determine if it complies with LORS and meets the standards found in the California Environmental Quality Act (CEQA) Guidelines. The federal and state and local LORS presented in **SOIL AND WATER Table 1** were used to determine the threshold of significance for this analysis.

The following LORS and state policies were used to determine the threshold of significance. This threshold is based on the ability of the project to be built and operated without violating erosion, sedimentation, flood, surface or groundwater quality, water use (supply) or wastewater discharge standards.

- The Resource Conservation Recovery Act of 1976 seeks to prevent surface and groundwater contamination.
- Water Code Section 13551 requires the water resources of the state be put to beneficial use to the fullest extent they are capable, and the waste or unreasonable use or unreasonable method of use be prevented.
- City of Hayward Municipal Code Section 11, Article 2 requires the applicant to obtain a Permit for Water Service Connection.
- City of Hayward Municipal Code Section 11, Article 3 regulates the quantity and quality of wastewater discharge to the sanitary sewer system.
- City of Hayward Municipal Code Section 11, Article 5 authorizes the City to implement its municipal stormwater program for urban runoff.
- Title 17 of the California Code of Regulations addresses the requirements for backflow prevention and cross connections of potable and non-potable waterlines.
- Title 22 of the California Code of Regulations requires DHS review and approval of wastewater treatment systems to ensure they meet tertiary treatment standards for industrial processes and landscape irrigation.
- Title 23, Division 3, Chapter 15 of the California Code of Regulations requires the RB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.

For those impacts that exceed the published standards, or do not conform to the established practices, mitigation will be proposed by staff to reduce or eliminate the impact. Such a determination will by necessity rely on science, technology, expert

opinion, and best professional judgment to determine what the level of change to the baseline or pre-existing conditions should be.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The direct and indirect impacts and mitigation discussion presented below is divided into a discussion of impacts related to construction and a discussion of impacts related to operation. For each potential impact discussed, the applicant's proposed mitigation is presented and staff's determination of the adequacy of the proposed mitigation is discussed. If necessary, staff will propose additional mitigation measures and refer to specific conditions of certification related to a potential impact and the required mitigation measures.

Construction Impacts and Mitigation

As with the previous project, construction of the new RCEC will include soil excavation, grading, building construction, and installation of utility connections. Potential impacts to soil and water resources can be caused by increased erosion or the release of hazardous materials during construction.

Water and Wind Erosion

The topography of the RCEC site, laydown area, and linear features is nearly level with a mean elevation of approximately 10-feet above MSL. The project site is approximately 18.8-acres and is currently occupied by a number of industrial businesses and sludge stockpiles. All existing buildings, foundations, and paved surfaces will be removed as part of the RCEC construction. The construction parking and laydown areas will be located on several parcels covering a combined area of 8.7-acres (RC 2006a, Section 2.4.4 and CH2MHill 2007a, Data Response 42-1).

Construction of the RCEC will require grading and earthwork to bring the base elevation to above the 100-year floodplain elevation. Active soil grading will occur over a 12 to 18-month period within the project site. No significant grading would occur on the construction parking and laydown areas, but the project owner proposes to add additional gravel as necessary to stabilize the areas. During construction, stormwater will be diverted to catch basins for settling and eventual discharge to the Alameda County Flood Control and Water Conservation District's (ACFCWCD) stormwater channel (RC 2006a, Section 2.4.4 and CH2MHill 2007a, Data Response 42-1).

The draft Drainage, Erosion and Sedimentation Control Plan (DESCP) submitted by the project owner provides erosion control Best Management Practices (BMPs) for addressing soil erosion and treatment control methods for trapping eroded sediments during construction. The proposed BMPs include mulching, physical stabilization, dust suppression, storm drain inlet protection, earth dikes and drainage swales (CH2MHill 2007a, Data Response 41). However, given the existing on-site soil contamination from PCBs and petroleum hydrocarbons, potential impacts related to soil loss could be exacerbated and off-site transport of eroded sediments could lead to significant water quality impacts to the Bay.

In February 2003, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) approved a new Alameda County Municipal Stormwater Permit (No. CAS0029831), that requires more stringent BMPs for new development. The project owner will comply with the requirements of the new municipal stormwater permit and those provisions as defined in the permit (Provision C.3) that set performance standards for new development and redevelopment. The requirements of the municipal permit will be added to Condition of Certification **SOIL & WATER 2** as part of Construction Storm Water Pollution Prevention Plan (SWPPP) (CH2MHill 2007a, Data Response 41). With the implementation of appropriate BMPs that are a requirement of the municipal stormwater permit (CAS0029831), and the DESCP, the project owner expects to keep soil loss due to water and wind erosion to a negligible amount that would not constitute a significant impact.

Staff agrees the proper selection and implementation of BMPs can reduce the impact to soil resources from water and wind erosion to a level that is less than significant. Conformance with the procedures in an approved DESCP will limit erosion and migration of any remaining contaminants that may be disturbed by construction, from entering the ACFCWCD stormwater channel or waters of the state. Staff have reviewed the draft DESCP and the requirements of the Alameda Countywide Municipal Stormwater Permit. Those documents require the applicant to test and monitor soil and runoff from the RCEC site. Conditions of Certification **SOIL & WATER 1 & 2** will be amended to include Provision C.3 of NPDES Permit CAS0029831 and the specific requirements for a DESCP. Because adequate steps will be taken as part of the design and implementation of the Construction SWPPP and DESCP as required in Conditions of Certification **SOIL & WATER 1 & 2**, staff believe soil loss and erosion from construction of the RCEC will not cause a significant impact.

Surface and Groundwater Quality

The elevation of the RCEC site ranges from 3-feet above MSL to around 11-feet above MSL. The project owner proposes to bring in engineered fill to bring the base elevation of the RCEC site to approximately 10-feet above MSL. Groundwater was encountered at depths of 5-feet below ground surface (bgs) to 15-feet bgs. The project owner would not use groundwater during construction, and based on the amount of fill required to bring the site to approximately 10-feet above MSL, the estimated depth to groundwater would be approximately 12-feet bgs (CH2Mhill 2007a, Data Response 28).

If groundwater is encountered during construction, the applicant proposes dewatering and hazardous waste management BMPs. Any groundwater encountered would be sampled prior to off-site disposal (CH2Mhill 2007a, Data Response 42-1). Staff agree the likelihood of encountering groundwater during construction is remote, and based on the applicants proposed dewatering BMPs in their draft Construction SWPPP and DESCP, no impacts to surface and groundwater resources will occur during construction of the RCEC project.

Soil and Groundwater Contamination

The new RCEC site and laydown parcels are located in a densely developed industrial area that is zoned for industrial and heavy industrial uses. The draft Phase II Environmental Site Assessments (ESA) prepared by LFR, Inc. dated November 20,

2006, indicates that polychlorinated biphenyls (PCBs) and petroleum hydrocarbons were detected in several locations on the RCEC site. The Phase II ESA also indicates that soil excavation and off-site disposal is appropriate in some areas, but does not provide specific dimensions or the specific locations (LFR 2006e).

To ensure the site is adequately characterized and remediated for known soil contaminants, condition of certification **SOIL & WATER 5** has been approved in the initial Decision that requires the project owner to prepare a site assessment map to further delineate contaminated areas. The **Waste Management** Section of this analysis will provide additional condition(s) of certification that will identify the appropriate oversight agency to review and approve a Cleanup Plan or Soil Management Plan in conjunction with City of Hayward Fire Department. Through implementation of an appropriate site cleanup plan combined with erosion control measures, the possibility of contaminants leaving the site will be minimized.

Operation Impacts and Mitigation

Operation of RCEC at the proposed new site could lead to potential impacts to soil, stormwater runoff, water supply, and wastewater treatment. Soils may be impacted through erosion or the release of hazardous materials used in the operation of RCEC. Stormwater runoff from the RCEC site could result in potential impacts if there is an increase to flowrate or volume discharge from the site to the ACFCWCD drainage channel. Water quality could be impacted by the discharge of eroded sediments from the RCEC site; discharge of hazardous materials released during operation; or migration of existing hazardous materials present in the subsurface soil.

Soil Erosion

The proposed 18.8-acre RCEC site is presently used for a variety of industrial activities, including auto wrecking, pallet storage, sludge drying, and metal finishing. After the power plant site has been filled, graded, compacted, covered with concrete or gravel, and the drainage system installed, there will be minimal potential for natural erosion. Routine vehicular access to the site during operation will be limited to existing roads. Standard operating activities will not involve disruption of soil (RC 2006a, Section 3.10.1.5).

Soil impacts and the potential for soil erosion will not be significant. An Industrial SWPPP for plant operations will be developed to set performance standards and monitoring provisions will be required for effective stormwater pollution identification and mitigation. Condition of Certification **SOIL & WATER 3** will require the submittal and implementation of a site-specific Industrial SWPPP and is amended to include the provisions of the City's Municipal Code, Chapter 11, Article 5 and the municipal NPDES Permit No. CAS0029831. With the implementation of the Industrial SWPPP that is to be in compliance with the City's Municipal Code, Chapter 11, Article 5 and Provision C.3 of the municipal permit, no significant impacts to soil resources from plant operation are expected.

Surface and Groundwater Quality

Development of roads, buildings, and other impermeable surfaces as part of the RCEC project will not substantially increase the runoff rate or volume from the RCEC site. It is

not anticipated there will be increased stormwater runoff from the site or the potential for increased sediment and contaminants conveyed off-site.

Stormwater

Due to the new project location, the on-site stormwater retention pond is no longer necessary to protect endangered wildlife and has been removed from the project. On-site stormwater runoff will be curbed to contain and route runoff. Rainfall within areas of the site where contact with equipment or in maintenance areas will be collected, combined with other site drainage, and sent through an oil-water separator. The oil-water separator will remove floating oil, grease, and other hydrocarbons. The clean water from the separator will be sent to the sanitary sewer. Stormwater runoff from non-contained areas of the RCEC will be diverted to a series of catch basins and discharged to the ACFCWCD stormwater channel running along the western boundary of the project (RC 2006a, Section 3.10.1.3).

The applicant proposes to submit and implement an Industrial SWPPP for the protection of surface and groundwater and to meet the requirements of the City's Municipal NPDES Permit (CAS0029831). Condition of Certification **SOIL & WATER 3** will be amended to include the requirements of the municipal permit as well as the City's Municipal Code, Chapter 11, Articles 3 and 5 for the discharge to the City's sanitary sewer system and for urban stormwater control. The proposed RCEC will prevent increased stormwater runoff through the development of structural BMPs in compliance with Condition of Certification **SOIL & WATER 3**. Staff believe, with the submittal and implementation of the site-specific requirements in Condition of Certification **SOIL & WATER 3** including compliance with all municipal codes and discharge permits, impacts to surface water from stormwater runoff during RCEC operation will be less than significant.

Groundwater

Operation activities at the RCEC would have minimal potential to impact groundwater resources in the project area. The project owner would not use groundwater during operation, and based on the amount of fill required to bring the site to approximately 10-feet above MSL, the estimated depth to groundwater would be approximately 12-feet bgs (CH2MHill 2007a, Data Response 28). During plant operation, the RCEC would not use or impact groundwater resources.

No underground chemical storage tanks are proposed at the project site. No release of contaminated stormwater from the plant site is expected; and therefore, no contact with groundwater will occur. No significant impacts to groundwater resources will result from plant operation if a site specific Industrial SWPPP that includes the City's Municipal Code, Chapter 11, Articles 3 and 5 for the discharge to the City's sanitary sewer system and for urban stormwater control are implemented per the amended requirements of Condition of Certification **SOIL & WATER 3**.

Tsunami and Seiche

Tsunamis are waves typically generated offshore or within large bodies of water during a subaqueous fault rupture or a subaqueous landslide event. Seiches are waves generated within a large body of water caused by the horizontal movement of an

earthquake. Due to the proximity of the project site to the Bay, there is a potential for the RCEC site to be impacted by a tsunami or seiche resulting from the occurrence of a major earthquake along the San Andreas or Hayward faults.

According to the City's 2002 General Plan, a tsunami with a wave height of 20 feet at the Golden Gate bridge is likely to occur approximately once every 200 years, and would result in a run-up of less than 10 feet above sea level if it reached the City. Since the curbs and floors of the RCEC will be at an elevation of approximately 11-feet above MSL, and the site is located approximately 1.0-mile from the shore of the Bay, the likelihood the site will be impacted by a tsunami or seiche is low (COH 2002a).

Flooding Potential

The RCEC project site is located approximately 1,300 feet north of the previous location, and the majority of the project site is now located within the revised Federal Emergency Management Agency (FEMA) 100-year floodplain. The project site will be filled and compacted, as necessary, to ensure the minimal risk of flooding and will be in compliance with FEMA policies and the City ordinance that require the plant to be above the 100-year flood level (RC 2006a, Section 3.10.1.2). Condition of Certification **SOIL & WATER 7** requires the project owner to provide evidence of its request for a flood zone map revision with the City and to provide evidence of FEMA's issuance of a conditional letter of map revision (CLOMR).

Water Supply

Water required for domestic uses and fire fighting would continue to be provided by the City. The quantities of water used would remain nearly the same as under the original design. The City receives its potable water from the City and County of San Francisco's regional water system operated by the San Francisco Public Utility Commission, and delivers only potable water to its customers. Potable water demand is estimated to total an average of 3 gpm or approximately 4 acre-feet per year (AFY) (RC 2006a, Section 2.1.5).

Condition of Certification **SOIL & WATER 4** presently allows the use of potable water as a backup cooling source for industrial purposes. The use of potable water for industrial purposes is in conflict with Section 13551 of the State Water Code. Because the RCEC is adjacent to WPCF and disruption of service is expected to be very infrequent and last only a matter of days (CH2MHill 2007a, Data Response 41), staff are proposing to cap the amount of potable water use for industrial purpose to 20 days (480 hours) in any one calendar year in the amended Condition of Certification **SOIL & WATER 4**.

Recycled Water Supply and Treatment

The RCEC will use recycled water for steam production and power plant cooling in a hybrid, wet/dry plume-abated, mechanical-draft cooling tower. The City's WPCF will provide secondary effluent to the RCEC. The secondary effluent constituents from the WPCF will remain the same as those described in the original Decision. The on-site Title 22 RWF will treat the secondary effluent to Title 22 disinfected tertiary standards that can be used for unrestricted use (except drinking). The project owner proposes to use tertiary treated recycled water for all plant processes.

The secondary effluent will be delivered to the site via a new 50-foot pipeline originating from the southeast corner of the project to the adjacent 48-inch secondary effluent pipeline that runs along the southern edge of the RCEC. Operation of the RCEC is projected to require up to 2,793 gallons per minute (gpm) of secondary effluent from the City, or approximately 3,600 AFY. The influent pump station will pump secondary effluent from the existing 48-inch pipeline to the clarification process units. From those units, flow through the remainder of the treatment process will be by gravity. Effluent from the clarifiers will continue on to disk filters that will provide the filtration required to meet Title 22 tertiary treatment standards. The filtered water will continue on to the chlorine contact basins. The basins will be designed to provide the disinfection contact time required for unrestricted use of tertiary treated recycled water (RC 2006a. Section 2.1.6.1).

The production and use of recycled water is regulated under state law. Section 13523 of the California Water Code requires the SFBRWQCB to prescribe water reuse requirements for water that is to be used as recycled water after consultation with the DHS for protection of the public health and safety. In addition, California Code of Regulations Title 17 address the health and safety requirements of backflow prevention and cross connections of potable and non-potable water lines; where as, Title 22 requires DHS to approve recycled water systems through the review and approval of a DHS mandate engineering report. To meet federal and state laws, an amended Condition of Certification **SOIL & WATER 4** is proposed that will include the requirements for an engineering report and any other DHS or SFBRWQCB permits. Additional language has been added to **SOIL & WATER 4** requiring tertiary treated recycled water be used for all non-potable uses including landscape irrigation..

Compliance with the amended Condition of Certification **SOIL & WATER 4** will ensure that the City and the project owner comply with state law as it applies to the production and use of recycled water. Through compliance with state law, there will be no impacts from the production and use of recycled water. In addition, Condition of Certification **SOIL & WATER 6** has been amended to delete any reference to the AWT and language added for the submittal of long-term contracts from the City for delivery of potable water and secondary effluent to the RCEC.

Wastewater Disposal

As originally approved in the Commission Decision, the RCEC would use an AWT plant both to treat the secondary effluent and the wastewater leaving the site. With this amendment, the AWT plant has been removed from the project and has been replaced with an on-site Title 22 RWF. In addition, a ZLD system has been added to the project. With the removal of the AWT plant and the addition of the ZLD system, wastewater from the cooling tower will no longer be treated on-site and returned to the WPCF for disposal through the EBDA outfall pipeline to the Bay. Instead, cooling tower blowdown will be sent to the ZLD system.

The ZLD system will evaporate the water and the solids will be compacted into a salt cake to be disposed of off-site. The use of the ZLD will decrease the blowdown wastewater stream from approximately 33 gpm under average conditions (46 gpm under peak conditions) to virtually zero. In addition, copper and nickel from the

secondary effluent will not be discharged to the EBDA pipeline, thus avoiding any potential violations of the EBDA permit. A small amount of sludge from the clarifier at the Title 22 RWF will be sent back to the WPCF for treatment via the sanitary sewer line. Filter backwash water will be recycled to the influent pump station. With the ZLD system, process wastewater will be recycled and reused to the extent practicable and the majority of the metals present in the secondary effluent will not be released off-site as wastewater effluent (RC 2006a, Section 2.1.6.3).

Sanitary Wastewater

Sanitary wastewater generated from sinks, toilets and other sanitary facilities at the RCEC will discharge to the City's sanitary sewer system. The discharge of any wastewater to the City's sewer system would be subject to the requirements of the City's Municipal Code Section 11, Article 3 that regulates the quantity and quality of discharges to the sewer system. Condition of Certification **SOIL & WATER 3** will be amended to include the requirements of the City's Municipal Code, Chapter 11, Articles 3 for the discharge to the City's sanitary sewer system. Condition of certification **SOIL & WATER 3** requires the project owner to provide the Compliance Project Manager (CPM) a copy of the discharge permit that complies with the City's Municipal Code Section 11, Article 3. Compliance with **SOIL & WATER 3** will ensure there are no significant impacts or conveyance of prohibited pollutants to the City's sanitary sewer system.

CUMULATIVE IMPACTS AND MITIGATION

Soil Erosion

During the construction phase of the RCEC, two other major construction projects in the vicinity of the RCEC may be undergoing construction. The two projects are the proposed Eastshore power plant and SR-92 improvements. Construction activities related to the RCEC project may cause a temporary increase in cumulative wind and water erosion when combined with the soil disturbing activities of the above mentioned projects until the RCEC site is stabilized. Implementation of the DESCP and SWPPP for Construction Activities will minimize the potential for adding to the cumulative impacts due to soil erosion.

Surface Hydrology

Disturbed soils could increase the sediment and pollution loading to the ACFCWCD drainage channel and the Bay when combined with the potential pollution loading caused by the construction of the Eastshore power plant and the SR-92 improvements. However no cumulative impacts are expected if BMPs are employed in accordance with the DESCP to minimize erosion during and after construction. Both stormwater and non-stormwater discharge from dewatering activities will be monitored and disposed of properly.

Development of the RCEC site would redirect surface drainage to a catch basin for discharge to the ACFCWCD drainage channel. The implementation of the DESCP and the Construction and Industrial SWPPPs and compliance with state and local LORS will

mitigate potential cumulative surface hydrology impacts from the RCEC project to less than significant levels.

Water Supply

Staff have not identified any development projects that would diminish the supply of potable water or secondary recycled water from the City's municipal water system or WPCF; and therefore, no cumulative impacts to the City's potable water or secondary recycled water supply will occur.

Groundwater

The project will not use groundwater. There is a slight possibility groundwater may be encountered during construction and require dewatering. The water encountered would be shallow groundwater and could be contaminated. Groundwater requiring dewatering during construction will be managed in accordance with the DESCOP and SWPPPs for Construction and Industrial Activities. The entire RCEC site would be covered with impervious materials, gravel, or landscaping after construction. Chemical storage areas would have secondary containment. All surface flow from the project site would first flow to the catch basins before discharge to ACFCWCD drainage channel. There will be no cumulative impacts from RCEC construction or operation to groundwater resources.

Wastewater

The wastewater streams from the RCEC project include plant drainage from equipment areas, contact stormwater, clarifier sludge, and sanitary wastewater. The combined wastewater flow will be monitored to assure compliance with the City's municipal codes and discharge limits for use of the sanitary sewer system. Compliance with Chapter 11, Article 2 of the City's Municipal Code will ensure no cumulative impacts to the sanitary sewer system will occur.

RESPONSE TO AGENCY COMMENTS

Staff received comments from the SFBRWQCB by letter dated December 20, 2006 (CRWQB 2006a). SFBRWQCB staff reviewed the Amendment Petition and requested the project owner comply with the requirements of the Municipal Stormwater NPDES Permit CAS0029831 for stormwater discharge from new development or significant redevelopment. Staff have included the municipal permit in both amended Conditions of Certification **SOIL & WATER 2 & 3** as a requirement of the Construction and Industrial SWPPPs.

COMPLIANCE WITH LORS

A number of new LORS were presented in **SOIL AND WATER Table1**. The RCEC, as proposed in Amendment No. 1, will comply with the following LORS if all amended conditions of certification are implemented.

- The Resource Conservation Recovery Act of 1976 by the proper handling and discharge of wastewater.

- The California Safe Drinking Water and Toxic Enforcement Act by establishing secondary containment in chemical storage areas and testing of all wastewater discharges.
- The California Constitution, Article X, Section 2 by using recycled water for plant process water.
- City of Hayward Municipal Code, Chapter 11, Article 2 for the permitted use and hookup to the City's potable water system.
- City of Hayward Municipal Code, Chapter 11, Article 3 for the permitted use and hookup to the City's sanitary sewer system.
- City of Hayward Municipal Code, Chapter 11, Article 5 for the discharge of construction and operation stormwater in compliance with City's municipal NPDES permit (CAS0029831).
- Title 17 of the California Code of Regulations, by ensuring the DHS confirms the requirements for backflow prevention and cross connections of potable and non-potable water lines.
- Title 22 of the California Code of Regulations, by ensuring the DHS reviews the recycled water treatment systems to ensure they meet tertiary treatment standards for protection of public health.
- Title 23 of the California Code of Regulations requiring the SFBRWQCB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable. And to ensure the wastewater treatment plant operator or site supervisor is qualified for the effective operation of wastewater and water recycling treatment plants.
- The Integrated Energy Policy Report (CEC 2003) by using reclaimed water for plant process water.

CONCLUSIONS

Staff have not identified any unmitigated significant impacts to soil and water resources provided all proposed and amended Conditions of Certification are met. The RCEC project would comply with all applicable soil and water resources LORS. Potentially significant impacts would be mitigated through the preparation and implementation of various construction and operating plans, reports and permits which, if not implemented or complied with, could result in, soil erosion, contamination to surface and ground water, or violations of wastewater treatment and discharge requirements.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The following soil and water resources Conditions of Certification are the original conditions of certification contained in the Decision or modifications to existing conditions that staff have identified as a result of federal and state law or project changes proposed by the project owner submitted in Amendment No. 1 for the RCEC. Strikeout is used to indicate deleted language and underline for new language.

SOIL & WATER 1 Prior to beginning any site mobilization activities, the project owner shall obtain CPM approval for a Grading site-specific Drainage, Erosion and Sedimentation Control Plan (DESCP) that address all project elements. The Grading and Erosion Plan DESCP shall include and be consistent with the standards normally required under the City of Hayward's Grading Permit. The DESCPC shall be consistent with the grading and drainage plan as required by condition of certification CIVIL-1 and may incorporate by reference any Storm Water Pollution Prevention Plan (SWPPP) developed in conjunction with any state or municipal NPDES 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 The DESCPC shall contain the following elements:

- A. Vicinity Map** – A map(s) at a minimum scale 1"=100' shall be provided indicating the location of all project elements with depictions of all significant geographic features including swales, storm drains, and sensitive areas.
- B. Site Delineation** – All areas subject to soil disturbance for the RCEC project (project site, lay down area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction area and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
- C. Watercourses and Critical Areas** – The DESCPC shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the RCEC project construction, lay down, and landscape areas and all transmission and pipeline construction corridors.
- D. Drainage Map** – The DESCPC shall provide a topographic site map(s) at a minimum scale 1"=100' showing all existing, interim and proposed drainage systems and drainage area boundaries. On the map, spot elevations and contours shall be extended off-site for a minimum distance of 100 feet.
- E. Drainage Narrative** – The DESCPC shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size(s) in acres used in the calculation of drainage control measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the RCEC project construction and laydown areas.
- F. Clearing and Grading Plans** – The DESCPC shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The

locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

G. Clearing and Grading Narrative – The DESC shall include a table with the quantities of material excavated or filled for the site and all project elements of the RCEC project (project site, lay down areas, transmission corridors, and pipeline corridors) to include those materials removed from the site due to demolition, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported. The table shall distinguish whether such excavations or fill is temporary or permanent and the amount of material to be imported or exported.

H. Best Management Practices – The DESC shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, excavation and construction, and final grading/stabilization). Treatment control BMPs used during construction should enable testing of stormwater runoff prior to discharge to the stormwater system. BMPs shall include measures designed to prevent wind and water erosion in areas with existing soil contamination. Treatment control BMPs used during construction should enable testing of groundwater and stormwater. If runoff has unacceptable levels of contaminants including petroleum hydrocarbons or PCBs, the runoff must be treated to acceptable levels prior to discharge.

I. Best Management Practices Narrative – The DESC shall show the location (as identified in H above), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading/demolition, during project excavation and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control BMPs, or a statement provided when such information will be available.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESC to the City of Hayward (City) for review and comment. No later than 60 days prior to start of site mobilization, the project owner shall submit the DESC and the City's comments to the CPM for review and approval. The CPM shall consider comments received from the City on the DESC before issuing approval. The DESC shall be consistent with the grading and drainage plan as required by condition of certification **CIVIL-1** and relevant portions of the DESC shall clearly show approval by the Chief Building Official. The DESC shall be consistent with Stormwater Pollution Prevention Plan (SWPPP) developed in conjunction with the City's municipal NPDES Permit No. CAS0029831 for Construction Activity. The project owner shall provide in the monthly compliance report a narrative on the effectiveness of the drainage, erosion and sediment control measures, the results of monitoring and maintenance activities, and the dates of any dewatering activities. 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 comply with the requirements of the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Storm Water Associated with Construction Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the RCEC site, laydown area, and all linear facilities. The Construction SWPPP shall abide by the City of Hayward's (City) Stormwater Management and Urban Runoff Control Ordinances (Chapter 11, Article 5) set forth in NPDES Permit No. CAS0029831. 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. The project owner shall submit to the CPM a copy of the Construction SWPPP that includes all requirements of Hayward Municipal Code Chapter 11, Article 5 for Stormwater Management and Urban Runoff Control prior to site mobilization and retain a copy on-site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the City about the City's Stormwater Management and Urban Runoff Control Ordinances and the General NPDES permit for the Discharge of Stormwater Associated with Construction Activities within 10 days of its receipt or submittal. This information shall include a copy of the Notice of Intent for the project.

SOIL & WATER 3: The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the RCEC. The Industrial SWPPP shall abide by the City of Hayward's Stormwater Management and Urban Runoff Control Ordinances (Chapter 11, Article 5) set forth in NPDES Permit No. CA0029831. 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.~~ The project owner shall submit to the CPM a copy of the Industrial SWPPP that includes all requirements of Hayward Municipal Code Chapter 11, Article 5 for Stormwater Management and Urban Runoff Control prior to commercial operation and retain a copy on-site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the City about the City's Stormwater Management and Urban Runoff Control Ordinances and the General NPDES permit for the Discharge of Stormwater Associated with Industrial Activity within 10 days of its receipt or submittal. The Industrial SWPPP shall include a copy of the Notice of Intent for the project.

SOIL & WATER 4: ~~The project owner shall use tertiary-treated water supplied from the City of Hayward's Advanced Water Treatment (AWT) Plant on-site Title 22 facility 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 on-site Title 22 facility AWT Plant supply, but not to exceed 45 days (1080 hours) 20 days (480 hours) in any one calendar year. Fresh Potable water used for domestic purposes shall be metered separately from fresh potable 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. However, potable water may be used for cooling and process purpose in excess of 45 days per calendar year if an unavoidable interruption of the AWT supply is due to an Act of God, a natural disaster, an unforeseen emergency or other unforeseen circumstance outside the control of the project owner. If one of the aforementioned unavoidable interruptions should occur, the CPM, project owner and the City of Hayward shall confer and determine how best to restore the AWT supply as soon as practicable.~~

The RCEC will use tertiary recycled water for all non-potable uses including landscape irrigation. The RCEC will comply with requirements of Title 22 and Title 17 California Code of Regulations. Prior to the use of recycled water for any purpose, the owner shall submit a Title 22 Engineering Report that has been approved by the Department of Health Services (DHS) and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB).

The project owner shall prepare and submit to the CPM an annual summary that 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 revenue meters.

The project owner will not use more than 4 AFY of potable water in a calendar year for sanitary and domestic purposes.

Verification: Prior to the use of recycled water for any purpose the project owner shall submit to the CPM the water supply and distribution system design and Engineering Report for the Production, Distribution and Use of Recycled Water approved by DHS and the SFRWQCB demonstrating compliance with this condition. The recycled water supply and distribution system design shall be included in the final design drawings submitted to the CBO as required in Condition of Certification **Civil 1**.

The Engineering Report for the Production, Distribution and Use of Recycled Water shall be prepared in accordance with the Title 22 and Title 17 California Code of Regulations, the Health and Safety Code, and the Water Code. The project owner shall comply with any reporting and inspection requirements set forth by DHS and the SFRWQCB to fulfill statutory requirements. The project owner shall submit copies to the CPM of all correspondence between themselves and DHS or the SFRWQCB within 10 days of receipt or submittal.

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 site mobilization, the project owner shall provide the CPM with two (2) copies of an executed and final Water Supply Agreement in accordance with the City of Hayward (City) Municipal Code Section 11, Article 2 and any other service agreements with the City for obtaining potable water for the construction and operation of the RCEC project. The project owner shall also provide the CPM with two (2) copies of an executed and final Recycled Water Supply Agreement that includes the Master Discharge Permit from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) for the production and delivery of recycled water by the City's Water Pollution Control Facility (WPCF).

The agreements shall detail any requirements, conditions, or restrictions on the project owner for the use of potable water and or secondary treated recycled water. The project owner shall not connect to the City's potable water or secondary effluent pipelines without final approval from the City. The project owner shall provide the CPM copies of the final approval from the City and all monitoring or other reports required by the agreements. The project owner shall notify the CPM of any violations of the agreements terms and conditions, the actions taken or planned to bring the project back into compliance with the agreements and the date compliance was reestablished. 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 two (2) copies of the executed Water Supply Agreement and any other service agreements between the project owner and the City for obtaining potable water for construction and operation of the Eastshore project in accordance with City Municipal Code Section 11, Article 2. 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.

Prior to commercial operation, the project owner shall submit to the CPM two (2) copies of an executed and final Recycled Water Supply Agreement between the project owner and the City for the supply of secondary effluent. The Recycled Water Supply Agreement will include the Master Discharge Permit from the SFBRWQCB for the production and delivery of recycled water by the WPCF.

During operations, the project owner shall submit any water quality monitoring reports for potable or recycled water use required by the City to the CPM in the annual compliance report. The project owner shall submit any notice of violations from the City to the CPM within ten (10) days of receipt and fully explain the corrective actions taken in the annual compliance report. The project owner shall submit any notice of violation of the agreement's terms and conditions to the CPM within ten (10) days of receipt and

shall fully explain the corrective actions taken in the next monthly compliance report or annual compliance report, as appropriate.

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. The project owner shall also obtain a Section 401 Clean Water Act certification from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) or provide a letter from the SFBRWQCB stating that 401 certification is not required.

REFERENCES

CEC 2002b –California Energy Commission/Commissioners (tn:26635).
Commission Decision for Russell City - POS.

CH2MHILL 2007a – CH2MHILL/D.M. Davy (tn: 38948). Applicant's Responses to Staff Data Requests 1-52. Cover letter docketed, transmittal letter, and attached POS. 01/17/2007. Rec'd 01/17/2007.

COH 2002a. City of Hayward *General Plan, Conservation and Environmental Protection Element*. March 2002.

CRWQB 2006a – CRWQB/B. Wines (tn: 38743). Comments on the Request for Agency Participation in the Review of the Russell City Energy Company, LLC, Amendment Petition – SCH No. 200509293. 12/20/2006. Rec'd 12/21/2006.

LFR 2006e – LFR/Levine – Fricke (tn: 38490). Revised Draft Phase II Environmental Site Assessments Parcel #001-09301-01. 11/08/2006. Rec'd 11/17/2006.

RC 2006a – Russell City/M. Hartfield (tn: 38410). Petition for Amendment NO. 1, Russell City Energy Center. 11/17/2006. Rec'd 11/17/2006.

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

Staff finds that the design and operational plan for the proposed modification to the transmission line for the Russell City Energy center (RCEC) would be in keeping with standard Pacific Gas and Electric's (PG&E's) practices reflecting compliance with applicable laws, ordinances, regulations and standards (LORS). The proposed modification is the relocation of RCEC away from the presently approved site, which would necessitate relocating the route of a relatively small (500-foot to 1,000-foot) portion of RCEC's already approved overhead 230-kilovolt (Kv) transmission line that would connect it to PG&E's Eastshore Substation. The section to be modified is the part connecting RCEC to the section of the approved line that begins from the corridor of the existing PG&E 115-kV Grant-Eastshore line. Since the same safety and effective field management measures would be applied to the entire RCEC line as proposed for both the original and new locations, staff regards the proposed modification plan as adequate to ensure compliance with applicable LORS. With the five proposed conditions of certification, any line-related safety and nuisance impacts would be less than significant.

INTRODUCTION

The purpose of this analysis is to assess the proposed project line modification for compliance with the laws, ordinances, regulations and standards (LORS), which staff found adequate (for the original project location) for ensuring public health and safety. Staff's analysis focuses on the following issues as related primarily to the physical presence of the line, or secondarily to the physical interactions of its 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.

The following are the federal, state, and local laws and policies that apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

**TRANSMISSION LINE SAFETY AND NUISANCE (TLSN) TABLE 1
Laws, Ordinances, Regulations and Standards (LORS)**

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR), "Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	Not to exceed applicable local noise ordinances – (no design-specific federal or state regulations for noise from transmission lines).
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) Section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

Applicable LORS	Description
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC "Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California"	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

SETTING

As noted in the **Project Description** section, the present proposal is to relocate the previously approved RCEC to a site approximately 1,300 feet (0.25 miles) northwest of the original site. The only change to the project's already approved overhead 230-kV line would be relocation of a relatively small (500-foot to 1,000-foot) segment running from the project's switchyard to the corridor of PG&E's 115-kV (at Enterprise Avenue) from where both lines would run parallel to each other (in the existing PG&E line corridor that the 115-kV line now occupies by itself) to their respective termination points within PG&E's Eastshore Substation to the east. This new 230-kV, RCEC-to- PG&E's 115-kV line corridor segment would be erected on tubular steel poles as with the already permitted segment that begins at the noted connecting spot at Enterprise Avenue. The entire project line would be designed, built, operated, and maintained by

PG&E, meaning the applicable PG&E guidelines would be followed (RCEC 2006, p. 2-18).

As more fully discussed in the **Project Description** section, the project owner, Russell City Energy Center, LLC, (RCEC 2006, p. 2-13) proposes two alternative routes for this proposed RCEC-to-PG&E's 115-kV corridor segment. The final length of the entire RCEC line (as it extends to the Eastshore Substation) would depend on the route chosen. The new project site and the two alternative routes for the new line segment, would (as with the original location) still lie within an industrial corridor with relatively few residences the nearest of which would be 0.96 miles versus 0.82 miles for the previous site. (RCEC 2006a, p 3-105). This means that the residential field exposure at the root of the health concern of recent years would be relatively insignificant for the new line proposal. As with the already-permitted segment, the only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the immediate vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern.

PROJECT DESCRIPTION

The proposed line modification project would consist of the components listed below with the final length depending on which of the two alternative routes is chosen:

- An overhead, double-circuit 230-kV line extending from the project's 230-kV switchyard to the point of connection with the already-permitted Enterprise Avenue-to-the Eastshore Substation segment and,
- The project's on-site 230-kV switchyard.

As with the already-permitted segment, the proposed line's conductors would be standard PG&E, low-corona cables to be erected on tubular steel poles. The applied design and construction would be in keeping with PG&E guidelines necessary to ensure line safety and efficiency together with reliability, and maintainability.

As more fully discussed by the project owner (RCEC 2006a, p 2-13), the first alternative route would extend from the RCEC Switchyard east to the eastern edge of the project's property and then run northwards towards Depot Road from where it would turn left and run approximately 230 feet to the connection point within the corridor for the PG&E 115-kV line. If this route is chosen, the total line connection from the RCEC to Eastshore Substation would be 7,010 feet (1.33 miles).

The second alternative would extend from the RCEC Switchyard eastwards to the east edge of the RCEC property line and then run southwards to the property line from which it would turn east and run for 950 feet to connect with the noted permitted segment. The choice of this route would bring the total length of the RCEC-to-Eastshore Substation connection line to 6410 feet (1.21 miles). Staff does not see any significant differences between the routes with regard to the safety and field management issues of concern in this analysis.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The potential magnitude of the line impacts of concern in this staff analysis depends on compliance with the listed LORS whose related mitigation measures have been established as adequate to maintain such impacts below levels of potential significance. Thus, if staff determines that the project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

DIRECT IMPACTS AND MITIGATION

Aviation Safety

Any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace and the need to file a “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA as noted in the LORS section. 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.

As noted by the project owner (RCEC 2006a pp. 2-15 and 2-16), the nearest airport to the project is Hayward Executive Airport whose nearest runway is 8466 feet (1.60 miles) northeast of RCEC or related line. Although this distance is less than the FAA safe minimum of 10,000 feet, the north-to-northeast orientation of the runway would place RCEC and its related lines away from the area of potential collision hazard with utilizing aircraft. The maximum height of 115 feet for the line support structures in this situation would be well below the trigger height of 150 feet for FAA notification. At approximately 2.76 miles to the southeast, the St. Rose Hospital heliport is located too far for any of the RCEC line segments to pose an aviation hazard to utilized helicopters. Given these expected conditions, staff considers the proposed line structures as not posing an obstruction-related aviation hazard to area aircraft as defined using current FAA criteria. Therefore, no obstruction-related FAA “Notice of Construction or Alteration” would be required for the line.

Interference with Radio-Frequency Communication

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge, but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern

transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts is, therefore, minimized by reducing the line electric fields and locating the line away from inhabited areas.

The proposed line segment would be built and maintained in keeping with standard PG&E practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345-kV and above, and not the proposed 230-kV line. The proposed low-corona designs are used for all PG&E lines of similar voltage rating to reduce surface-field strengths and related potential for corona effects. Since these existing lines do not currently cause the corona-related complaints along their existing routes, staff does not expect any corona-related radio-frequency interference or related complaints in the general project area. However, staff recommends Condition of Certification **TLSN-2** to ensure mitigation as required by the FCC in the unlikely event of complaints.

Audible Noise

The noise-reducing measures for field strength reduction are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such noise is limited instead through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345-V or higher. It is, therefore, not generally expected at significant levels from lines of less than 345-kV such as the proposed line segment. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the low-corona designs are also aimed at minimizing field strengths, staff does not expect the proposed line segment to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed line and related facilities, please refer to staff's analysis in the **Noise And Vibration** section.

Fire Hazards

The fire hazards addressed through the related LORS in **TLSN Table 1** of this analysis are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between the line and nearby trees and other combustible objects.

Standard fire prevention and suppression measures for similar PG&E lines would be implemented for the proposed project line (RCEC 2006a, p. 2-18). The intended compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Condition of Certification **TLSN-4**, is recommended to ensure compliance with important aspects of the fire prevention measures.

Hazardous Shocks

Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. 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.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

The project owner's intention to implement the GO-95-related measures against direct contact with the energized line (RCEC 2006a, p. 2-18) would serve to minimize the risk of hazardous shocks. Staff's recommended Condition of Certification **TLSN-1** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). For the proposed project line, the project owner will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way.

The potential for nuisance shocks around the proposed line segment would be minimized through standard industry grounding practices (RCEC 2006a, p. 2-18). Staff recommends Condition of Certification **TLSN-5** to ensure such grounding.

Electric and Magnetic Field Exposure

The possibility of deleterious health effects from EMF exposure has increased public concern in recent years about living near high-voltage lines. Both electric and magnetic fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by the California Public Utilities Commission (CPUC), other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. Most regulatory agencies believe, as staff does, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

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

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

State

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

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

nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new or modified line in California is currently required by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed project line segment according to existing PG&E field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

The CPUC has finished revisiting the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The findings did not point to a need for significant changes to existing field management policies.

Industrial Standards

The present focus is on the magnetic field because only it can penetrate the soil, buildings and other materials to potentially produce the types of health impacts at the root of the health concern of recent years. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S. Department of Energy, 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term, while the exposure from power lines are lower level, but long-term. Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

As with similar PG&E lines, specific field strength-reducing measures would be incorporated into the design of the proposed line segment to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include the following:

1. Increasing the distance between the conductors and the ground;
2. Reducing the spacing between the conductors;
3. Minimizing the current in the line; and
4. Arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Since optimum field-reducing measures would be incorporated into the proposed line design, staff considers further mitigation to be unnecessary, but would seek to validate the applicant's assumed reduction efficiency from the field strength measurements recommended in Condition of Certification, **TLSN-3**.

CUMULATIVE IMPACTS AND MITIGATION

Since the proposed project transmission line segment and related switchyard would be designed by PG&E according to its field-reducing PG&E guidelines (as currently required by the CPUC for effective field management), staff expects the resulting fields to be of the same intensity as fields from PG&E lines of the same voltage and current-carrying capacity. Any contribution to cumulative area exposures should be at similar levels. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. The actual field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-3**.

COMPLIANCE WITH LORS

As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in this case is PG&E. Since the proposed project line segment and related switchyard would be designed according to the respective requirements of GO-95, GO-52, GO-131-D, and Title 8, Section 2700 et seq. of the California Code of Regulations, and operated and maintained by PG&E according to its guidelines on line safety and field strength management, staff considers the presented design and operational plan to be in compliance with the health and safety LORS of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed from results of the field strength measurements required in Condition of Certification **TLSN-3**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any public or agency comments.

CONCLUSIONS

Since the proposed line segment would not pose an aviation hazard to area airports or heliports, staff does not consider it necessary to recommend location changes on the basis of such a hazard.

The potential for nuisance shocks would be minimized by PG&E through its grounding and other field-reducing measures. These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise. The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of PUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards while the use of PG&E's low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed route.

Since electric or magnetic field health effects have neither been established nor ruled out for the proposed or already-permitted RCEC line segment and similar transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line's design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure of health concern in recent years would be insignificant for the proposed line given the general absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for PG&E lines of similar design and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

Since the proposed project line would be designed, built, owned, operated and maintained by PG&E to minimize the health, safety, and nuisance impacts of concern to staff, while located along a route without nearby residences, staff considers it as conforming to applicable LORS. With the five proposed conditions of certification, any of these impacts would be less than significant.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout will be used to indicate deleted language and underline for new language.

TLSN-1 The project owner shall construct the proposed transmission lines according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2. High Voltage Electrical Safety Orders, Sections 2700 through 2974 of the California Code of Regulations, and Southern California Edison's EMF-reduction guidelines.

Verification: At least thirty days before starting construction of the transmission line or related structures and facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards. The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to plant operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if

possible, to indicate concurrence with the corrective action or agreement with the justification for a lack of action.

Verification: 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 hire a qualified consultant to measure the strengths of the electric and magnetic fields from the proposed line segment before and after it is energized. The measurements shall be made according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures at the locations of maximum field strengths along the chosen route. These measurements shall be completed not later than six months after the start of operations.

Verification: The project owner shall file copies of the pre-and post-energization measurements and measurements with the CPM within 60 days after completion of the measurements.

TLSN-4 The project owner shall ensure that the rights-of-way of the proposed transmission line 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 regardless of ownership. In the event of a refusal by any property owner to permit such grounding, the project owner shall so notify the CPM. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this Condition.

REFERENCES

Electric Power Research Institute (EPRI) 1982. Transmission Line Reference Book: 345 kV and Above.

Russell City Energy Center (RCEC 2006a. Amendment I Submitted to the California Energy Commission on November 17, 2006.

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.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin J. Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff concludes that, for the most part, the proposed changes to the Russell City Energy Center (RCEC) project do not significantly change the analysis conducted for the original project in the area of worker safety and fire protection. However, recent staff assessments and changes in the conditions of certification require amending an existing condition and adding three new ones.

INTRODUCTION

This analysis focused only on changes to the original RCEC project that may affect worker safety and fire protection. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) The changes evaluated in this assessment include the relocation of the project site, the changes to cooling technology and water recycling systems, the relocation of a small portion of the transmission line, the new natural gas pipeline route, and the new laydown area. The original analysis for worker safety and fire protection issues can be found in the Final Staff Assessment (FSA) dated June 2002 (CEC 2002a).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) - COMPLIANCE

There are no new LORS affecting this project in the area of worker safety and fire protection.

SETTING

The RCEC Amendment proposes to relocate the project site about 1,300 feet north and west, as well as rearrange the site plan and change portions of the transmission line and gas pipeline routes. Please refer to the Project Description section for more details.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The method and thresholds for determining significance for worker safety and fire protection have not changed from those described in the 2002 FSA for the original RCEC project (CEC 2002a).

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

The project owner stated in the RCEC Amendment that all workers will undergo proper training according to applicable LORS and therefore there are no worker safety and fire protection impacts that are different than those analyzed previously for the original project (RCEC 2006a). Staff agrees that, for the most part, the project amendment does not add or change impacts to worker safety and fire protection during the construction phase beyond those assessed in the original FSA. However, since the time of certification, staff has amended, developed, and proposed conditions of certification to address the generic issues of worker safety during the construction phase.

Original Condition **WORKER SAFETY-2** is amended to remove the requirement that the California Occupational Safety and Health Administration (Cal-OSHA) Consultation Service review and comment on the required Safety and Health Programs. Cal-OSHA has notified staff that it no longer wishes to review those plans.

Also since the original date of certification, staff has found that protecting construction workers from injury and disease is among the greatest challenges in occupational safety and health and that the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large complex industrial type projects such as the construction of gas-fired power plants. To reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. This has been evident in the audits of power plants under construction recently conducted by the staff. The Federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors to improve their safety and health performance; to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between and struck-by hazards) which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections; to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal-OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal-OSHA regulations do, however, require that safety be provided by an employer and the term "Competent Person" is used in many OSHA and Cal-OSHA standards, documents, and directives. A "Competent Person" is usually defined by OSHA as an individual, who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, to meet the intent of the OSHA

standard to provide for a safe workplace during power plant construction, staff proposes new Condition of Certification **WORKER SAFETY-3** which would require the applicant/project owner to designate and provide for a power plant site Construction Safety Supervisor.

As discussed above, the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large complex industrial type projects such as the construction of gas-fired power plants. Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the recent past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits conducted in 2005 at several power plants under construction. The findings of the audit staff, include, but are not limited to, such safety oversights as:

- Lack of posted confined space warning placards/signs;
- Confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- Confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- Dangerous placement of hydraulic elevated platforms under each other;
- Inappropriate placement of fire extinguishers near hotwork;
- Dangerous placement of numerous power cords in standing water on the site thus increasing the risk of electrocution;
- Construction of an unsafe aqueous ammonia unloading pad; and
- Inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility but too close to the perimeter fence.
- Lack of adequate employee or contractor written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on- or off-site.

To reduce and/or eliminate these hazards, it is necessary to have a safety professional monitor on-site compliance with Cal-OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. These requirements are outlined in Condition of Certification **WORKER SAFETY-4**. A monitor, hired by the project owner yet reporting to the CBO and CPM, will serve as an “extra set of eyes” to ensure that safety procedures and practices are fully implemented at power plants certified by the Energy Commission.

During the audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged them in questions about the team’s findings and recommendations. These safety professionals recognized that safety requires

continuous vigilance and that the presence of an independent audit team provided a “fresh perspective” of the site.

Operation Impacts and Mitigation

The project owner stated in the RCEC Amendment that all workers will undergo proper training according to applicable LORS and therefore there are no worker safety and fire protection impacts that are different than those analyzed previously for the original project (RCEC 2006a). Staff for the most part agrees that the project amendment does not add or change impacts to worker safety and fire protection during the operations phase beyond those assessed in the original FSA. However, since the time of certification, staff has developed and proposed a worker safety condition of certification to address a generic worker safety issue during the operations phase.

A state-wide survey was conducted by staff to determine the frequency of emergency medical response (EMS) and off-site fire-fighter response for natural gas-fired power plants in California. The purpose of the analysis was to determine what impact, if any, power plants may have on local emergency services. Staff has concluded that incidents at power plants that require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has mostly volunteer fire-fighting staff. However, staff has determined that the potential for both work-related and non-work related heart attacks exists at power plants. In fact, staff’s research on the frequency of EMS response to gas-fired power plants shows that many of the responses for cardiac emergencies involved non-work related incidences, including visitors. The need for prompt response within a few minutes is well documented in the medical literature. Staff believes that the quickest medical intervention can only be achieved with the use of an on-site defibrillator; the response from an off-site provider would take longer regardless of the provider location. This fact is also well documented and serves as the basis for many private and public locations (e.g., airports, factories, government buildings) maintaining on-site cardiac defibrillation devices. Therefore, staff concludes that with the advent of modern cost-effective cardiac defibrillation devices, it is proper in a power plant environment to maintain such a device on-site in order to convert cardiac arrhythmias resulting from industrial accidents or other non-work related causes. Therefore, an additional condition (**WORKER SAFETY-5**) is proposed which would require that a portable automatic cardiac defibrillator be located on site.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

None received.

CONCLUSIONS

Staff concludes that the proposed RCEC amendment does not, for the most part, significantly change the analysis conducted for the original project in the area of worker safety and fire protection. Although the general nature of hazards and therefore the impacts to workers safety and fire protection have not changed with this amendment, staff believes that workplace safety measures have advanced in the interim and therefore proposes mitigation measures to further reduce impacts on worker safety and

fire protection to insignificance. Staff also recommends a minor amendment of one existing condition.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout will be used to indicate deleted language and underline for new language.

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;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

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 provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have over-all authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA & federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Worker Safety 1 and 2 are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in

Worker Safety 3, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: Prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic cardiac defibrillator is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times.

Verification: At least 30 days prior to the start of site mobilization the project owner shall submit to the CPM proof that a portable automatic cardiac defibrillator exists on site and a copy of the training and maintenance program for review and approval.

REFERENCES

California Energy Commission (CEC), 2002a. (tn: 26086). Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

Petition for Amendment NO. 1, (RCEC), 2006a. Russell City Energy Center. 11/17/2006. Rec'd 11/17/2006.– Russell City/M. Hartfield (tn: 38410).
CEC 2002a – California Energy Commission (tn: 26086). Final Staff Assessment.

California Energy Commission/Commissioners (CEC) 2002b (tn:26635). Commission Decision for Russell City - POS.

ENGINEERING ASSESSMENT

FACILITY DESIGN

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Facility Design findings and conclusions incorporated in the original Energy Commission Decision remain valid. The project, as amended, would likely comply with all applicable engineering laws, ordinances, regulations, and standards (LORS).

INTRODUCTION

This analysis addresses only those aspects of the RCEC project that have changed as a result of the proposed amendment and that affect the project's compliance with engineering LORS. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) Changes due to the proposed amendment that could affect project facility design include replacing the Advanced Water Treatment Plant with a Zero Liquid Discharge Facility and a Title 22 Recycled Water Facility, and deleting the standby generator (RCEC 2006a, § 1.1).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

The engineering LORS applicable to the project have not changed since the project was certified by the Energy Commission, except the following minor changes. Dames & Moore (1995) Seismic Retrofit Study for the City of Hayward Utility Structures was applicable to design and construction of the Advanced Water Treatment Plant that was planned to be owned by the City of Hayward. Because this facility is no longer part of the project, and as described in the amendment, no other project related utility structures will be owned by the City, this LORS no longer applies to the project. In addition to the above change, the applicable edition of the California Building Code (CBC) shall be revised from 1998 to the current edition, 2001, as shown below. The key engineering LORS are described in **FACILITY DESIGN Table 1**:

FACILITY DESIGN Table 1
Key Engineering Laws, Ordinances, Regulations and Standards (LORS)

Applicable LAW	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
State	1998 2001 California Building Code (CBC)
Local	Riverside County, Regulations and Ordinances
	Dames & Moore (1995) Seismic Retrofit Study for the City of Hayward Utility Structures
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

The above project changes proposed in the amendment would result in the following minor modifications to the facility design conditions of certification. The project structures and equipment list would be revised to reflect the substitution of a Title 22 Recycled Water Facility and a Zero Liquid Discharge Facility for the Advanced Water Treatment Plant, and the deletion of the standby generator (RCEC 2006a, § 1.1). All references to 1998 edition of the CBC would be revised to 2001. And, the reference to Dames & Moore (1995) study for the design and construction of the Advanced Water Treatment Plant would be deleted.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Assessment of impacts and discussion of mitigation in the area of Facility Design as described in the Energy Commission Decision have not changed and this amendment does not require any revisions to the original analysis (CEC 2002a FSA, p. 46).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public comments regarding facility design.

CONCLUSIONS

The Facility Design findings and conclusions incorporated in the original Energy Commission Decision remain valid. The project, as amended, would likely comply with all applicable engineering (LORS). To ensure this, staff recommends that the conditions of certification embodied in the original Energy Commission Decision be retained, with the following minor revisions.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Energy Commission Decision, with the following exceptions. Condition of Certification **GEN-1** has been modified to reflect the inapplicability of the Dames & Moore study as the result of deleting the Advanced Water Treatment Unit from the project description. Condition of Certification **GEN-2, Table 1: Major Structures and Equipment List**, has been revised to reflect the changes in the list of facilities and equipment as described above. Conditions of Certification **GEN-1** through **ELEC-1** have been revised to reflect the current edition of the CBC. Strikeout has been used to indicate deleted language, and underline to indicate new language.

GEN-1 The project owner shall design, construct and inspect the project in accordance with the ~~4998~~2001 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.

In the event that the initial engineering designs are submitted to the CBO when a successor to the ~~4998~~2001 CBC is in effect, the ~~4998~~2001 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 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 [~~4998~~2001 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 <u>Title 22 Recycled Water Facility</u> 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
Boiler Feedwater Pump Building Structure, Foundation and Connections	1
Emergency Generator <u>Zero Liquid Discharge Facility</u> Structure, 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

Equipment/System	Quantity (Plant)
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	1 Lot
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure Piping	1 Lot
HVAC and Refrigeration Systems	1 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 ~~4998~~2001 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.

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.

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 [~~4998~~2001 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.

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.

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~~2001 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~~2001 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~~2001 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~~2001 CBC, section 104.2.4, Stop orders].

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.

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 Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the ~~1998~~2001 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.

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~~2001 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~~2001 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~~2001 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~~2001 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~~2001 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.

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 [49982001 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.

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 [49982001 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~~2001 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~~2001 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 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~~2001 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~~2001 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~~2001 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the ~~1998~~2001 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~~2001 CBC, Section 106.3.2, Submittal Documents, Section 108.3, Inspection Requests, Section 108.4, Approval Required; ~~1998~~2001 California Plumbing Code, Section 103.5.4, Inspection Request, Section 301.1.1, Approval].

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~~2001 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~~2001 CBC, Section 108.3 – Inspection Requests].

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for 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.

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~~2001 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 4998~~2001, 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 [~~4998~~2001 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.

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.

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.

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

California Energy Commission/Commissioners (CEC) 2002b (tn:26635). Commission Decision for Russell City - POS.

RCEC 2006a. Russell City Energy Company, LLC, Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

GEOLOGY AND PALEONTOLOGY

Testimony of Patrick Pilling, Ph.D., P.E., G.E.

SUMMARY OF CONCLUSIONS

The proposed amendment includes locating the facilities approximately 1,300 feet to the northwest of the original plant site; however, the underlying soils deposits are generally consistent with those mapped at the previous site (Russell City Energy Company, LLC [RCECa], 2007). In addition, the geologic hazards present at the Russell City Energy Center (RCEC) are essentially the same as those present at the previous site and include strong ground shaking, potential liquefaction during an earthquake, potential differential settlement of heavily loaded structures, and expansive clay soils. These potential hazards can be effectively mitigated through facility design as required by the California Building Code (2001) and conditions of certification. No significant geologic resources are present, but paleontological resources have been documented in the general area of the project. The potential impacts to paleontological resources due to construction activities will be mitigated as required by conditions of certification.

Based on this information, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project, is low. It is Energy Commission staff's opinion that the RCEC can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS), and in a manner that protects environmental quality and assures public health and safety.

INTRODUCTION

In this section, Energy Commission staff discusses potential impacts of the proposed amendment in relation to geologic hazards, geologic (including mineralogic), and paleontologic resources. This analysis covers only those aspects of the RCEC project that have changed as a result of the proposed amendment and that affect staff's testimony for geology and paleontology as contained in the Commission Decision (CEC, 2002b). (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS)- COMPLIANCE

Since publication of the Commission Decision (CEC, 2002b), there have been no changes in the applicable laws, ordinances, regulations, and standards in relation to geology and paleontology.

SETTING

REGIONAL GEOLOGIC SETTING

The RCEC site is located along the eastern shore of the San Francisco Bay, within the limits of the Coast Ranges Physiographic Province. The San Francisco Bay fills a northwest-trending structural depression in the central Coast Ranges. This portion of the San Francisco Bay is located in a seismo-tectonically active region. Both the previous and proposed sites lie between the San Andreas Fault, which is located approximately 14 miles to the west, and the Hayward Fault, which is located approximately three miles to the east.

SITE GEOLOGY

The project site is underlain by unconsolidated soils that were deposited along the San Francisco Bay (Bay). Previous testimony (CEC, 2002a) estimates that young Bay mud is present in the project area to a depth of approximately 20 to 60 feet below existing grade, and is underlain at depth by older, more consolidated Bay mud deposits and ultimately by bedrock of the Franciscan Formation. The young Bay mud was most likely deposited in the last low sea-level stand approximately 11,000 years ago (Atwater et al., 1977). The contact between the old Bay mud and bedrock of the Franciscan Formation is estimated to be approximately 400 feet below the ground surface (Hazelwood, 1976).

Exploration at the previous plant site (RCECa, 2007) encountered approximately three feet of clayey sand fill at the ground surface. This fill is generally underlain by silty clay to the depths explored (150 feet), although beds of clayey sand have been reported (RCECa, 2007). The native silty clay soils were classified as moist to wet, soft near the ground surface (young Bay mud) to very stiff at depth (old Bay mud), and as exhibiting 55 to 100 percent low to high plasticity fines. The interbeds of granular soils were classified as very moist to wet, loose to medium dense, and as containing 20 to 40 percent low to high plasticity fines.

Groundwater was encountered at the previous plant site at a depth approximately six feet below existing grade in all borings.

No faults are mapped as passing through the subject site.

Based on site geology as described in the amendment (RCECa, 2006), site subsurface conditions and associated geologic hazards are expected to be very similar to those encountered at the previous plant site.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Since the subsurface conditions and associated geologic hazards at the proposed site are expected to be similar to those previously analyzed (RCECa., 2006; RCECa, 2007); potential geologic hazards and the thresholds for significance are essentially the same

as documented in the Commission Decision (CEC, 2002b). In addition, there are no significant geologic resources present in the project area.

The potential to encounter paleontological resources remains. Staff reviewed existing paleontologic information for the surrounding area, as well as site-specific information provided by the project owner (RCECa, 2006), in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The project owner has stated that, in general, the potential for geologic hazards to affect the site remains essentially unchanged, and that there is no potential to affect geologic resources. The project owner does, however, state that there is still the potential to encounter paleontological resources during construction of the project.

Staff's independent evaluation of the site confirms the project owner's position. Therefore, no additional mitigation over and above that already recommended is considered necessary.

Construction Impacts and Mitigation

As noted above, no viable geologic or mineralogic resources are known to exist in the area. Paleontological resources have been documented with two miles of the project site, and the native materials exhibit a high sensitivity rating with respect to containing significant paleontologic resources. Since construction of the proposed project will include significant amounts of grading, foundation excavation, and utility trenching, staff considers the probability that paleontological resources will be encountered during such activities to be high when native materials are encountered, based on SVP assessment criteria. Conditions of Certification **PAL-1** to **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

Operation Impacts and Mitigation

The geologic hazards present at the RCEC site are essentially the same as those present at the previous site and include strong ground shaking, potential liquefaction during an earthquake, potential differential settlement of heavily loaded structures, and expansive clay soils. These potential hazards can be effectively mitigated through facility design as required by the California Building Code (2001) and Conditions of Certification **GEO-1** and **GEO-2**.

CUMULATIVE IMPACTS AND MITIGATION

There are no changes to the cumulative impacts section of the Commission Decision caused by the proposed amendment changes. As a result, no additional mitigation is considered necessary.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments on geology and paleontology have been issued for the RCEC project.

CONCLUSIONS

The project owner will likely be able to comply with applicable LORS, provided that the proposed conditions of certification are followed. The project should have no adverse impact with respect to design and construction of the project, and geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed conditions of certification listed below

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

General conditions of certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section. Conditions of Certification **GEO-1** and **GEO-2** require that the project owner assign a certified Engineering Geologist to the project (**GEO-1**), and prepare an engineering geology report (**GEO-2**). These conditions are as follows:

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 2001 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 names(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 2001 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 of 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~~ 2001 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/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 the 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.

Paleontological conditions of certification are as follows:

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 on contacts familiar with the specialist's work of these referenced projects.

If the CPM determined 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 the 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 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, trending, 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 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: The closure requirements for paleontologic resources are to be based upon the Paleontologic Resource 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

SUMMARY OF CONCLUSIONS

The Power Plant Efficiency findings and conclusions incorporated in the original Energy Commission Decision remain valid. No laws, ordinances, regulations, and standards (LORS) apply to project efficiency.

INTRODUCTION

This analysis addresses only those aspects of the RCEC project that have changed as a result of the proposed amendment. There are no changes due to the proposed amendment that could affect project efficiency.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS - (LORS) — COMPLIANCE

No LORS apply to project efficiency.

SETTING

The project changes proposed in the amendment would not result in any modifications to Power Plant Efficiency as described in the original Energy Commission Decision.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The assessment of impacts and discussion of mitigation in the area of Power Plant Efficiency as described in the Energy Commission Decision have not changed, therefore, the proposed and this amendment does not require any revisions to the original analysis (Energy Commission Decision, p.68-69).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public comments regarding efficiency.

CONCLUSIONS

The Power Plant Efficiency findings and conclusions incorporated in the original Energy Commission Decision remain valid. No LORS apply to project efficiency.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification apply to power plant efficiency.

REFERENCES

Energy Commission Decision. California Energy Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

POWER PLANT RELIABILITY

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Power Plant Reliability findings and conclusions incorporated in the original Energy Commission Decision remain valid. No laws, ordinances, regulations, and standards (LORS) apply to project reliability.

INTRODUCTION

This analysis addresses only those aspects of the RCEC project that have changed as a result of the proposed amendment. There are no changes due to the proposed amendment that could affect project reliability. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

No LORS apply to project reliability.

SETTING

The project changes proposed in the amendment would not result in any modifications to Power Plant Reliability as described in the original Energy Commission Decision.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The assessment of impacts and discussion of mitigation in the area of Power Plant Reliability as described in the Energy Commission Decision have not changed. Thus, the proposed amendment does not require any revisions to the original analysis (Energy Commission Decision, p. 68-69).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public comments regarding reliability.

CONCLUSIONS

The Power Plant Reliability findings and conclusions incorporated in the original Energy Commission Decision remain valid. No LORS apply to project reliability.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification apply to power plant reliability.

REFERENCES

Energy Commission Decision. California Energy Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha, P. E. and Mark Hesters

SUMMARY OF CONCLUSIONS

The current System Impact studies (SIS) and the Facility study (FS) for the amended project with expected June 10, 2010, commercial operation date indicate that the interconnection of the Russell City Energy Center (RCEC) project to the California Independent System Operator (CA ISO) grid would have adverse impacts, with new overloads on the downstream transmission facilities of the Pacific Gas & Electric (PG&E) system. Accommodating the interconnection of the RCEC and its power output would require expansion and reconfiguration of the Eastshore substation 230 kV bus, and reconductoring of the Eastshore-San Mateo 230 kV line and the Eastshore-Dumbarton 115 kV line, and replacing the existing two 230/115 kV transformer banks with 420 MVA banks at the Eastshore substation. These network modification and upgrades planned by PG&E and selected by the petitioner as mitigation measures are considered effective to offset the adverse impacts and would ensure system reliability in accordance with the North American Reliability Council (NERC)/Western Electric Coordinating Council (WECC) & CA ISO planning standards, and are acceptable to staff.

The proposed new interconnection facilities to the CA ISO grid, which include the RCEC 230 kV switchyard and the double circuit 230 kV line to the PG&E Eastshore 230 kV substation bus, are adequate in accordance with good utility practices and acceptable to staff.

For the Eastshore-San Mateo 230 kV line (12.5-mile) and the Eastshore-Dumbarton 115 kV line (7-mile) PG&E reconductoring mitigation projects, general environmental analyses have been provided by the project owner in the amendment petition. Staff's 2002 environmental analysis report for the Eastshore-San Mateo 230 kV line reconductoring project is provided with this staff assessment as Appendix A.

The RCEC project would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS) assuming implementation of the recommended Conditions of Certification. Staff believes that the RCEC project would essentially supplement the local generation at Contra Costa, Pittsburg and the San Francisco peninsula, reduce power import to the area and enhance the reliability of the local electric grid.

INTRODUCTION

The Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conforms to all applicable (LORS) required for safe and reliable electric power transmission. Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the project owner. 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 the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and represent the “whole of the action.”

Energy Commission staff rely on the interconnecting authority for the analysis of impacts on the transmission grid as well as the identification and approval of required new or modified facilities downstream from the proposed interconnection required as mitigation measures. The proposed RCEC would interconnect to PG&E transmission network and requires analysis by PG&E and approval of the CA ISO.

PG&E’S ROLE

PG&E is responsible for ensuring electric system reliability in the PG&E system for addition of the proposed generating plant. PG&E will provide the analysis and reports in their System Impact and Facilities studies, and their approval for the facilities and changes required in the PG&E system for addition of the proposed transmission modifications.

CA ISO’S ROLE

The CA ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The CA ISO will review the studies of the PG&E system to ensure adequacy of the proposed transmission interconnection. The CA ISO will determine the reliability impacts of the proposed transmission modifications on the PG&E transmission system in accordance with all applicable reliability criteria. According to the CA ISO Tariffs, the CA ISO will determine the “Need” for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. The CA ISO will, therefore, review the System Impact Study (SIS) performed by PG&E and/or any third party, provide their analysis, conclusions and recommendations, and issue a preliminary approval or concurrence letter to PG&E. On completion of the PG&E Facility Studies, the CA ISO will review the study results, provide their conclusions and recommendations and issue a final approval/disapproval letter for the interconnection of the proposed RCEC. The CA ISO will provide verbal testimony on their findings at the Energy Commission hearings.

Russell City Energy Company, LLC (petitioner/project owner), the project owner, has filed a petition to the California Energy Commission to amend the certification of the RCEC project (01-AFC-7, certified 9-11-02) in order to construct a nominal 600 megawatt (MW) natural gas-fired combined cycle generating facility to be located in the City of Hayward. The amended project is expected to be on-line in June, 2010 (RC 2006a, section 1.1, Pages 1-1 to 1-2. Section 2.4-1, Page 2-16).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

- 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 and 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.
- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for 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 WECC system is based to a large degree on Section I.A of the standards, "NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table" and on Section I.D, "NERC and WECC 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) 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 along a common 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 (WECC 2002).
- North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards for Transmission System Contingency Performance. The

NERC Reliability standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).

- CA ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the CA ISO transmission grid facilities. The CA ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the CA ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The CA ISO Standards apply to all participating transmission owners interconnecting to the CA ISO controlled grid. They also apply when there are any impacts to the CA ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the CA ISO (CA ISO 2002a).
- CA ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the CA ISO controlled grid. The CA ISO determines the “Need” for the proposed project where it will promote economic efficiency or maintain System Reliability. The CA ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the CA ISO grid (CA ISO 2003a).

EXISTING FACILITIES AND RELATED SYSTEMS

The existing facilities in the vicinity of the RCEC project area include the following PG&E facilities:

- Eastshore 230/115 kV Substation with two 134/161 MVA 230/115 kV transformer banks.
- Eastshore-Grant double circuit 115 kV line.
- Eastshore-Dumbarton 115 kV line.
- Eastshore-Mt. Eden double circuit 115 kV line.
- Eastshore-San Mateo 230 kV line.
- Pittsburg-Eastshore 230 kV line.
- Pittsburg-San Mateo 230 kV line.

The project owner has proposed interconnection of the RCEC via a new double circuit 230 kV line at the Eastshore Substation, which is about a mile away from the project site and is located in the PG&E network where two major 230 kV bulk power lines and three 115 kV lines directly feed the South Bay and Peninsula load areas. In addition Eastshore Energy has submitted an Application for Certification (AFC, 06-AFC-6) for interconnection of their 115 MW Eastshore peaking plant at Eastshore 115 kV substation bus through a new 1.1 mile 115 kV line, the target on-line date being 2008. The RCEC and Eastshore generating plants would essentially serve the load centers of the San Francisco south bay area and the peninsula, reduce power import to the area,

supplement the local generation at Contra Costa, Pittsburg and the peninsula, and enhance the reliability of the local electric grid.

PROJECT DESCRIPTION

The RCEC revised 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), adjacent to and south of Depot Road and directly west of the City's Water Pollution Control Facility (WPCF). The new location is about 1,300 feet northwest of the original proposed location 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 about 180 MW and one steam turbine generator (STG), with a maximum output of 254 MW, for a total nominal plant net output of 600 MW (CB 2001a, AFC, Sections 2 & 6). Each of the CTG units will be connected to the low voltage terminal of a dedicated generation station unit (GSU) 150/200/250 MVA, 13.8/230 kV step-up transformer. The STG unit would be connected to the low voltage terminal of a dedicated GSU 180/240/300 MVA, 18/230 kV step-up transformer (RC 2006a, SISs).

SWITCHYARD AND INTERCONNECTION FACILITIES

The new RCEC 230 kV switchyard is proposed for a configuration of five-breaker 3,000-ampere ring bus arrangement for building five switch bays. Each breaker will be gas-insulated (GIS) with 3,000-ampere continuous rating and 63 kiloampere (kA) fault interrupting capacity. The high voltage terminals of GSU transformers would be connected by overhead conductors to three switch bays. The remaining two switch bays would be used for the new double circuit 230 kV overhead interconnection line to the East Shore 230 kV Substation. The project owner will build, own and operate the RCEC switchyard (PG&E 2001a, SIS).

The new RCEC 230 kV switchyard would be interconnected to the PG&E East Shore Substation 230 kV bus by building a new double circuit 230 kV line with 795 kcmil steel supported aluminum conductor (SSAC) on 120-foot high tubular steel poles. The length of the line would be either 1.33-miles or 1.21-miles depending on the selection of its alternate route options which are:

1. RCEC switchyard north-Depot Road east-Grant Eastshore corridor route,
2. RCEC switchyard southeast-Road along northern boundary of the City's WPCF-Grant Eastshore corridor route.

The major portion of the new line would run parallel with the existing East Shore-Grant 115 kV line along Enterprise Avenue within PG&E's existing transmission corridor.

To accommodate termination of the interconnecting line at the PG&E East Shore 230 kV Substation and insure reliability of the network, the existing three-breaker single 230 kV bus configuration of the Eastshore substation will be converted to a 3,000-ampere double bus (main and transfer buses) arrangement. The proposed modification in the Eastshore substation would consist of six 230 kV switch bays, each bay with a breaker and a half arrangement, for a total of nine 2,000-ampere breakers and twenty-four

2,000-ampere disconnect switches. Two switch bays would be used for connection of the two generator tie circuits, two switch bays for connection of the existing Eastshore-San Mateo and Pittsburg-Eastshore 230 kV lines, and two other switch bays for the two 230/115 kV substation transformer banks. The original project connected the existing Pittsburg-San Mateo 230 kV line that now passes through the East shore substation fence line to the East shore substation, as part of the amendment the Pittsburg-San Mateo 230 kV line will no longer be connected to the substation 230 kV bus for interconnection of the RCEC. In order to accommodate the above modifications the existing fence line of the Eastshore substation would be extended on the north and west to the adjacent existing PG&E property. PG&E would build, own and operate the new generator tie line and modified Eastshore substation (CB 2001a, AFC Section 6; RC 2006a, SISs and section 2.3, pages 2-10 & 2-13; CH2MHILL 2007b).

The configuration of the RCEC switchyard, the generator tie line to the modified Eastshore substation and its termination is in accordance with good utility practices and is acceptable to staff.

TRANSMISSION SYSTEM IMPACT ANALYSIS

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and the control area operator are responsible for insuring grid reliability. For the RCEC, PG&E and CA ISO are responsible for insuring grid reliability. In accordance with FERC/CA ISO/Utility Tariffs, System Impact and Facilities Studies are conducted to determine the preferred and alternate interconnection methods to the grid, the downstream transmission system impacts and the mitigation measures needed to insure system conformance with performance levels required by utility reliability criteria, NERC planning standards, WECC reliability criteria, and CA ISO reliability criteria (CA ISO 2002a and 2003a). Staff relies on the studies and any review conducted by the responsible agencies to determine the effect of the project on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards.

The System Impact and Facilities Studies analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation and thus are based on a forecast of loads, generation and transmission. Load forecasts are developed by the interconnected utility, which would be PG&E in this case. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties.

If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, the study will then identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the interconnecting utility determines that the only feasible mitigation includes

transmission modifications or additions which require CEQA review as part of the “whole of the action,” the Energy Commission must analyze these modifications or additions according to CEQA requirements.

SCOPE OF SYSTEM IMPACT STUDY (SIS) AND FACILITY STUDY (FS)

The June 30, 2005 PG&E SIS included a 2007 summer peak and a 2007 summer off peak case to reflect WECC’s transmission system, forecasted load and generation. The study was conducted with two CTG units for a net 354 MW RCEC generation output. The December 13, 2005 PG&E SIS included a 2008 summer peak and a summer off peak full loop case. The study was conducted with two CTG units and an additional STG unit for a total net 600 MW generation output from the RCEC plant. Both studies included planned CA ISO system upgrades that would be operational by 2007/2008, and queue generation and transmission projects higher than the RCEC queue. The potential generation scenarios in the San Francisco Bay area were modeled such as the retirement of the Hunters Point and Potrero power plants, and the operation of proposed City and County of San Francisco (CCSF) generating units. The study included a Power Flow analysis, a Transient stability analysis, a Short Circuit analysis and Substation Evaluation. The Power Flow Studies were conducted before and after the addition of the RCEC with a 1-in-10 year extreme weather summer peak load level for the greater bay area and a spring off peak load level for the PG&E system.

The November 2, 2006 PG&E FS determined the work scope and cost estimates for the generation tie line facilities and also necessary downstream network upgrades in the PG&E system assuming PG&E would engineer, construct, own and maintain the interconnecting facilities (except the RCEC switchyard) and engineer and construct the downstream upgrades (RC 2006a, SISs; CH2MILL 2007a, FS).

POWER FLOW STUDY RESULTS AND MITIGATION

The SISs and FS demonstrate that the existing PG&E transmission facilities are inadequate to accommodate interconnection of the RCEC. The addition of the RCEC would have adverse impacts on the PG&E system under 2007/ 2008 summer peak and summer off peak system conditions. In order to maintain system reliability downstream network upgrades would be required to facilitate interconnection of the proposed RCEC to the CA ISO grid. The power flow study results have been tabulated in the study reports (RC 2006a, SISs, Pages 14-16 and Appendix B).

Based on the results of the SIS, under 2007 summer peak normal system conditions there is a new overload identified in the PG&E system on the Eastshore-San Mateo 230 kV line due to the interconnection of the RCEC. Under certain contingencies, and during 2007/2008 summer peak and summer off peak system conditions, the SIS and FS reports identified the following overloads and corresponding mitigation measures (RC 2006a, SISs: CH2MHILL 2007a, FS; CH2MHILL 2007b):

- Eastshore- San Mateo 230 kV line: Besides the new overload identified on this line under 2007 summer peak normal system conditions, new overloads are also found on this line under 2007 summer peak and off peak system conditions for certain CA ISO Category B contingencies. Under 2007 summer peak system conditions, the pre-project overload on this line is substantially exacerbated due to the addition of the RCEC for the outages of the Newark-Ravenswood and Tesla-Ravenswood 230

kV lines. The mitigation measure, PG&E planned project number P02186, is part of the network upgrade needed to interconnect the RCEC to the CA ISO grid. The PG&E project involves reconductoring the 12.5-mile Eastshore-San Mateo 230 kV line with 954 kcmil SSAC conductor and replacing the 650 kcmil copper bus at San Mateo substation with 954 kcmil SSAC. The reconductoring project is expected to be completed by January, 2009. Staff considers the mitigation measures acceptable.

- Eastshore-Dumbarton 115 kV line: Substantial new overloads are identified under 2007 summer peak and off peak system conditions for certain CA ISO Category B and C contingencies. The mitigation measure, PG&E planned project number P02186, is part of the network upgrade needed to interconnect the RCEC to the CA ISO grid. The PG&E project involves reconductoring the 7-mile Eastshore-Dumbarton 115 kV line with 2-477 SSAC conductor and is expected to be completed by December, 2008. Staff considers the mitigation measure acceptable.
- Newark-Dumbarton 115 kV line: Substantial new overloads are found under 2007 summer peak and off peak system conditions for certain CA ISO Category B and C contingencies. However, the overloads on the line had since been eliminated due to completion of reconductoring of the 7-mile line with 795 kcmil SSAC conductor, in accordance with PG&E planned project number P01769, in December 2006.
- Eastshore substation two 230/115 kV transformer banks: New overloads are found on both the existing 134/161 MVA transformer banks due to outages of Eastshore-San Mateo 230 kV line and Metcalf generation plant under 2007 summer peak system conditions. The PG&E maintenance project P01951 would replace one of the transformer banks with a three-phase 420 MVA bank and it is expected to be completed by December, 2007. The PG&E network upgrade project P02186 for interconnection of the RCEC would replace the other transformer bank with a three-phase 420 MVA bank and it is expected to be completed by December 2009. Staff considers the mitigation measures acceptable.
- Sobrante-Morago 115 kV line: The pre-project overloads are exacerbated due to the addition of the RCEC for certain CA ISO Category B & C contingencies under 2008 summer off peak system conditions. The mitigation measures include installation of a Special Protection System (SPS) to reduce overload on the line or manual operational measures to curtail RCEC generation. Staff considers the mitigation measures acceptable.

SHORT CIRCUIT STUDY RESULTS AND SUBSTATION EVALUATION

The Short Circuit Study results identified that fault currents at the selected substations electrically adjacent to the project in the PG&E system would increase by 1 to 15 percent from the pre-project case due to the addition of the RCEC. The study data is used to determine if any equipment would be overstressed by the addition of the RCEC.

The Substation Evaluation (SE) determined that the existing 230 kV bus at the Eastshore substation can be extended to facilitate interconnection of the RCEC and will be reconfigured to a new breaker and a half scheme. From the short circuit study data the SE identified two 230 kV circuit breakers at the Pittsburg substation which are further overstressed due to interconnection of the RCEC. However, according to PG&E the RCEC project is not responsible for replacement of these overstressed breakers

using current PG&E guideline for breaker replacement where the added stress due to the project should be at least 5 percent and above. The evaluation further determined that the protection requirements for the project would require fully redundant, double-pilot current differential scheme utilizing dual fiber optic communications on the RCEC generator tie line and protective relay replacement at the San Mateo and Pittsburg substations.

Staff concurs with the evaluation and mitigation (RC 2006a, SIS, Pages 17-18 and 21).

TRANSIENT STABILITY STUDY RESULTS

The study identified no transient stability concerns in the PG&E system following selected disturbances for integration of the RCEC. Staff concurs with the study results (RC 2006a, SIS).

CA ISO REVIEW

The CA ISO originally issued their preliminary approval letter of September 10, 2001, for interconnection of the 600 MW RCEC plant to the CA ISO grid at the PG&E Eastshore substation based on the SIS performed by PG&E under 2004 system conditions for the expected second quarter of 2004 commercial operation date. Based on the results of the November 2, 2006 PG&E FS study for the expected June, 2010 commercial operation date, the CA ISO issued their final approval letter of November 7, 2006 to interconnect the 600 MW RCEC project to the CA ISO grid. The CA ISO's final approval ensures system reliability in the CA ISO grid and as such compliance with WECC/NERC and CA ISO Planning standards (CA ISO 2001a; CA ISO 2006a).

DOWNSTREAM FACILITIES

Besides the interconnection facilities which include the new RCEC switchyard and the proposed new double circuit 230 kV line between the RCEC 230 kV switchyard and the Eastshore 230/115 kV substation, accommodating the interconnection of the RCEC and its power output would require expansion and reconfiguration of the Eastshore substation 230 kV bus, and reconductoring of the Eastshore-San Mateo 230 kV line and the Eastshore- Dumbarton 115 kV line, and replacing the existing two 230/115 kV transformer banks with 420 MVA banks at the Eastshore substation. The existing fence line of the Eastshore substation would be extended within the adjacent existing PG&E property to accommodate expansion of the substation 230 kV bus and transmission outlets.

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 generation and Eastshore peaking plant will have some cumulative effects on the local 230 kV and 115 kV voltage network. Reconductoring of the Eastshore-San Mateo 230 kV line would result in local system effects in that it would provide greater flexibility in routing power in San Francisco south bay area and peninsula. Staff has provided a discussion on the cumulative transmission impacts for this project in Appendix A attached to this document.

The cumulative marginal impacts due to the RCEC, as identified in the SIS, will be mitigated. Staff also believes that there would be some positive impacts because the RCEC would provide additional reactive power and voltage support in the local network and reduce system losses in the PG&E system.

ALTERNATIVE TRANSMISSION ROUTES

For shifting the location of the RCEC plant site according to the amendment petition, the 230 kV generation tie line route between the RCEC switchyard and the Grant-Eastshore transmission corridor has changed, and for this length of the line (varying from 230 feet to 950 feet) two alternate routes have been considered. The major portion of the generation tie line would run parallel with the existing Eastshore-Grant 115kV line along Enterprise Avenue, within the existing PG&E transmission corridor. The project owner is seeking approval for both the alternate line route options. The preferred route option would be selected by PG&E based on availability of right-of-way (RCEC 2006a, Section 2.3, pages 2-10 & 2-13).

CONFORMANCE WITH LORS AND CEQA REVIEW

The SIS demonstrates that there would be adverse impacts in the PG&E system for the addition of the RCEC to the Eastshore substation. But the appropriate mitigation measures including network upgrades for reconductoring two transmission lines as planned would eliminate the adverse impacts. The interconnection, therefore, would conform to the NERC/WECC & CA ISO planning standards and PG&E reliability criteria.

The proposed new interconnecting facilities, the RCEC 230 kV switchyard, and the double circuit 230 kV line to the Eastshore substation including its modification, would be built according to the NESC standards and GO-95 Rules. The new facilities would be in accordance with good utility practices, would conform to engineering LORS and are acceptable to staff.

For the Eastshore-San Mateo 230 kV line (12.5-mile) and the Eastshore-Dumbarton 115 kV line (seven-mile) PG&E reconductoring projects, recent environmental analyses have been provided by the project owner in the amendment petition. Energy Commission staff is preparing a general CEQA analysis for reconductoring of the seven-mile Eastshore-Dumbarton 115 kV line. After reviewing the project owner's environmental assessment, staff prepared a report in 2002 for the potential environmental impacts of reconductoring the Eastshore-San Mateo 230 kV line as Appendix A to the final staff assessment during the certification process for the RCEC. The existing 230/115 kV transformer banks at the Eastshore substation would be replaced within the fence line of the existing substation and would not require any CEQA review.

The RCEC project would, therefore, meet the requirements and standards of all applicable LORS on satisfactory compliance of the Conditions of Certifications (CEC 2002a; RC 2006a, section 2.3.3, pages 2-13 to 2-15).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments related to the TSE discipline have been received.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. In accordance with the amendment petition, the proposed interconnecting facilities including the RCEC 230 kV switchyard, the double circuit 230 kV line to the Eastshore substation and its terminations are adequate in accordance with good utility practices and acceptable to staff according to engineering LORS.
2. The current SIS and FS demonstrate that the addition of the RCEC would have more adverse impacts on the PG&E transmission facilities under 2007/2008 summer peak and off-peak system conditions compared to the original plan for 2004 on-line date. New overloads are identified on several downstream facilities under normal and emergency system conditions. Accommodating the interconnection of the RCEC and its power output would require expansion and reconfiguration of the Eastshore substation 230 kV bus, and reconductoring of the Eastshore-San Mateo 230 kV line and the Eastshore-Dumbarton 115 kV line, and replacing the existing two 230/115 kV transformer banks with 420 MVA banks at the Eastshore substation. These network modification and upgrades planned by PG&E and selected by the project owner as mitigation measures are considered effective in eliminating the adverse impacts of the project and ensuring system reliability, and are acceptable to staff. The interconnection of the RCEC, therefore, would comply with the reliability LORs.
3. Based on the results of current PG&E FS study, the CA ISO issued their November 7, 2006 final approval letter for interconnection of the RCEC to the CA ISO grid based on the expected June 10, 2010 commercial operation date. The CA ISO's final interconnection approval to the RCEC also ensures system reliability and compliance with the WECC/NERC and CA ISO planning standards.
4. For the Eastshore-San Mateo 230 kV line (12.5-mile) and the Eastshore-Dumbarton 115 kV line (seven-mile) PG&E reconductoring mitigation projects, recent environmental analyses have been provided by the project owner in the amendment petition. Staff's 2002 potential environmental impact analysis report for the Eastshore-San Mateo 230 kV line reconductoring project is provided with this staff assessment as Appendix A.
5. The RCEC would, therefore, conform to the applicable LORS on satisfactory compliance of the recommended Conditions of Certifications.
6. The RCEC project would essentially serve the load centers of the San Francisco south bay area and the peninsula, reduce power import to the area, supplement the local generation at Contra Costa, Pittsburg and the peninsula, and enhance the reliability of the local electric grid. Staff believes that the RCEC project would also provide additional reactive power supply, voltage stability and reduce PG&E system losses.

RECOMMENDATIONS

If the Commission approves the amendment petition for the project, staff recommends the following conditions of certification to ensure system reliability and conformance with LORS.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout will be used to indicate deleted language and underline for new language.

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 and Wave-traps
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Insulators and Conductors
Grounding System

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 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3,

Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the 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 to 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 project owner shall submit the required number of copies of the design drawings and calculations to the CBO 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 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", CA ISO standards, National Electric Code (NEC) and related industry standards.
- b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to accommodate full output from the project and 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) The project conductors shall be sized to accommodate the full output from the project.
- e) Termination facilities shall comply with applicable PG&E interconnection standards.
- f) The project owner shall provide to the CPM:
 - i) A line route drawing after selecting one of the alternate route options for the generator interconnection 230 kV tie line.
 - ii) ~~The final Detailed Facility Study (DFS) from PG&E with the final selected mitigation plan for resolving identified reliability criteria violations including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,~~
 - iii) The executed ~~Facility Interconnection Agreement~~ project owner and CA ISO Large Generator Interconnection Agreement.
 - iv) ~~Verification of CA ISO Notice of Synchronization.~~
 - v) A letter stating that the mitigation measures or projects selected by the transmission owners for each criteria violation are acceptable,
 - vi) ~~The final interconnection approval letter form the CA ISO,~~
 - vii) The operational study report from the CA ISO and/or PG&E,

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agree to by the project owner and CBO, 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"¹ 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.

¹ Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

- d) A line route drawing after selecting one of the alternate route options for the generator 230 kV interconnection tie line.
- e) ~~The final DFS from PG&E with a final mitigation plan, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM.~~
- f) ~~The executed Facility interconnection Agreement project owner and CA ISO Large Generator Interconnection Agreement.~~
- g) ~~Verification of CA ISO Notice of Synchronization.~~
- h) A letter stating that the mitigation measures or projects selected by the transmission owners for each criteria violation are acceptable.
- i) ~~The final interconnection approval letter from the CA ISO.~~
- j) The operational study report from the CA ISO and/or PG&E.

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.

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (CA ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the CA ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the CA ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the CA ISO letter to the CPM when it is sent to the CA ISO one week prior to initial synchronization with the grid. The project owner shall contact the CA ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the CA ISO shall be provided electronically to the CPM one 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 electrical, 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”.

c) 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

CA ISO (California Independent System Operator) 1998a. CA ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

CA ISO (California Independent System Operator) 1998b. CA ISO Dispatch Protocol posted April 1998.

CA ISO (California Independent System Operator) 2001a. Letter of Preliminary Approval and Comments on the System Impact Study report for the RCEC project. Submitted 9-21-01.

CA ISO (California Independent System Operator) 2002a. CA ISO Planning Standards, February 7, 2002.

CA ISO (California Independent System Operator) 2003a. CA ISO, FERC Electric Tariff, First Replacement Vol. No. 1, March 11, 2003.

CA ISO (California Independent System Operator) 2006a. Letter of Final Approval dated 11-07-06 and comments on the Facility study for the RCEC. Submitted 11-17-06.

CB (Calpine-Bechtel) 2001a. Application For Certification for the Russell City Energy Center (01-AFC-7). Submitted to the Energy Commission on May 22, 2001.

CEC (California Energy Commission) 2002a. Final Staff Assessment for the RCEC.

CEC (California Energy Commission) 2002b. Commission Decision for the RCEC

CEC (California Energy Commission) 2006a. RCEC Amendment Data Requests. 12-22-06

RC (Russell City/M. Hartfield) 2006a. Petition for Amendment no.1, Russell City Energy Center, PG&E System Impact Study (SIS) reports dated June 30 & December 13, 2006. Submitted to the California Energy Commission on November 17, 2006.

CH2MHILL (CH2MHILL/D. M. Davy) 2007a. Project owners Responses to Staff Data Requests 1-52, PG&E Facility RE-study (FS) Report dated 11-02-06. Received 01-17-07.

CH2MHILL (CH2MHILL/D. M. Davy) 2007b. Responses from PG&E to follow up transmission questions. Received 02-05-07.

NERC (North American Electric Reliability Council) 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

WECC (Western Electricity Coordinating Council) 2002. NERC/WECC Planning Standards, August 2002.

DEFINITION OF TERMS

ACSR - Aluminum cable steel reinforced.

AAC - All Aluminum conductor.

Ampacity - Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere - The unit of current flowing in a conductor.

Kiloampere - (kA) 1,000 Amperes

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) would 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. 1,000 Volts.

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 - Megavolt 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 inductive loads like 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, would trip a selected generating unit upon a circuit overload.

SSAC - Steel Supported Aluminum Conductor.

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.

TRV - Transient Recovery Voltage

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.

PREPARATION TEAM

**RUSSELL CITY ENERGY CENTER PROJECT
AMENDMENT #1
PREPARATION TEAM**

Executive Summary Jeri Zene Scott
Introduction Jeri Zene Scott
Project Description Jeri Zene Scott
Biological Resources Marc Sazaki
Hazardous Materials Management Alvin Greenberg, PhD
Noise And Vibration Steve Baker, P.E.
Socioeconomic Resources Amanda Stennick
Soil And Water Resources Richard Latteri
Transmission Line Safety and Nuisance Obed Odoemelam, PhD
Worker Safety and Fire Protection Alvin Greenberg, PhD
Geology and Paleontology Patrick A. Pilling, PhD, P.E., G.E.
Facility Design Shabab Khoshmashrab
Power Plant Efficiency Shabab Khoshmashrab
Power Plant Reliability Shabab Khoshmashrab
Transmission System Engineering Mark Hesters, P.E. / Ajoy Guha, P.E.
Compliance Project Secretary Marci Errecart
Siting Project Secretary Dora Gomez

DECLARATION OF
Jeri Zene Scott, Project Manager

I, Jeri Zene Scott declare as follows:

1. I am presently employed at the California Energy Commission, in the Siting Office of the Energy Facilities Siting Division as a Compliance Project Manager.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on the Executive Summary, Project Description and the Introduction for the Russell City Energy Center Project Amendment No. 1 based on my independent analysis of the amendment petition, 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 issues 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: March 28, 2007

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 California Energy Commission -- Energy Facilities
to present 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 California Energy Commission -- Energy Facilities
May 1994 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 California Energy Commission -- Energy Facilities
June 1991 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.

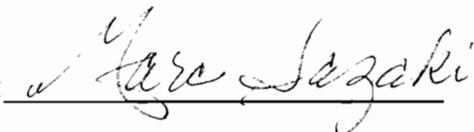
1979 Received AA degree from West Los Angeles Junior College.

**DECLARATION OF
MARC SAZAKI**

I, Marc Sazaki declare as follows:

1. I am presently employed at the California Energy Commission, in the Environmental Office of the Energy 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 prepared the staff testimony on the Biological Resources Section, for the Russell City Energy Center Project Amendment No. 1 based on my independent analysis of the amendment petition, 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 issues 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: 3/27/2007 Signed: 

At: Sacramento, California

RESUME

Marc Sazaki
Aquatic Biologist

California Energy Commission
1516 9th Street
Sacramento, CA 95814
(916) 654-5061

EDUCATION B.S. Biological Science with Chemistry Minor, California State University,
Sacramento

EXPERIENCE

November 1987 - Present California Energy Commission
Energy Facility Siting and Environmental Protection Division -
Planner II - Energy Facility Siting

Review and analyze the fisheries, and other aquatic and general biological concerns and impacts of proposed energy facilities and statewide energy plans. Coordinate post-certification compliance as it pertains to biological resources. Provide special expertise on the effects of energy facilities and aquatic biological resources, entrainment and impingement of fish and aquatic organisms from power plant cooling systems, aquatic biological monitoring programs, fisheries management and mitigation as related to energy facilities. Manage energy development grants that pertain to biological resources. Continue lead as lead biologist dealing with desert tortoise and manage CEC contracts supporting desert tortoise research and monitoring related to energy development in California.

December 1978 - November 1987 California Energy Commission
Siting and Environmental Division - Planner I - Energy Facility
Siting

Review and analyze the fisheries, and other aquatic and general biological concerns and impacts of proposed energy facilities and statewide energy plans. Provide special expertise on the effects of energy facilities and aquatic biological resources, entrainment and impingement of fish and aquatic organisms from power plant cooling systems, aquatic biological monitoring programs, fisheries management and mitigation as related to energy facilities. Assume lead biologist responsibilities for developing expertise on the desert

tortoise in relation to power plant siting and other energy related development.

November 1973 - California Department of Fish and Game - Region II
December 1978 Fisheries Management District - Assistant Fishery Biologist

As a district biologist, was responsible for carrying out fisheries management objectives, providing assistance to other Department branches and the public in general. Departmental branch assistance included stream surveys related to a proposed power plant project and their relicensing of an existing project. Work included an analysis of the impacts of these electrical generation projects upon downstream fisheries; and subsequent recommendations for maintenance of stream flow releases.

July 1972 - California Department of Fish and Game - Bay-Delta Project
November 1973 Fish Screen Design Unit, Assistant Fishery Biologist

Researched the biological aspects of fish salvage and screening technology used on various intake structures including those used on power plants. This work in the field and laboratory included studies of the swimming ability of various species of fish entrained in screened velocity chambers. The effects of the impingement of the fish entrained in screened velocity chambers. The effects of impingement of the fish on various size screens was also examined as well as their response to traveling screens of different design configuration.

July 1970 - California Department of Fish and Game - Bay Delta Project
June 1972 Louver Evaluation Team, Junior Aquatic Biologist

Responsible for the evaluation of the Delta Fish Protective Facility. Objective of the project was to experimentally determine the effectiveness of the selected fish screening technology. The technology is identical to that employed on several power plant intake structures. Work involved supervision of a field sampling crew, analysis of test results, and preparation of a written report including recommendations for future operation of fish screening operations at the intake structure.

May 1969 - California Department of Fish and Game - San Joaquin State Fish Hatchery,
June 1970 Fish and Wildlife Assistant

Implemented all aspects of spawning, rearing and stocking various strains of trout.

PROFESSIONAL
AFFILIATIONS/
CERTIFICATES

American Fisheries Society

"Desert Tortoise Survey Workshop" Certificate - June 2, 1990

"Wetlands Identification and Delineation" Certificate - May 23, 1991

"Desert Tortoise Survey Workshop" Certificate - October 23, 1993

"Certification of Attendance of U.S. Fish and Wildlife Service
Authorized Demonstration of Appropriate Tortoise Egg Handling" -
October 24, 1993

"Certification of Attendance of U.S. Fish and Wildlife Service
Authorized Demonstration of Appropriate Tortoise Artificial Burrow
Construction" - October 24, 1993

"Desert Tortoise Survey Workshop" Certificate - October 23, 1994

"Desert Tortoise Survey Workshop" Instructor Certificate - October
28, 1995

"Desert Tortoise Survey Workshop" Instructor Certificate - October
26, 1996

FEDERAL FISH AND WILDLIFE PERMIT AUTHORIZATION –
PRT-747907 (August 14, 1991)

WRITTEN REPORTS
AND/OR TESTIMONY

Some Preliminary Results on the Swimming Ability and Impingement Tolerance of Young-of-the-Year Steelhead Trout, King Salmon and Stripped Bass. Final Report for Anadromous Fisheries Act Project AFS-13. July 1, 1971 to June 30, 1972. Co-authors: M. Sazaki, J.E. Skinner, and W. Heubach.

Evaluation Testing Program Report for Delta Fish Protective Facility - state Water Facilities - California Aqueduct - North San Joaquin Division. Memorandum Report. 1973. Co-authors: W. Heubach, H. Hyde, M. Sazaki, and J.E. Skinner.

Southern California Edison - The California Coal Project. 79-NOI-3. Issues and Alternatives Report. May 1980. Biology Co-authors: M. Sazaki and R. Anderson.

Pacific Gas & Electric Company - Geysers Unit 18 Geothermal Power Plant -Sonoma County, Ca. Final Environmental Impact Report. April 1980. Biology Section Author: M. Sazaki.

Sacramento Municipal Utility District - 100 MW Photovoltaic Power Plant. Final Environmental Impact Report. April 1982. Biological Resources (Wildlife) Section Author: M. Sazaki.

NCPA Geothermal Project No. 3 - The Geysers KGRA - Lake and Sonoma Counties, California. Final Staff Assessment. July 1982. Biological Resources Section Author: M. Sazaki.

Central California Power Agency No. 1 - Coldwater Creek Geothermal Power Plant - Sonoma County. March 1985. Biological Resources Section Author: M. Sazaki.

Gilroy Energy Company, Inc. - Gilroy Foods Cogeneration Project - Santa Clara County. 84-AFC-3. Final Staff Assessment. May 1985. Biological Resources Section Author: M. Sazaki.

Luz Development & Finance Corporation's Solar Electric Generating Systems (SEGS) VIII, Harper Lake - San Bernardino County, California. Final Staff Assessment. December 1988. Biological Resources Section Author: M. Sazaki.

Luz Development & Finance Corporation's Solar Electric Generating Systems (SEGS) IX & X, Harper Lake - San Bernardino County, California. Final Staff Assessment. November 1989. Biological

Resources Section Author: M. Sazaki.

The Impacts of Global Warming on California - Interim Report. California Energy Commission. June 1989. Principal Authors: J. Anderson, L. Baxter, B. Dahlquist, A. Edwards, J. Nelson, M. Sazaki, K. Smith, T. Tanton, G. Walker, B. Croes, T. VanCuren.

Crockett Cogeneration Project B Contra Costa County, California. Docket No. 92-AFC-1. Final Staff Assessment. November 1992. Biological Resources Section Author: M. Sazaki.

California Energy Commission Decision (P800-93-007) - Application for a Small Power Plant Exemption Including: Revised Initial Study - Mitigated Negative Declaration. Carson Energy Group and Central Valley Financing Authority's Application for a Combined Cycle Cogeneration Facility and Ice Manufacturing Plant. Docket No. 92-SPPE-1. June 1993. Preparation Team: Marc Sazaki - Biological Resources.

California Energy Commission Initial Study - Application for a Small Power Plant. Shell Oil Company, Martinez, California. Shell Cogeneration Project. Docket No. 93-SPPE-1. December 1993. Preparation Team: Marc Sazaki - Biological Resources.

PITTSBURG DISTRICT ENERGY FACILITY. Docket No. 98-AFC-1. Final Staff Assessment. ARPIL 1999. Biological Resources Section Author: M. Sazaki.

**DECLARATION OF
Alvin J. Greenberg, Ph.D.**

I, **Alvin J. Greenberg, Ph.D.** declare as follows:

1. I am presently a consultant to the California Energy Commission, 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 the **Hazardous Materials Management, Worker Safety/Fire Protection, and Public Health** sections for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the amendment petition, 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: March 28, 2007

Signed: _____

A handwritten signature in cursive script, appearing to read "Alvin J. Greenberg", written over a horizontal line.

At: Sacramento, California

Risk Science Associates

121 Paul Dr., Suite A, San Rafael, Ca. 94903-2047

415-479-7560 fax 415-479-7563

e-mail agreenberg@risksci.com

Name & Title: **Alvin J. Greenberg, Ph.D., FAIC, REA, QEP**
Principal Toxicologist

Dr. Greenberg has had over 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, infrastructure vulnerability assessments, conducting lead surveys and studies, with particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, and the intrusion of subsurface contaminants into indoor air. 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 California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission. In addition to providing security expertise to the State of California, Dr. Greenberg is Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 25

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 - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association
American Chemical Society
American Association for the Advancement of Science
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002

Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)

September 2000 – February 2001

Member, State Water Resources Control Board Noncompliant Underground
Tanks Advisory Group

January 1999 – June 2001

Member, California Air Resources Board Advisory Committee on Diesel
Emissions

January 1994 - September 1999

Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic
Cleanup Program Advisory Committee

September 1998

Member, US EPA Workgroup on Cumulative Risk Assessment

April 1997 - September 1997

Member, Cal/EPA Private Site Manager Advisory Committee

January 1986 - July 1996

Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)

January 1988 - June 1995

Member: California Department of Toxic Substance Control Site Mitigation
Program Advisory Group

January 1989 - February 1995

Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992

Chair: Pollution Prevention and Waste Management Planning Task Force of the Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991

Member: California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988

ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987

California Department of Health Services Advisory Committee on County and Regional Hazardous Waste Management Plans

January 1984 - October 1987

Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987

Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986

Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous Waste

Jan. 1, 1983 - June 30, 1985

Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983

Member, Scientific Panel to Address Public Health Concerns of Delta Water Supplies, California Department of Water Resources

Present Position

January 1983- present

Owner and principal with Risk Sciences Associates, a Marin County, California, environmental consulting company specializing in multi-media human health and ecological risk assessment, air pathway analyses, hazardous materials management-infrastructure security, environmental site assessments, and litigation support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984

Member, State of California Occupational Safety and Health Standards Board (Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983

Assistant Deputy Chief for Health, California Occupational Safety and Health Administration

Feb. 1, 1979 - Aug. 1, 1979

Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979

Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975

Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Materials Management and Security, Hazardous Waste Site Characterization and Toxic Substances Control Policy for over 25 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Since the events of 9/11, Dr. Greenberg has taken the lead for the California Energy Commission in developing a power plant vulnerability assessment methodology and model power plant security plan. He also assisted the CEC in the preparation of a "background" report on the risks and hazards of siting LNG terminals in California and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. In August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state's Energy Emergency Preparedness Plan and make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the

Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead oxide contaminated soil at DOD facilities.

Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Ballard Canyon Air Pathway Analysis and Human Health Risk Assessment, Santa Barbara County, Ca. (September 2000)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Infrastructure Security

For the past three years, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has

interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks, management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan will be used by all power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California's energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He has also led an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, Dr. Greenberg is Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Sites with RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach, Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of \$750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on

another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara.

Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca. (March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca. (September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms.

Examples

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill,. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),

- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- San Francisco Energy Reliability Project, San Francisco, Ca. 2004-present. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials
- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR

**DECLARATION OF
Steve Baker**

I, **Steve Baker**, declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Energy Facilities Siting Division as a **Senior Mechanical Engineer**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **Noise and Vibration** for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the Application, supplements thereto, 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 issues 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: 3/27/07

Signed: 

At: Sacramento, California

STEVE BAKER, P.E.
Senior Mechanical Engineer

Experience Summary

Thirty-two 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 —
No. M27737 expires 6/30/06

Professional Experience

1990 to Present--Senior Mechanical Engineer, Facilities Siting Division - California Energy Commission

Technical lead person for the analysis of generating capacity, reliability, efficiency, noise, geology, paleontology 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
AMANDA STENNICK**

I, **AMANDA STENNICK** declare as follows:

1. I am presently employed at the California Energy Commission, in the **ENVIRONMENTAL OFFICE** of the Energy 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 prepared the staff testimony on the **SOCIOECONOMICS RESOURCES** for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the amendment petition, 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 issues 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: March 27, 2007 Signed: Amanda Stennick

At: Sacramento, California

AMANDA STENNICK

EDUCATION

B.A. 1986 University of California, Davis, Urban and Economic Geography

WORK EXPERIENCE

April 1998
present **Planner II.** California Energy Commission, Energy Facilities Siting and Protection Division.

Provide technical analysis of proposed energy planning, conservation, and development programs on land use and socioeconomic resources. Specific tasks include the analysis of potential land use and socioeconomic impacts, identification of mitigation measures, presentation of oral and written testimony for hearings on siting cases, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations. Recent work includes preparation of agenda and other materials for staff's environmental justice training seminar; research in the areas of demographics and poverty for environmental justice in siting cases; review of environmental justice legislation; research on energy and environmental justice issues specific to US/Mexico Border; as part of a team, authored the 2000 Quality Control Responsibilities for Division Products; authored the Environmental Justice sections for the 2001, 2003, and 2005 Environmental Performance Report; technical lead for land use section for 2005 Environmental Performance Report; CEQA review and comment on Cabrillo LNG Deepwater Port Facility NOI/NOP, City of Pittsburg Trans Bay Cable Project, and EIS/EIR for LNG facility in the Port of Long Beach.

Oct. 1993
to April 1998 **Planner I.** California Energy Commission, Energy Facilities Siting and Protection Division.

Provide technical analysis of proposed energy planning, conservation, and development programs on land use and socioeconomic resources. Specific tasks include the analysis of potential impacts, identification of mitigation measures, presentation of oral and written testimony for public hearings on siting cases, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations. Other work includes participation in the environmental justice task force; preparation of environmental justice white paper presented to Commissioners; research and preparation of discussion on discount rates and net present value for the SFEC siting project; preparation of socioeconomic section on 1996 Quincy Library Group Report; preparation of forestry section on 1997 CEC Global Climate Change Report; demographic research for environmental justice issues in siting cases.

1992
to
1993

Project Manager/Environmental Analyst/Planner. Beak Consultants.

Environmental Planner for EIR/EA for the Mammoth County Water District. Analyzed potential impacts resulting from lake water transfers and maintenance of in-stream flows in the Mammoth Lakes Basin; prepared land use, socioeconomics, recreation, and public services and utilities sections of EIR/EA; provided team project management.

Environmental Planner for an Effluent Treatment Plant EIR for Simpson Paper Company in Humboldt County. Authored land use, socioeconomics, recreation, public services and utilities, cumulative impacts sections, and mitigation monitoring; provided team project management.

Environmental Planner for Folsom/SAFCA Reoperation. Work involved determining parameters of project description with respect to water modeling, project geographic boundaries, and agency jurisdictional boundaries; ensured compliance with federal, state, and local plans and policies; provided team project management.

1990
to
1992

Environmental Analyst/Project Manager. ECOS. Inc.

Project Manager/Planner. EIR for a Planned Development, General Plan Amendment, and rezone request for a 504-acre Business and Industrial Park expansion for the Port of Sacramento. Prepared work scope and budget for Public Improvements Plan and Specific Plan for an 80-acre Mixed Use/Water Related development, including a Mitigation Monitoring Plan and Statement of Overriding Considerations for the City of West Sacramento. Specific tasks included coordination with subcontractors on technical sections of EIR, meetings with Assistant Port Director and City staff to present Public Improvements Plan, Specific Plan, tentative parcel map, and critical project phasing; and discussion with CDFG and Port staff on regional approach to mitigation for project-impacted endangered species.

Project Manager/ Planner. EIR for the Wildhorse Residential/Recreational Planned Development for the City of Davis. Specific tasks included CEQA compliance, writing technical sections on land use, project alternatives, and cumulative impacts, and determining appropriate project alternatives based on traffic models and allowable housing densities.

Project Manager. Yolo County Powerline Ordinance. Project tasks included developing siting policies and mitigation measures for placement of powerlines and substations in Yolo County.

- 1989
to
1990 **Assistant Planner.** Sacramento County Planning Department.
- Principal Author. Energy Component of the Public Services and Facilities Element of the Sacramento County General Plan. Coordinated work efforts with the CEC, SMUD, and PG&E to develop environmental and siting policies for energy facilities and transmission lines; identified environmental impacts and appropriate mitigation measures.
- 1987
to
1989 **Planner/Assistant Planner.** Yolo County Community Development
- Planning liaison for Homestake Mining Company's McLaughlin Mine. Conducted meetings on the Technical Review Panel's environmental monitoring of HMC's McLaughlin Mine; prepared staff reports on the implementation of use permit phasing on water quality and impacts of the tailings pond on biologic resources; organized site visits to monitor the revegetation plan and other mitigation measures as specified in the use permit; presented oral and written staff reports to the Planning Commission.
- 1988 **Consultant.** Pan Pacific Energy Development Corporation.
- Consulting job to develop a regional energy plan for rural areas of developing countries including decentralized non-fossil fuel power plants in agricultural regions. Attended IREC and AWEA International Conference in Honolulu.

PROFESSIONAL AND CONTINUING EDUCATION

- 1988 California Environmental Quality Act (UC Davis)
- 1989 Subdivision Map Act (UC Davis)
- 1991 Fiscal Impact Analysis (UC Davis)
- 1994 APA Conference (San Francisco)
- 1994 Environmental Justice Conference (UC Berkeley)
- 1998 California Environmental Quality Act (California Energy Commission)
- 1999 Roundtable on Environmental Justice US/Mexico Border
- 2000 Local Agency Formation Commission - LAFCO (UC Davis)
- 2005 Geographic Information System – GIS (UC Davis)
- 2006 Mapping Your Community GIS and Community Analysis (Sacramento, CA)

PROFESSIONAL AFFILIATIONS

Association of Environmental Professionals
American Planning Association

**DECLARATION OF
RICHARD LATTERI**

I, Richard Latteri declare as follows:

1. I am presently employed at the California Energy Commission, in the Environmental Office of the Energy 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 prepared the staff testimony on the Soil and Water Resources, for the Russell City Energy Center Project Amendment No. 1 based on my independent analysis of the amendment petition, 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 issues 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 Latteri Signed: 3/30/07
At: Sacramento, California

RESUME

Richard W. Latteri

System Assessment & Facilities Siting Division
California Energy Commission
1516 Ninth Street, MS 40
Sacramento, CA 95814
(916) 651-8859

PROFESSIONAL EXPERIENCE:

- 2001-Present** **California Energy Commission – Planner II:** Technical specialist with the Environmental Office providing analysis of water and soil resources for proposed energy facilities. Specific tasks include the analysis of potential impacts, identification of suitable mitigation measures, preparation of testimony, and project monitoring to ensure compliance with applicable requirements.
- 1993-2001** **Department of Water Resources – Senior Electric Utilities Engineer:** Chief, Power Cost Allocation Section with the State Water Project Analysis Office responsible for the supervision of technical staff in the determination and allocation of State Water Project power costs per the provisions of the Water Supply Contract with DWR's twenty-nine long-term State Water Contractors.
- 1989-1993** **Department of Water Resources – Senior Electric Utilities Engineer:** Chief, Electric System Planning Section with both the Energy Division and State Water Project Analysis Office responsible for supervising, planning and directing staff in the analysis of future generation and transmission requirements for the State Water Project.
- 1981-1989** **Department of Water Resources – Electric Utilities Engineer /Engineer Water Resources:** Performed both civil and electric utilities engineering duties in the areas of power plant construction management and as an electricity resource planner conducting supply and demand analyses for the State Water Project.

EDUCATION AND RELEVANT TRAINING

Bachelor of Science, Civil Engineering, California State University, Sacramento
Engineer Officer Course, U. S. Army Engineer School, Fort Belvoir, Virginia

**DECLARATION OF
Dr. Obed Odoemelam**

I, **Obed Odoemelam** declare as follows:

1. I am presently employed at the California Energy Commission, in the Environmental Office of the Energy 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 prepared the staff testimony on the Transmission Line Safety and Nuisance section for the Russell City Energy Center Project Amendment No. 1 based on my independent analysis of the amendment petition, 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 issues 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: March 28, 2007 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.

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Nine 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, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

2001-2004--Mechanical Engineer, Systems Assessment and Facilities Siting-- California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise and vibration, 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
PATRICK A. PILLING, Ph.D., P.E., G.E.

I, Patrick A. Pilling, declare as follows:

1. I am presently employed by Black Eagle Consulting, Inc. under contract with the California Energy Commission Facilities Siting and Environmental Protection Division as a Geotechnical Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **GEOLOGY AND PALEONTOLOGY**, for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the amendment petition, 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 issues 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: March 28, 2007

Signed: _____

At: Reno, Nevada



PATRICK A. PILLING, Ph.D., P.E., G.E.

Executive Vice President

Principal Geotechnical Engineer

Education

- § B.S. B Civil Engineering B1986 B Santa Clara University
- § M.S. B Civil Engineering B 1991 B San Jose State University
- § Ph.D. B Civil Engineering B 1997 B University of Nevada, Reno

Registrations

- P.E. - Civil - Nevada – No. 9153
- P.E. - Civil – California – No. C 49578
- P.E. - Geotechnical – California – No. GE 2292
- P.E. - Civil - Oregon – No. 19675PE
- P.E. – Geotechnical – Oregon – No. 19675PE
- P.E. - Civil – Arizona – No. 35310
- P.E. - Civil – Utah – No. 971338-2202

Associated Experience

- University of Nevada, Reno - Course Instructor - CE 771 - Mining Waste Containment Design
- University of Nevada, Reno - Course Instructor - CE 771 - Practical Foundation Engineering

Experience

1997 to Present: Black Eagle Consulting, Inc.; Executive Vice President. Dr. Pilling maintains over 18 years of construction, geotechnical, transportation, and mining engineering experience, and has supervised the engineering and construction of such projects throughout the western United States and South America. As Executive Vice President, Dr. Pilling oversees daily office operations, including personnel and accounting issues, coordinates company marketing efforts, and performs project management, engineering and laboratory analyses, and report preparation on most projects. Dr. Pilling presently serves as our project manager of the Reno Retrack construction management team reviewing geotechnical design submittals for this rail project.

1996 to 1997: SEA, Incorporated; Senior Geotechnical Engineer. Dr. Pilling provided project coordination, management, supervision, and development, and performed field exploration, engineering analyses, and report preparation.

1990 to 1996: WESTEC; Project Manager. Mr. Pilling was responsible for general geotechnical analyses on most projects, as well as design, management, and permitting of heap leach and tailings storage facilities projects. His experience varied from foundation design recommendations for small pump house structures to detailed liquefaction and seepage/slope stability analyses for large earthen embankments.

1986 to 1990: Case Pacific Company; Project Manager. Mr. Pilling provided cost estimating, project management, and contract negotiation on a wide variety of projects. Responsibilities included design and

construction of drilled shafts, earth retention, and underpinning systems, in addition to construction scheduling and cost control.

Affiliations

- § American Public Works Association
- § American Concrete Institute: Concrete Field Testing Technician Grade I
- § National Society of Professional Engineers
- § Secretary/Treasurer - National Society of Professional Engineers, Northern Nevada Chapter
- § American Society of Civil Engineers
- § International Association of Foundation Drilling
- § National Council of Examiners for Engineering and Surveying
- § American Society of Engineering Education
- § Deep Foundations Institute

Publications

- Ashour, M., P. A. Pilling, G. M. Norris, and H. Perez, June 1996, ADevelopment of a Strain Wedge Model Program for Pile Group Interference and Pile Cap Contribution Effects,@ Report No. CCEER-94-4, University of Nevada, Reno; Federal Study No. F94TL16C, Submitted to State of California Department of Transportation (CalTrans).
- Ashour, M., P. A. Pilling, and G. M. Norris, March 1997, ADocumentation of the Strain Wedge Model Program for Analyzing Laterally Loaded Isolated Piles and Pile Groups,@ Proceedings, 32nd Symposium on Engineering Geology and Geotechnical Engineering, Boise, Idaho, pp. 344-359.
- Ashour, M., P. Pilling, and G. Norris, 1998, “Updated Documentation of the Strain Wedge Model Program for Analyzing Laterally Loaded Piles and Pile Groups,” Proceedings, 33rd Engineering Geology and Geotechnical Engineering Symposium, University of Nevada, Reno, pp. 177-178.
- Ashour, M., G. Norris, and P. Pilling, April 1998, ALateral Loading of a Pile in Layered Soil Using the Strain Wedge Model,@ Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 124, No. 4, pp. 303-315.
- Ashour, M., G. M. Norris, S. Bowman, H. Beeston, P. Pilling, and A. Shamsabadi, March 2001, “Modeling Pile Lateral Response in Weathered Rock,” Proceeding 36th Engineering Geology and Geotechnical Engineering Symposium, University of Nevada, Las Vegas, 2001.
- Ashour, M., G. Norris, and P. Pilling, July/August 2002, “Strain Wedge Model Capability of Analyzing the Behavior of Laterally Loaded Isolated Piles, Drilled Shafts, and Pile Groups,” Journal of Bridge Engineering, ASCE, Vol. 7, No 4, pp. 245-354.
- Ashour, M., P. Pilling, and G. M. Norris, March 26 – 31, 2001, “Assessment of Pile Group Response Under Lateral Load,” Proceedings, 4th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, University of Missouri – Rolla, MO, Paper 6.11.
- Norris, G. M., M. Ashour, P. A. Pilling, and P. Gowda, March 1995, AThe Non-Uniqueness of p-y Curves for Laterally Loaded Pile Analysis,@ Proceedings, 31st Symposium on Engineering Geology and Geotechnical Engineering, Logan, Utah, pp. 40-53.

- Norris, G. M., P. K. Gowda, and P. A. Pilling, February 1993, AStrain Wedge Model Formulation for Piles,@ Report No. CIS 91-11, University of Nevada, Reno.
- Pilling, P. A., 1997, AThe Response of a Group of Flexible Piles and the Associated Pile Cap to Lateral Loading as Characterized by the Strain Wedge Model,@ Doctoral Dissertation, University of Nevada, Reno.
- Pilling, P. A. and P. V. Woodward, March 1995, ADependent Facility Closure in California,@ Proceedings, Mine Closure: Creating Productive Public and Private Assets, Sparks, Nevada, pp. 315-326.
- Pilling, P.A. and H. E. Beeston, March 1998, AExpansion Testing of Clay Soils in Forensic Investigations,@ Proceedings, 33rd Symposium on Engineering Geology and Geotechnical Engineering, Reno, Nevada, pp. 119-127.
- Pilling, P.A., M. Ashour, and G.M. Norris, 2001, “Strain Wedge Model Hybrid Analysis of a Laterally Loaded Pile Group,” Journal of the Transportation Research Board, Transportation Research Record No. 1772, Paper No. 01-0174, pp. 115-121.
- Pilling, P.A., July 2002, “Assessing the Liquefaction Potential of Sand Deposits Containing an Appreciable Amount of Gravel,” Program with Abstracts 2002 Annual Meeting Association of Engineering Geologists and American Institute of Professional Geologists, Reno, Nevada, p35.

Awards

- § Hugh B. Williams Industry Advancement Scholarship, International Association of Foundation Drilling (ADSC), 1993-94.
- § National Society of Professional Engineers, Northern Nevada Chapter, Young Engineer of the Year, 1996.

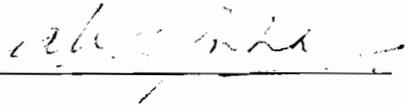
**DECLARATION OF
AJOY GUHA**

I, **Ajoy Guha**, declare as follows:

1. I am presently employed by the California Energy Commission in the **Transmission System Engineering unit** of the Energy Facilities Siting Division 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 Project Amendment No. 1** 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: June 21, 2007

Signed: 

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 & ILLINOIS
MEMBER OF IEEE; MEMBER OF THE INSTITUTION OF ENGINEERS OF INDIA

SUMMARY OF PROFESSIONAL BACKGROUND:

Ajoy Guha, P. E. has 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 FACILITIES 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
Mark Hesters**

I, **Mark Hesters** declare as follows:

1. I am presently employed at the California Energy Commission, in the **ENGINEERING OFFICE** of the Energy Facilities Siting Division as a **Senior Electrical Engineer**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on the **Transmission System Engineering**, for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the amendment petition, 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 issues 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: 3/29/08

Signed: 

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

Mark Hesters has fourteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission systems in several Commission power plant certification processes. Prior to that Mark worked in the CEC's Electricity Analysis Office providing lead analysis on Southern California Edison resource issues and modeling support for all areas of California. He holds a B.S. degree from the University of California at Davis in Environmental Policy Analysis and Planning.

