CALIFORNIA
ENERGY
COMMISSION

LOS ESTEROS CRITICAL ENERGY FACILITY II PHASE 2

Application For Certification (03-AFC-2)
Santa Clara County

FINAL STAFF ASSESSMENT

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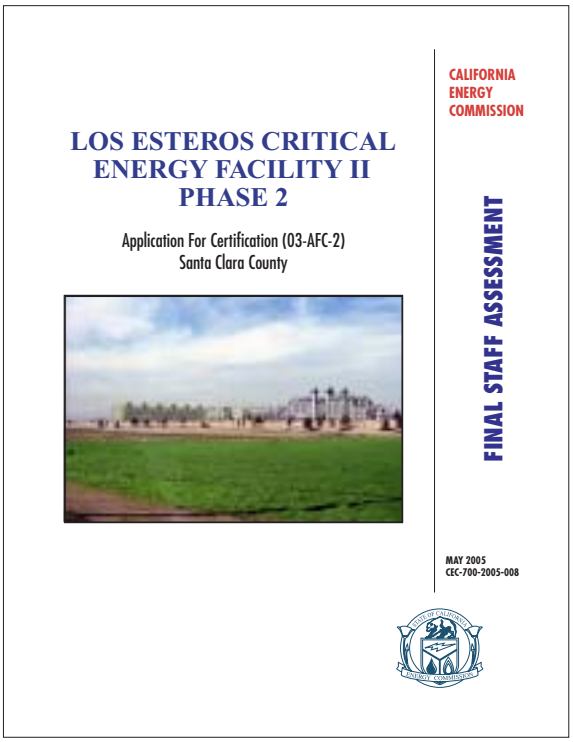
CEC-700-2005-008



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EXECUTIVE SUMMARY

INTRODUCTION

The Los Esteros Critical Energy Facility (LECEF) was originally licensed by the Energy Commission on July 2, 2002, as a simple-cycle natural gas-fired power plant. This license was issued under the emergency provisions of Public Resources Code section 25552, which requires relicensing of a project or conversion to combined-cycle operation within three years of the original license date. The project is owned and operated by the Los Esteros Critical Energy Facility, LLC, a wholly-owned subsidiary of Calpine. The owner requested two actions with this application (03-AFC-2): Phase 1 seeks a recertification of the license for the existing 180 megawatt (MW) simple-cycle facility for the life of the project, usually considered to be 30 years; and Phase 2 seeks a license to convert the LECEF to combined-cycle operation, adding equipment that will increase the output by 140 MW to a generating capacity of 320 MW. The Energy Commission approved the recertification of the simple-cycle license, Phase 1 of LECEF 2, on March 16, 2005 (CEC 800-2005-002-CMF).

This Final Staff Assessment (FSA) is the Energy Commission staff's independent analysis of the Los Esteros Critical Energy Facility Application for Certification Phase 2 (LECEF 2, Phase 2), for the conversion of LECEF to combined-cycle operation.

The LECEF 2, Phase 2 and related facilities such as the electric transmission lines, natural gas line, water supply lines and wastewater lines are under the Energy Commission's jurisdiction (Pub. Resources Code § 25500). When issuing a license, the Energy Commission is the lead state agency (Pub. Resource Code § 25519(c)) under the California Environmental Quality Act (Pub. Resource Code § 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (Cal. Code Regs., tit. 14 § 15251(k)).

It is staff's responsibility to complete an assessment of the project's potential effects on the environment and the public's health and safety, and to determine whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse public health, safety, and environmental effects of the construction, operation, and eventual closure of the project, if approved by the Energy Commission.

This Final Staff Assessment (FSA) for LECEF 2, Phase 2 is not the decision document for this proceeding nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. The FSA was completed following workshops on the Preliminary Staff Assessment, and input from agencies, the public, and the project owner. The FSA serves as staff's testimony in evidentiary hearings to be held by the Committee of two Commissioners who are hearing this case. The Committee will hold evidentiary hearings and will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The Energy Commission will make the final decision, including findings, after the Committee's publication of its Presiding Member's Proposed Decision.

BACKGROUND

Information for both Phases 1 and 2 are detailed in the single AFC filed December 30, 2003 (03-AFC-2). The original LECEF (01-AFC-12) project was filed with the Energy Commission on August 7, 2001, as an emergency project under provisions of Public Resources Code, section 25552. These provisions allowed for expedited review of the project and contained a provision requiring conversion to combined-cycle operation, or closing the facility within 3 years of the original certification by the Energy Commission (Pub. Resources Code, § 25552 (e)(5)(B)). This provision was modified by Senate Bill 28X (effective May 22, 2001) which added the option to recertify (renew the license) the project as a simple-cycle facility. The Energy Commission recertified the simple-cycle license on March 16, 2005.

The original LECEF (01-AFC-12), approved by the Energy Commission on July 2, 2002, licensed construction and operation of the 180 MW simple-cycle project at the current location, and discussed the plan to convert the facility to combined-cycle operation at a later date. Also analyzed was the potential development of the U.S. Dataport (USDP) data server farm project, possibly providing an opportunity for a Phase 3 project which would provide critical reliable energy and cooling that would be needed by such a facility. Though discussed in concept, the USDP construction was deemed too speculative for full analysis based upon market conditions and projections from the developer. USDP is still a speculative project, not likely to be constructed in the near future, and is not analyzed further in this document.

Calpine has changed the ownership of the LECEF project from the original owner/operator, C* Power, LLC, to the Los Esteros Critical Energy Facility, LLC. Both companies are wholly-owned Calpine subsidiaries. Additionally, there has been a change in the designated address of the facility from 1515 Alviso-Milpitas Road to the current 800 Thomas Foon Chew Way, the official designation for the completed 2,700 foot access road connecting from Zanker Road to the LECEF facility.

PROJECT DESCRIPTION

Located in Township 6S, Range 1W (the USGS Milpitas 7.5-minute quadrangle) in north San Jose, Santa Clara County, at 800 Thomas Foon Chew Way, the project is a fenced 21-acre site within a 34-acre parcel. Thomas Foon Chew Way is a 2,700 foot private access road curving through the adjacent buffer lands leading east to the project site and the Silicon Valley Power (SVP) Switching Station and Pacific Gas & Electric (PG&E) Los Esteros Substation from Zanker Road. The area is currently zoned light-industrial, and the parcel is covered by a proposed development zone designation specifically allowing the current power plant with a 180 MW output. No additional zoning action was required for Phase 1 recertification. However, for Phase 2, the City of San Jose is in the process of amending the zoning limitations on the parcel that limit the output of the project to 180 MW.

The project site is fenced on all sides with the south and east bounded by a sound wall on an elevated berm. The San Jose/Santa Clara Water Pollution Control Plant (WPCP) is across Zanker Road to the northwest of the site. The larger site is bounded on the

west by city buffer lands, and Zanker Road, and on the north by a strip of land on which Silicon Valley Power (SVP) has a newly-constructed 230 kV switching station, and the PG&E Los Esteros Substation. Undeveloped buffer lands and the WPCP sludge drying ponds lie further north of the project. The southern 13-acres of the parcel lie outside the fenceline of the power plant and are bordered by Alviso-Milpitas Road and State Route 237.

The current LECEF is powered by four LM6000 combustion turbine generators (CTGs) with spray intercooling injection (SPRINT) to enhance power and operates with selective catalytic reduction (SCR) to reduce carbon monoxide and nitrous oxide (NO_x) emissions. The project was designed to accommodate conversion to combined-cycle operation, and the four housings for the heat recovery steam generator equipment (HRSG's) and combustion exhaust stacks were constructed as part of the original project. The HRSGs also contain the equipment for the SCR emissions reduction systems. LECEF utilizes recycled water from the South Bay Water Recycling Program (SBWR) through one 18-inch diameter line, 1,500 feet in length, connecting with the SBWR recycled water main located in the City of San Jose's buffer lands west of the LECEF. LECEF returns used wastewater back to the WPCP facility through a wastewater collection pipeline to the west at Zanker Road. Electricity from LECEF is currently delivered to the grid through an interconnection to the PG&E 115 kV Los Esteros Substation-Nortech line at a point adjacent to the plant access road. The electricity interconnection for Phase 2 will be through two new 115/230 kV step-up transformers to be located in the LECEF switchyard and connecting to the SVP switching station at 230 kV via two 200-foot long overhead wires. Natural gas is supplied through a 550 foot-long 10-inch diameter line connecting to PG&E lines 101 and 109 located to the south and adjacent to State Route 237. Storm water run-off from the facility is collected and discharged to the Coyote Creek high-flow channel to the west. Completion of the discharge line, scheduled for 2005, will direct the stormwater run-off to the Coyote Creek low-flow channel.

Construction of the LECEF simple-cycle facility was completed and the LECEF became fully operational on March 7, 2003.

PROPOSED PHASE 2 PROJECT: COMBINED-CYCLE CONVERSION

The LECEF is located within a 34-acre project site that includes the 21-acre fenced area of the power plant and the facility's surrounding landscaping. The project site includes a vacant 13-acre site, adjacent to the south sound wall, proposed for use as the Phase 2 construction lay-down and parking area.

The PG&E Los Esteros Substation, and the intervening 2.5 acres of previously-vacant land now belonging to SVP, are immediately north of the LECEF (see **PROJECT DESCRIPTION Figure 2**). The SVP site contains the Silicon Valley Power (SVP) 230 kV Switching Station, and a 40X600 foot expansion of the PG&E Los Esteros Substation fenceline to accommodate new substation breakers which serve to interconnect the SVP and PG&E facilities at 230 kV.

Major equipment that will be added for the proposed Phase 2 conversion to combined-cycle operation, and depicted in the **Phase 2 PROJECT DESCRIPTION Figure 3,** includes the following:

- Tube sections and associated steam drums and piping to be installed within and around each of the existing HRSG casings;
- HRSG duct burners;
- A six-cell, plume-abated cooling tower array;
- A nominal 140 MW steam turbine generator (STG);
- Circulating water pumps and boiler feedwater pumps;
- A de-aerating surface condenser;
- A second 10,000 gallon aqueous ammonia storage tank to be installed within the existing secondary containment basin; and
- A 230 kV connection to the adjacent SVP switching station, including two 115/230 kV transformers within the existing LECEF switchyard requiring extension of the switchyard fence eastward.

Construction of the Phase 2 combined-cycle conversion could be accomplished in a phased manner, shutting down individual power trains of the simple-cycle facility for conversion while other power trains remained available for dispatch, or by shutting down the entire facility during conversion. These decisions would be driven by customer demand. A commissioning period for the Phase 2 combined-cycle facility could be as brief as two to four months, or could be extended depending upon the scenario presented at that time. The Phase 2 construction is expected to be completed by the summer of 2008.

Natural gas for the project is supplied at 250 to 400 pounds per square inch gauge through a 550-foot-long, 10-inch-diameter natural gas supply line between the facility and PG&E lines 101 and 109 which run parallel to the SR 237, south of the project site.

Electricity generated by LECEF is currently distributed to PG&E's 115 kV Los Esteros Substation-Nortech transmission line. This interconnection would be removed prior to the startup of the completed Phase 2, or at the time of connecting LECEF to the new SVP Switching Station. The combined-cycle project would expand the LECEF switchyard to include two 115/230 kV transformers connecting at 230 kV through two aerial lines. The new lines, approximately 200 feet in length, will connect the Phase 2 project to the SVP 230 kV Switching Station recently constructed between PG&E's Los Esteros Substation and the LECEF.

Please see the Project Description section of this FSA for a complete description of the Phase 2 project.

PUBLIC AND AGENCY COORDINATION AND OUTREACH

The Committee assigned to the current LECEF proceedings by the Energy Commission conducted an Informational Hearing and Site Visit on May 4, 2004. This hearing provided a forum for the public to learn about the project, the Energy Commission's process, ask questions, and voice their opinions regarding the proposed power plant.

When the AFC was filed, staff mailed a notice to all property owners adjacent to the proposed project informing them of the proposal and the Energy Commission's review process. Staff's notice also informed the property owners of the methods available for participating in the Commission's review of the proposal. In addition to these efforts and to ensure reaching a broad spectrum of the community, the Energy Commission's Public Adviser's Office (PAO) prepared posters for local distribution, prepared and distributed flyers to community organizations, malls, sensitive receptors, and local officials indicating the location of the AFCs in local and adjacent community libraries. In preparation for the Informational Hearing and Site Tour, the PAO sent personal letters of invitation to area elected officials, prepared and distributed a newsletter about the project, the site visit and the Informational Hearing to area school districts, neighborhood associations and numerous community groups, employers, and organizations. The PAO also distributed 12,000 one-page newspaper inserts with this information through three local newspapers.

Staff also coordinated their review with relevant local, state and federal agencies, including the City of San Jose, the City of San Jose Fire Department, the Santa Clara Valley Water District, the City of Milpitas, Santa Clara County, the California Independent System Operator, the Bay Area Air Quality Management District, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the California Department of Fish and Game. This FSA provides agencies and the public with the opportunity to review and comment on the Energy Commission staff's final analysis of the proposed project.

ENVIRONMENTAL JUSTICE SUMMARY

As part of the original LECEF staff analysis, staff completed a review of Census 2000 information that showed the minority population is greater than 50 percent within a six-mile radius of the LECEF power plant. The Census 2000 data indicates that the minority population within the six-mile radius of the project site is 69 percent. The percent of population considered low-income or living below the poverty level is less than nine percent within a six-mile radius of the LECEF. Since there is a greater than 50 percent minority population, staff completed a focused Environmental Justice assessment at that time. Because staff had originally determined that there are pockets or clusters of minority population within the six-mile radius, environmental justice concerns were incorporated into the original LECEF analysis (please refer to CEC, 2001a, p. 4.8-14, at www.energy.state.ca.gov/losesteros, and the associated **Socioeconomics Figures 1 and 3** in this assessment).

Potential Environmental Justice issues were then examined in ten technical areas: air quality, public health, visual resources, noise, hazardous material handling,

transmission line safety and nuisance, land use, water, waste disposal, and traffic and transportation. Staff's analysis in each of these areas concludes that, with the mitigation proposed, the project will have no unmitigated significant impacts. As a result, no disproportionate environmental justice impacts will result from either the continuation of the project through relicensing LECEF for the life of the project, or approval of the Phase 2 conversion to combined-cycle operation, if the conditions of certification proposed by staff are adopted.

STAFF'S ASSESSMENT

Each technical area section of the Phase 2 FSA contains a review of the Commission Decision, the new AFC, and changes in laws, ordinances, regulations and standards (LORS) since the project was completed. Staff's assessment also includes a discussion of impacts, and where appropriate, suggested modification of mitigation measures and conditions of certification. The Phase 2 FSA includes staff's assessments of changes to the following:

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

SUMMARY OF STAFF'S ANALYSIS

The following table summarizes the potential environmental impacts and LORS compliance for each technical area.

Technical Discipline	Environmental Impacts	LORS Conformance
Air Quality	Impacts mitigated	Yes
Biological Resources	Impacts Mitigated	Yes
Cultural Resources	Impacts mitigated	Yes
Facility Design	No impacts	Yes
Geology	Impacts mitigated	Yes
Hazardous Materials	Impacts mitigated	Yes
Land Use	Impacts mitigated	No
Noise	Impacts mitigated	Yes
Power Plant Efficiency	Impacts mitigated	Yes
Power Plant Reliability	No impacts	N/A
Public Health	Impacts mitigated	Yes
Socioeconomics	No impacts	Yes
Traffic and Transportation	Impacts mitigated	Yes
Transmission Line Safety	Impacts mitigated	Yes
Transmission System Engineering	Impacts mitigated	Yes
Visual Resources	Impacts mitigated	Yes
Waste Management	Impacts mitigated	Yes
Water and Soils	Impacts mitigated	Yes
Worker Safety	Impacts mitigated	Yes

The following highlights technical areas with items that are still being resolved.

Air Quality

The project's PM10 and PM2.5 operational emissions can, if left unmitigated, contribute to existing violations of the state 24-hour and annual PM10 standards, as well as the state annual PM2.5 standard, especially during the winter season. However, if the mitigation measures discussed in this assessment and in proposed Condition of Certification **AQ-SC9** are fully implemented, the potential for direct and secondary particulate matter emission impacts would be reduced to a level that is less than significant. Ammonia emissions could result in secondary PM impacts; this is mitigated by Condition of Certification **AQ-SC9**, which requires replacement of the catalyst before its performance deteriorates significantly.

Staff recommends additional construction related mitigation, which is described in conditions of certification **AQ-SC1** to **AQ-SC5**. Staff believes that with this addition, the project's construction impacts from PM10 and PM2.5 emissions will be mitigated to a less than significant level. A Final Determination of Compliance has not been issued. There may be changes to certain District conditions of certification that are incorporated into the Air Quality conditions of certification. Staff will review the FDOC and revise the District-required conditions as appropriate, submitting these revised conditions of certification as supplemental testimony at that time.

Land Use

On March 14, 2001, the San Jose City Planning Commission certified the US Dataport Planned Development Zoning Project EIR and recommended approval of the project to the San Jose City Council. On April 3, 2001, the City Council, acting as the CEQA Lead

Agency, approved the US Dataport Planned Development Zoning Project, and adopted an ordinance (No. 26343) to prezone and rezone the US Dataport site, which includes the proposed LECEF project site (LECEF, 2001). The San Jose City Council adopted this zoning on March 5, 2002, which became effective April 5, 2002. However, that adoption was based on the development of the LECEF simple-cycle project at 180 MW net output. Phase 2 will add an additional 140 MW in generation, for a total electrical output of 320 MW. Therefore, the zoning requirements need to be amended.

City staff will use the Energy Commission staff's FSA as their CEQA-equivalent document (City of San Jose 2004a). The applicant has submitted its final application package to the City, consistent with the project as analyzed in this FSA. The City of San Jose Planning Department intends to have the rezoning application heard by the Planning Commission in July, 2005. Following approval by the Planning Commission, the San Jose City Council would hear the matter during August, 2005 (City of San Jose 2005).

With the staff recommended conditions of certification contained in this FSA, and with the completion of the rezoning, the project will comply with LORS and will not cause any unmitigated adverse significant impacts to the environment, public health and safety, and the transmission system, provided the recommended conditions of certification are adopted and implemented.

LOS ESTEROS CRITICAL ENERGY FACILITY PHASE 2
FINAL STAFF ASSESSMENT
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INTRODUCTION

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PURPOSE OF THIS REPORT

The Final Staff Assessment (FSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Los Esteros Critical Energy Facility 2 Application for Certification (AFC) for the Phase 2 conversion of the Los Esteros Critical Energy Facility (LECEF) to combined-cycle operation. The LECEF is currently a 180 megawatt (MW) simple-cycle power plant designed to meet the demand for electricity during peak demand periods, whereas the combined-cycle facility analyzed in Phase 2 will be able to provide continuous operation in an efficient manner, providing an additional 140 MW of electricity to the northern San Jose and Santa Clara County area. This FSA is a staff document. It is neither a Committee document, nor a draft decision. The FSA describes the following:

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

The analyses contained in this FSA are based upon information from: 1) the current LECEF 2 AFC (03-AFC-2); 2) subsequent submittals; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications including the July 2, 2002 Energy Commission Decision for the original LECEF (01-AFC-12); 6) independent field studies and research; 7) a Final Staff Assessment and subsequent Energy Commission Decision for LECEF 2 Phase 1 published November 15, 2004, and March 16, 2005 respectively; and 8) Workshops on the Phase 2 project held in San Jose on February 1, 2005, and Sacramento February 15, 2005. The analyses for the technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

The 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., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

ORGANIZATION OF THE FINAL STAFF ASSESSMENT

This FSA contains the Phase 2 analysis of Calpine's request to convert the existing 180 MW simple-cycle LECEF power plant to a combined-cycle facility adding an additional 140 megawatts (MW) of electrical output for a total facility output capacity of 320 MW. The FSA contains an Executive Summary, Introduction, Project Description, and Project Alternatives. The FSA also contains the environmental, engineering, and public health and safety analysis of the proposed phase of the project in a discussion of 19 technical areas. Each technical area is addressed in a separate chapter. These chapters include the following: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, soil and water resources, geological and paleontological resources, facility design, power plant reliability, power plant efficiency, and transmission system engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, and a list of the staff that assisted in preparing this report.

Each of the 19 technical area assessments for the LECEF 2 Phase 2 conversion to combined-cycle operation includes a discussion of:

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

HISTORY OF THE LOS ESTEROS CRITICAL ENERGY FACILITY

LOS ESTEROS CRITICAL ENERGY FACILITY AND U.S. DATAPORT

The Los Esteros Critical Energy Facility was initially proposed by the applicant as an alternative to proposed diesel generation as a source of critical energy for a proposed computer server farm, U.S. DataPort (USDP), to be built at the current location. An environmental impact report and zoning action for the USDP was prepared and approved by the City of San Jose in 2001, but after discussions with the Energy Commission a decision to require more efficient gas turbine generation to replace the

original diesel power was made. At that time, the economic conditions in Silicon Valley softened, making the USDP server farm project unlikely in the near-term. There remained a state-wide need for increased electricity production, including within the northern San Jose region. The original LECEF power plant Application for Certification (AFC) was submitted for Energy Commission permitting (01-AFC-12) on August 6, 2001. The Energy Commission approved this project on July 2, 2002, and the LECEF began commercial operations on March 7, 2003. The original LECEF was filed and approved as an expedited emergency project in light of the state-wide energy crisis. The LECEF owner was required to recertify the project, or convert the plant to a combined-cycle facility within three years of the Energy Commission Decision to approve the project.

LOS ESTEROS CRITICAL ENERGY FACILITY 2

On December 30, 2003, Calpine, as Los Esteros Critical Energy Facility, LLC, filed a new AFC (03-AFC-2) seeking two actions from the Energy Commission:

Phase 1 sought recertification of the simple-cycle 180 MW facility to operate for the life of the project. Staff completed its updated analysis of the simple-cycle project and recommended that the Energy Commission approve the project with updated conditions of certification. On March 16, 2005, the Energy Commission voted to approve the Phase 1 relicensing of the existing simple-cycle LECEF (Order Number 05-0316-04).

Phase 2 of the LECEF 2 AFC seeks a license to convert the simple-cycle power plant to a combined-cycle facility by adding equipment and a steam turbine generator that will increase the electricity generation capacity by 140 MW for a total output of 320 MW.

The bases for the analyses and recommendations for the Phase 2 conversion of LECEF are the original Energy Commission Decision (01-AFC-12, July 2, 2002), the LECEF 2, Phase 1 Final Staff Assessment for recertification, and the Energy Commission Decision approving Phase 1 relicensing. Conditions of Certification are presented with key changes indicated in ~~strikethrough~~/<u>underline</u> format. The purpose of presenting the changes in this format is to provide transparency through the original LECEF project and the Phase 1 recertification process forward to the recommendations contained in this FSA for the LECEF 2, Phase 2 combined-cycle conversion project.

ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review power plant AFCs 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 AFC 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 the California Environmental Quality Act. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, §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 typically prepares both a preliminary and a final staff assessment for the project. The Preliminary Staff Assessment (PSA) presents for the applicant, interveners, agencies, other interested parties and members of the public, the staff's preliminary analysis, conclusions, and recommendations.

Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and this Final Staff Assessment, staff conducted a workshop on February 1, 2005, in San Jose in order for staff and parties to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. On February 15, 2005, a second workshop was conducted in Sacramento on the staff-proposed Conditions of Certification for Phase 2. Based on the workshops and written comments, staff has worked to reach agreement with the parties. This refined analysis, along with responses to comments on the PSA, are contained in this FSA which serves as staff's testimony on the LECEF 2, Phase 2 combined-cycle proposal.

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

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

Committee. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any intervener may request that the Energy Commission reconsider its decision.

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

Agency Coordination

As noted above, 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). However, the Commission typically seeks comments from and works closely with other regulatory agencies that administer LORS that may be applicable to proposed projects. These agencies include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, the local air district, and the California Air Resources Board.

PROJECT DESCRIPTION

Testimony of Robert Worl

INTRODUCTION

Phase 2 of this Application for Certification (03-AFC-2) seeks a license from the California Energy Commission to convert the Los Esteros Critical Energy Facility (LECEF), a 180 megawatt (MW) simple-cycle power plant, to a combined-cycle facility. This conversion would add 140 MW of generating capacity for a total output of 320 MW. LECEF is located in north San Jose, Santa Clara County, California. **PROJECT DESCRIPTION Figure 1** is an architectural rendering of the proposed combined-cycle facility. LECEF is owned by the Los Esteros Critical Energy Facility, LLC, a wholly-owned subsidiary of Calpine Corporation. A Final Staff Assessment (FSA) for Phase 1 of the LECEF, seeking to recertify the license for the current simple-cycle power plant for the life of the project (usually about 30 years) as required under Public Resources Code Section 25552(e)(5)(B), was issued separately on November 15, 2004. The Energy Commission approved the Phase 1 recertification, adopting updated conditions of certification for the project, on March 16, 2005.

Throughout documents referring to this project the acronym “LECEF” is used constantly. The current Application For Certification (AFC), with two separate phases being analyzed, increases the possibility for confusion. For clarity, the following acronyms may be used throughout this document:

LECEF : the originally licensed project, a simple-cycle power plant (01-AFC-12), and the power plant site generally;

LECEF 2: the current Application For Certification (03-AFC-2) covering the following:

Phase 1: the application to recertify or relicense the simple-cycle LECEF;

Phase 2: the application to convert LECEF to combined-cycle operation.

In this FSA, Phase 2 refers to the application to convert LECEF to combined-cycle operation as described in the current AFC, and Phase 1 refers to analysis by staff or actions by the Energy Commission associated with the recertification of the simple-cycle LECEF power plant.

Calpine originally applied for a license to build and operate the simple-cycle LECEF in August of 2001 under the expedited licensing provisions of California Public Resources Code (PRC) Section 25552. The Energy Commission granted the original simple-cycle license on July 2, 2002 and the LECEF began commercial operation in March 7, 2003. The simple-cycle LECEF was recertified for the life of the project (i.e. about 30 years) by the Energy Commission on May 16, 2005. The AFC suggests that the start of construction for Phase 2 combined-cycle conversion could be as early as September of 2006 with start up as early as January of 2008 (LECEF, LLC, 2003, p. 1-6).

The Phase 2 analysis is concerned only with the application to convert the LECEF to combined-cycle operation through the addition of equipment, changes to the operating profile and the authority to interconnect the proposed 230 kV electrical output to the grid

at the new Silicon Valley Power (SVP) Switching Station. The SVP facility was constructed on the 2.5 acre vacant site that lies directly north between LECEF and the Pacific Gas and Electric Los Esteros Substation. The SVP Switching Station was completed in early December of 2004.

The proposed combined-cycle conversion would result in increased consumption of natural gas and recycled water, changes to the point of the electrical transmission connection to the grid, and an increase in the electricity generating capacity of LECEF from 180 MW to 320 MW. All the required changes, except modifications within the SVP switchyard, would take place within the existing fenced 21-acre project site occupied by the current LECEF. Conversion of LECEF to combined-cycle operation will achieve higher efficiency and increase output by 140 MW to assist in serving local load with a total of 320 MW. Because the construction and operation of Phase 2 depends entirely on Phase 1 being in place and operational, the two licensing proceedings, Phase 1 and Phase 2, in part, draw on a single evidentiary record.

PROPOSED PHASE 2 PROJECT: COMBINED-CYCLE CONVERSION

The LECEF is located within a 34-acre project site that includes the 21-acre fenced area of the power plant and the facility's surrounding landscaping. The project site includes a vacant 13-acre site, adjacent to the south sound wall, proposed for use as the Phase 2 construction lay-down and parking area. The project address is 800 Thomas Foon Chew Way in north San Jose, California. South of the project parcel is State Route (SR) 237. To the east is agricultural land, and further east is Coyote Creek. To the north is agricultural land, San Jose/Santa Clara Water Pollution Control Plant (WPCP) buffer land that is open space, and further north are the WPCP sludge drying yards and ponds. To the west is undeveloped WPCP buffer land. Zanker Road runs north-south about 2,500 feet west of the LECEF. Access to the LECEF, as well as the SVP and PG&E electrical transmission facilities, is via the 2,700 foot-long Thomas Foon Chew Way from Zanker Road, with each facility having controlled access along this route.

The PG&E Los Esteros Substation, and the intervening 2.5 acres of previously-vacant land now belonging to SVP are immediately north of the LECEF (**PROJECT DESCRIPTION Figure 2**). The SVP site contains the Silicon Valley Power (SVP) 230 kV Switching Station, and a 40X600 foot southward expansion of the PG&E Los Esteros Substation fenceline needed to accommodate new substation breakers.

The project parcel and several surrounding parcels are located within an area designated as Light Industrial in the San Jose General Plan. The area is zoned Planned Development Zoning (PDZ). The PDZ zoning was originally requested by U.S. DataPort (USDP) for the purpose of constructing a large computer server center, including an energy center to provide reliable power and chilled water. The City of San Jose approved that PDZ designation in April 2001 (City Council Ordinance #26343, April 3, 2001; specific zoning PDSCH # 00-06-048). Subsequently, after agreeing to the current LECEF design, USDP and Calpine jointly applied for a revision to the PDZ to include the LECEF as the energy source for the potential data center and capable of independent operation. The City of San Jose approved the current PDZ designation in March 2002 (City Council Ordinance #26579, March 5, 2002; specific zoning PDSCH #

01-09-088). Phase 2 of the current project requires amending the PDZ to accommodate the addition of cooling towers and the increased output capacity of the combined-cycle facility. The applicant has submitted an application packet to the City of San Jose for that purpose, with meetings scheduled with the City to review and finalize the submission for April of 2005 (De Young, 2005). Due to current market conditions in the high technology sector, construction of the proposed USDP has not occurred and is unlikely in the near future.

As licensed and constructed, the LECEF simple-cycle power plant currently consists of the following features (see the **Phase 1 PROJECT DESCRIPTION Figures 3** and **4**):

- Four General Electric LM6000 SPRINT combustion turbine generators (CTGs) with water injection;
- Oxidation catalysts and selective catalytic reduction (SCR) pollution control equipment, installed within four heat recovery steam generator (HRSG) casings and stacks (these casings were installed during Phase 1 in anticipation of a later conversion to combined-cycle);
- A single-cell plume-abated cooling tower (2 cells were originally permitted);
- A 10,000 gallon aqueous ammonia storage tank;
- A 115-kilovolt-(kV) switchyard;
- A 150-foot-long, wood pole transmission line to PG&E's 115 kV Los Esteros Substation-Nortech transmission circuit, immediately to the west of the LECEF switchyard;
- A 2,700-foot-long primary access road, named Thomas Foon Chew Way, linking LECEF with Zanker Road;
- A 470-foot-long emergency access road, linking Thomas Foon Chew Way and Alviso-Milpitas Road;
- A 550-foot-long, 10-inch-diameter natural gas supply line between the facility and PG&E lines 101 and 109;
- A 1,500-foot-long recycled water supply line between the facility and the WPCP's recycled water supply pipeline in Zanker Road;
- A 2,000-foot-long sanitary sewer discharge line to the City of San Jose's sewer main in Zanker Road;
- A 1,000-foot-long storm water line between the facility and the Coyote Creek high – flow channel to the east. In accordance with existing Conditions of Certification, permit applications are currently in process for construction of a permanent stormwater outfall that extends the drain approximately 250 feet into the low-flow channel of Coyote Creek; and
- A 370-horsepower diesel fire pump.

Major equipment that will be added for the proposed Phase 2 conversion to combined-cycle operation, and depicted in **Phase 2 PROJECT DESCRIPTION Figure 3,** includes the following major components:

- Tube sections and associated steam drums and piping to be installed within and around each of the existing HRSG casings;
- HRSG duct burners;
- A six-cell, plume-abated cooling tower array;
- A nominal 140 MW steam turbine generator (STG);
- Circulating water pumps and boiler feedwater pumps;
- A de-aerating surface condenser;
- A second 10,000 gallon aqueous ammonia storage tank to be installed in the existing secondary containment basin; and
- A 230 kV connection to the adjacent Silicon Valley Power (SVP) switching station, including two 115/230 kV transformers within the existing LECEF switch yard which will require extending the LECEF switchyard fence eastward.

The applicant owns the 34-acre parcel within which the 21-acre fenced LECEF facilities and the proposed 13-acre construction parking and laydown area to the south are situated. The parcel is located in Township 6 South, Range 1 West; Latitude 37° 25'30", Longitude 121° 55' 50"; UTM zone 10, easting 594,500, northing 4,142,530 (NAD 27, UTM Zone 10). The project site is at an elevation of approximately 15 feet above sea level. The nearest residences are located approximately 0.6 mile southwest, 0.8 mile east, and 1.4 miles southeast of the project site center. San Francisco Bay lies approximately 7 miles west-northwest of the site.

Construction of the Phase 2 combined-cycle conversion could be accomplished in a phased manner, shutting down individual power trains of the simple-cycle facility for conversion while other power trains remained available for dispatch, or shutting down the entire facility during conversion. These decisions would be driven by customer demand for peak period electricity. A commissioning period for the Phase 2 combined-cycle facility could be as brief as 2 to 4 months, or could be extended depending upon the scenario presented at that time (Tetzloff, 2004).

WATER AND WASTEWATER

The recycled water supply for Phase 2 of the project will be provided by the WPCP through the South Bay Water Recycling (SBWR) program. The cities of San Jose and Santa Clara jointly own the WPCP facility, which the City of San Jose operates and maintains. Water from the SBWR recycled-water main comes to the site via a 1,500-foot-long pipeline, as shown on Phase 2 **PROJECT DESCRIPTION Figure 2**. The pipeline is routed south of the project site and turns west, along an existing utility corridor, to connect to the existing SBWR recycled water pipeline parallel to State Route 237 on the adjacent WPCP buffer lands. The facility is in the SBWR's recycled water service area, and the City of San Jose has adequate recycled water supplies to serve the facility. Recycled water from the SBWR program will be used for plant cooling and process water needs, and will be delivered via the same 1,500-foot pipeline built for the original LECEF. The line has the capacity to provide the annual average 1.313 million gallons per day (mgd) of recycled water required for the combined-cycle operation as well as the projected peak useage amount of 2.95 mgd. Wastewater discharge back to

the WPCP, through the existing 2000 foot-long sanitary sewer line, is projected at an average rate of 0.280 mgd, and at peak periods as high as 0.615 mgd. Potable water for use at the control room and administrative facilities is currently trucked to the facility.

STORM WATER

A 1,000-foot-long storm water line between the facility and the Coyote Creek high-flow channel to the east was completed during construction of the original LECEF. In accordance with the original LECEF (01-AFC-12) and the Phase 1 Conditions of Certification (**SOIL & WATER 3, 4, and 10**), permit applications are currently in process with the San Francisco Regional Water Quality Control Board and the U.S. Army Corps of Engineers for completing the construction of a permanent stormwater outfall that extends the drain approximately 250 feet into the low-flow channel of Coyote Creek. Completion is scheduled for 2005. The Phase 2 facilities are not expected to increase the volume of stormwater run-off coming from the project site and directed through the outfall line shown in **PROJECT DESCRIPTION Figure 2**.

NATURAL GAS SUPPLY

Natural gas for the project is supplied at a pressure of 250 to 400 pounds per square inch (psig) through a 550-foot-long, 10-inch-diameter natural gas supply line between the LECEF and PG&E lines 101 and 109 which run parallel to the SR 237, south of the project site (**PROJECT DESCRIPTION Figure 2**). On-site compressors will provide consistent pressure to the four turbines and the duct burners to be installed within the HRSGs. Combined-cycle natural gas use will increase from approximately 48,000 million British thermal units (MMBTU) per day, higher heating value (HHV) to approximately 61,344 MMBTU per day HHV during use of the added duct burners. HHV is the gross energy available from a fuel.

ELECTRICAL TRANSMISSION SYSTEM

Phase 2 Interconnection

Electricity generated by LECEF is currently distributed to PG&E's 115 kV Los Esteros Substation-Nortech transmission line. This interconnection would be removed prior to the startup of the completed Phase 2, or at the time of connecting LECEF to the new SVP Switching Station. The combined-cycle project would expand the LECEF switchyard to include two 115/230 kV transformers connecting at 230 kV through two aerial lines. The new lines, approximately 200 feet in length, will connect the Phase 2 project to the SVP 230 kV Switching Station recently constructed between the PG&E Los Esteros Substation and the LECEF. These features are illustrated in **PROJECT DESCRIPTION Figure 2 and Figure 3**.

Silicon Valley Power, the municipal utility for the City of Santa Clara, is engineering a new 230 kV line between its Northern Receiving Station and the PG&E Los Esteros Substation. This new line will not connect directly into the Los Esteros Substation, but will connect to the new SVP 230 kV Switching Station. SVP will connect its 230 kV buses to thePG&E Los Esteros Substation 230 kV buses, separated by new breakers. These breakers and the bus connection require a 60x400 foot expansion of the PG&E Los Esteros Substation fenceline southward into the SVP site (PG&E, 2004a, pp. 1-3,

and 12). This new PG&E-SVP 230 kV interconnection provides a termination point for the 320 MW output of the Phase 2 combined-cycle project. This transmission interconnection is the preferred permanent termination for the 230 kV output of the proposed 320 MW LECEF Phase 2 combined-cycle plant.

Phase 1 Alternate Interconnection

In addition to connecting the Phase 2 combined-cycle output of the LECEF to SVP, the Updated Final System Impact Study (PG&E, 2004b, pp. 2, and 19) also analyzes the impacts of permanently connecting the Phase 1 simple-cycle 180 MW power output to the new SVP Switching Station.

This interconnection of the Phase 1 output would involve adding the 115/230 kV LECEF transformers (**Project Description Figure 3**), and making the identical connections described above for Phase 2, and converting the simple-cycle output to 230 kV from its current 115 kV. Under this option, the addition of the new 115/230 kV transformers and interconnection of LECEF to the SVP Switching Station, could occur earlier and independently from the Phase 2 combined-cycle conversion. This interconnection would be required prior to synchronizing any of the converted combined-cycle power trains to the SVP grid, and is a practical first step in the phased conversion process. The applicant is requesting Energy Commission approval to modify the Phase 1 termination accordingly.

REFERENCES

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. Publication Number: P800-02-005, July 2, 2002.

CEC (California Energy Commission) 2004a. Commission Order Approving Project Modification: Approving a Shorter Temporary Transmission Tap Line (Order No 04-0121-06). January 21, 2004.

CEC (California Energy Commission) 2004b. Final Staff Assessment for Los Esteros Critical Energy Facility Phase 1 (03-AFC-2). November 15, 2004.

CEC (California Energy Commission) 2005. Los Esteros Critical Energy Facility II, Phase 1 (03-AFC-2). Energy Commission Final Decision. Publication Number: P800-2005-002-CMF. March 16, 2005.

City of San Jose 2001. City Council Ordinance #26343, Specific Zoning PDSCH # 00-06-048. April 3, 2001.

City of San Jose 2002. City Council Ordinance #26579, Specific Zoning PDSCH # 01-09-088. March 5, 2002.

De Young, S. 2005. Email to Robert Worl (California Energy Commission) regarding scheduled coordination with the City of San Jose. April 14, 2005.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2), Volumes I and II. December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004c. Response to Soils and Water Resources Compliance Data Requests (01-AFC-12c). May 6, 2004.

PG&E (Pacific Gas and Electric) 2004a. System Impact Study and Facilities Study Report: Silicon Valley Power/Calpine 230 kV Switching Station and LECEF Interconnection into PG&E's Los Esteros Substation (Updated Draft). July 6, 2004.

PG&E (Pacific Gas and Electric) 2004b. System Impact Study and Facilities Study Report: Silicon Valley Power/Calpine 230 kV Switching Station and LECEF Interconnection into PG&E's Los Esteros Substation (Updated Final Report). December 2, 2004.

Tetzloff, R. 2004. Email response to Robert Worl (California Energy Commission) regarding construction scenarios for a conversion to a combined-cycle facility at LECEF. December 3, 2004.

Shipes, R. 2004. Deputy Director, Environmental Services Department, City of San Jose. Telephone conversation with Lorraine White (California Energy Commission) regarding LECEF waste water discharge. May 28, 2004.

PROJECT DESCRIPTION - FIGURE 1

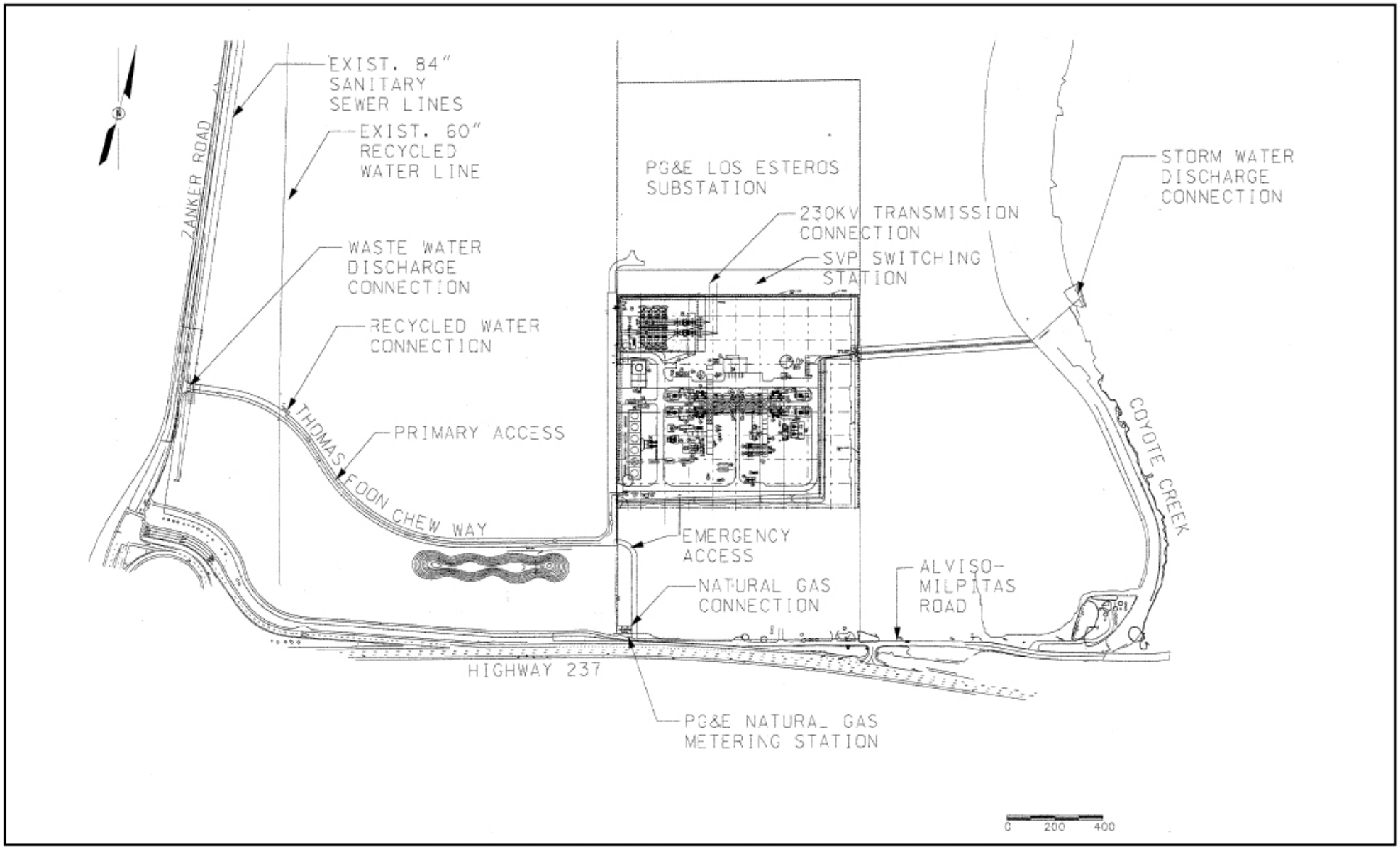
Los Esteros Critical Energy Facility II - Phase 2 - Simulation: Completed Combined-Cycle Facility

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: LECEF LLC

PROJECT DESCRIPTION - FIGURE 2

Los Esteros Critical Energy Facility II - Phase 2 - Site Plan

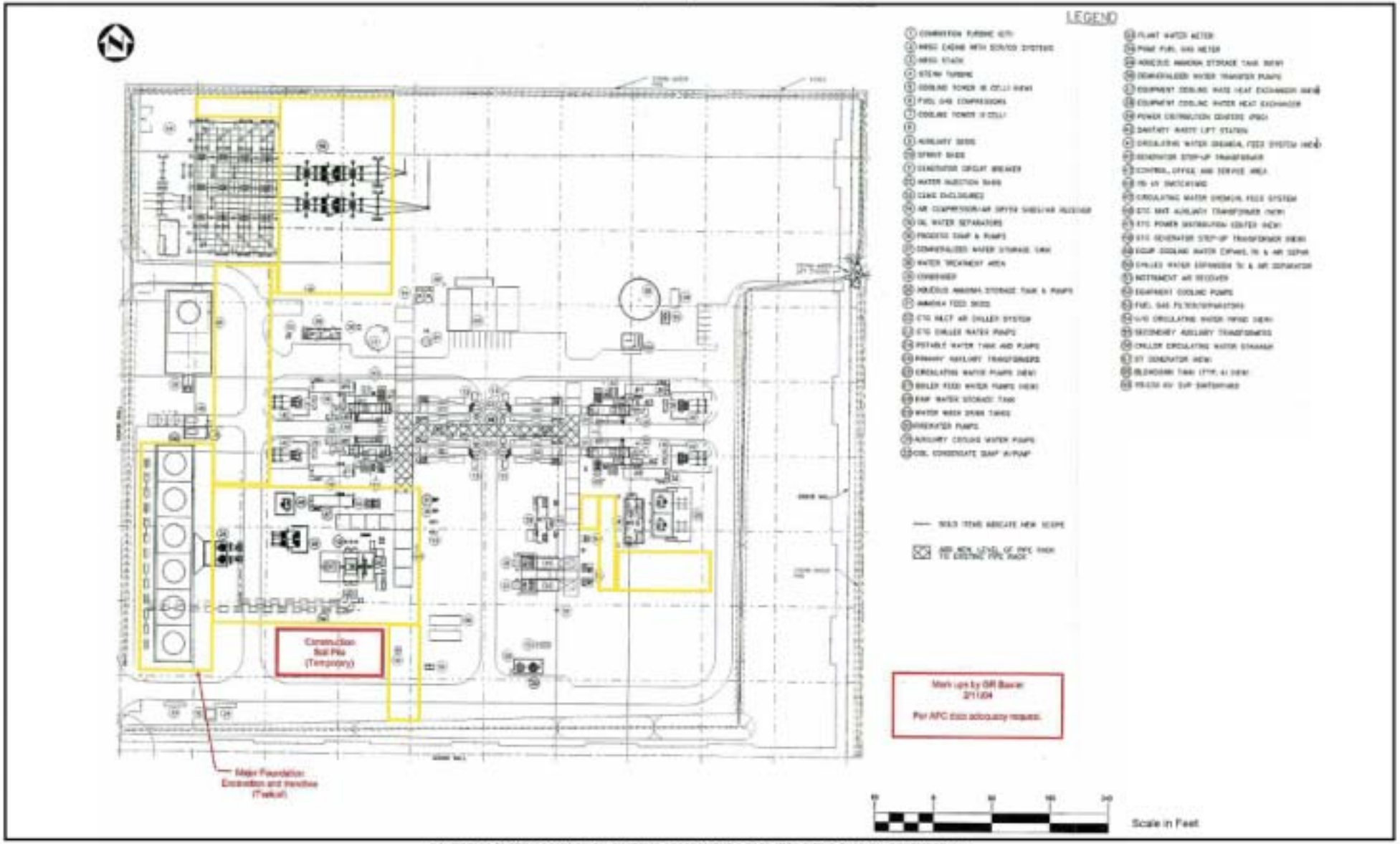


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC Figure 2.4-1

PROJECT DESCRIPTION - FIGURE 3

Los Esteros Critical Energy Facility II - Phase 2 - General Arrangement



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC 6.11.01

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

Testimony of Gabriel D. Taylor

INTRODUCTION

This section of the Final Staff Assessment (FSA) evaluates the expected air quality impacts from the emissions of criteria air pollutants due to the construction and operation of the proposed Los Esteros Critical Energy Facility Phase 2 (LECEF Phase 2) modification, located in the city of San Jose, California. This FSA is based on the Bay Area Air Quality Management District (District) March 14, 2005 Revised Preliminary Determination of Compliance (RPDOC), however, and staff will likely publish an FSA addendum after the District issues a Final Determination of Compliance (FDOC), expected in May, 2005.

Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), precursor organic compounds (POC), particulate matter less than 10 microns in diameter (PM10) and particulate matter less than 2.5 microns in diameter (PM2.5).

In this analysis the staff evaluated the following major points:

1. Whether the project is likely to conform with applicable Federal, State and Bay Area Air Quality Management District (District or BAAQMD) air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b);

2. Whether the project is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and

3. Whether the mitigation proposed for the project is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1742.5.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (42 U.S.C. §7401 et seq.), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards.

The NSR analysis has been delegated by the United States Environmental Protection Agency (U.S. EPA) to the District. The U.S. EPA determines conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant. LECEF Phase 2 will not be subject to PSD requirements because the facility does not emit more than 100 tons per year of any singular criteria pollutant.

STATE

The federal Clean Air Act is implemented by the California Air Resources Board (ARB) and a number of local air districts. ARB also adopts state standards for criteria pollutant impacts that are often more stringent than those adopted by the federal EPA. These state requirements, like the federal ones, are in turn enforced by the local air districts. These air districts issue air permits for most stationary sources, enforce state and federal law, and monitor sources for permit compliance. When power plants are licensed by the Energy Commission, the air district permit is incorporated as part of that license, thus capturing the conditions the local air district would otherwise have required for compliance with state and federal law.

LOCAL

The project is subject to all applicable District rules and regulations, briefly described below:

Regulation 2

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

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

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

Emission reductions of nitrogen oxides and/or sulfur dioxide may be used to offset increased emissions of PM10 at offset ratios deemed appropriate by the Air Pollution Control Officer. A facility that emits less than 100 tons of any pollutant may voluntarily

provide emission offsets for all, or any portion, of their PM10 or sulfur dioxide emissions increase at the offset ratio required above (1.0:1.0).

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

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

Regulation 6

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

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

Regulation 9

Rule 1 - Limitations

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

Rule 9 - Nitrogen Oxides from Stationary Gas Turbines. This rule limits gaseous fired, selective catalytic reduction (SCR) equipped, combustion turbines rated greater than 10 MW to 9 ppm @ 15 percent O_2.

Regulation 10

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

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

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

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

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

Specific local meteorological data was collected at the San Jose Airport monitoring station, located just southeast of the project site. The data sets from 1992-1995 and 1997 were proposed for use by the applicant and approved by the District. These data sets include hourly measurements of ambient temperature, Pasquill air stability class, wind speed and wind direction. Monthly wind roses, which are graphical representations showing wind speeds and directions based on the collected data from all four years, are shown in Appendix A. The local winds blow almost solely from the northwest during the spring, summer and fall seasons, but shift in the winter to blow mostly from the southeast.

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

EXISTING AIR QUALITY

The U.S. EPA and the California Air Resource Board (ARB) have both established allowable maximum ambient concentrations of air pollutants based on public health impacts, called ambient air quality standards (AAQS). The state AAQS, established by

ARB, are typically lower (more stringent) than the federal AAQS, established by the U.S. EPA. The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated, the averaging times for the various air quality standards (the duration over which all measurements taken are averaged) range from one hour to one year (annual). The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (10^{-3} g, 0.001 g, or mg) or micrograms (10^{-6} g, 0.000001 g, or μg) of pollutant in a cubic meter (m^3) of air, averaged over the applicable time period.

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m^3)	0.12 ppm (235 μg/m^3)
	8 Hour	-	0.084 ppm
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.25 ppm (470 μg/m^3)	-
	Annual Average	-	0.053 ppm (100 μg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 μg/m^3)	-
	3 Hour	-	0.5 ppm (1300 μg/m^3)
	24 Hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)
	Annual Average	-	0.03 ppm (80 μg/m^3)
Respirable Particulate Matter (PM10)	24 Hour	50 μg/m^3	150 μg/m^3
	Annual Arithmetic Mean	20 μg/m^3	50 μg/m^3
Fine Particulate Matter (PM2.5)	24 Hour	-	65 μg/m^3
	Annual Arithmetic Mean	12 μg/m^3	15 μg/m^3
Sulfates	24 Hour	25 μg/m^3	-
Lead	30 Day Average	1.5 μg/m^3	-
	Calendar Quarter		1.5 μg/m^3
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm (42 μg/m^3)	-
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 μg/m^3)	-
Visibility Reducing Particulates	8 hours	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.	-

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

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

Los Esteros Critical Energy Facility is located in the city of San Jose within the Bay Area Air Basin and is under the jurisdiction of the BAAQMD. All state and federal ambient air quality designations are presented in AIR QUALITY Table 2. Note that the region is classified as nonattainment for both the State PM10 and State ozone AAQS.

AIR QUALITY Table 2
Local Air Quality Classifications

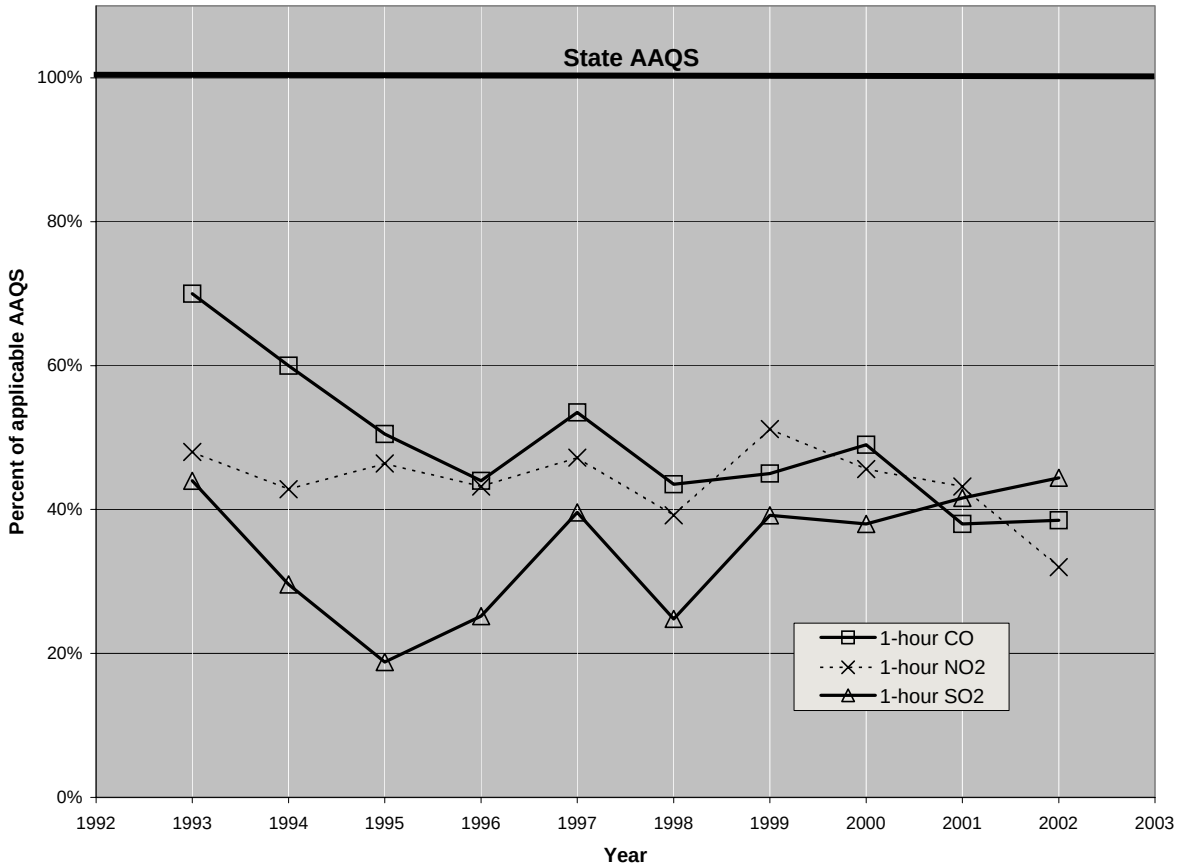
Pollutant	Averaging Time	State Designation	Federal Designation
Carbon Monoxide (CO)	1 hour	Attainment	Attainment
	8 hour	Attainment	Attainment
Nitrogen Dioxide (NO_2)	1 hour	Attainment	--
	Annual	--	Attainment
Particulate Matter (PM10)	24 hour	**Nonattainment**	Unclassified
	Annual	**Nonattainment**	Attainment
Fine Particulate Matter (PM2.5)	24 hour	**Nonattainment**	Unclassified
	Annual	--	Unclassified
Sulfur Dioxide (SO_2)	1 hour	Attainment	--
	24 hour	Attainment	Attainment
	Annual	--	Attainment
Ozone	1 hour	**Nonattainment**	**Nonattainment**
	8 hour	--	Unclassified

Ambient air quality data has been collected extensively in the Bay Area Air Basin. CO, NO_2 and SO_2 are all classified as attainment with both the State and Federal AAQS. AIR QUALITY Table 3 and AIR QUALITY Figure 1 below shows the maximum ambient concentrations of these three attainment pollutants measured by the District over the past decade. The data demonstrates that the region has not experienced any recent violations of the NO_2, CO or SO_2 standards.

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

Pollutant	Averaging Time	1994	1995	1996	1997	1998	1999	2000	2001	2002	Limiting AAQS
CO	8-hour	8.75	5.84	7	6.11	6.27	6.28	7.03	5.09	5.13	**9**
	1 hour	12	10.1	8.8	10.7	8.7	9	9.8	7.6	7.7	**20**
NO_2	Annual	0.028	0.027	0.025	0.025	0.025	0.026	0.025	0.024	0.019	**0.053**
	1 hour	0.107	0.116	0.108	0.118	0.098	0.128	0.114	0.108	0.08	**0.25**
SO_2	24-hour	0.0123	0.0117	0.0144	0.0141	0.0159	0.0382	0.0340	0.0171	0.016	**0.04**
	1 hour	0.074	0.047	0.063	0.099	0.062	0.098	0.095	0.104	0.111	**0.25**
Source: California Air Resources Board											

AIR QUALITY Figure 1
BAAQMD Attainment Pollutant
Maximum 1-hour Average Concentrations (percent of AAQS)



The following is a more detailed description of these three pollutants.

Carbon Monoxide (CO)

CO is generated from most combustion engines and other combustion activities. CO is considered a local pollutant, as it will rapidly oxidize according to the following reaction:

$2CO + O_2 \rightarrow 2CO_2$

It is thus found in high concentrations only near the source of emissions. Automobiles and mobile sources are the principal source of CO emissions. High levels of CO emissions can also be generated from fireplaces and wood-burning stoves. Industrial sources, including power plants, typically constitute less than 10 percent of the ambient CO levels in the Bay Area.

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Because the mobile sector (cars, trucks, busses and other vehicles) is the main source of CO, ambient concentrations of CO are highly dependent on emissions from the mobile sector. In fact, the peak CO concentrations occur during rush-hour traffic in the morning and afternoon. Carbon monoxide concentrations in the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all the counties in California, with the sole exception of Los Angeles County, are in compliance with the state CO AAQS.

Nitrogen Dioxide (NO_2)

Most combustion activities and engines emit significant quantities of nitrogen oxides (NO_x), a term used in reference to combined quantities of nitrogen oxide (NO) and NO_2. Approximately 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO_2. Though only NO_2 is a criteria pollutant, NO is readily oxidized in the atmosphere into NO_2. The formation of NO_2 occurs in the presence of sunlight with the help of ozone according to the following reaction:

$$NO + O_3 \leftrightarrow NO_2 + O_2$$

In urban areas, the ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO_x. This reaction explains why, in urban areas, ozone concentrations at ground level can be relatively low, while downwind rural areas (without sources of fresh NO emissions) are exposed to relatively high ozone concentrations as the reaction proceeds in reverse in the presence of sunlight.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur and in significant ambient quantities can lead to acid rain and environmental damage. Natural gas contains very little sulfur and consequently results in very little SO_2 emissions when combusted. By contrast, fuels high in sulfur, such as lignite (a type of coal), emit large amounts of SO_2 when combusted. Sources of SO_2 emissions within the Bay Area Air Basin come from every economic sector and include a wide variety of gaseous, liquid and solid fuels.

The following sections discuss the specific ambient air conditions regarding PM2.5 and the two nonattainment criteria pollutants, PM10 and Ozone.

Respirable Particulate Matter (PM10)

PM10 can be emitted directly from a combustion process or it can be formed many miles downwind when various precursor pollutants chemically interact in the atmosphere. Gaseous emissions of pollutants such as NO_x, SO_2 and Precursor Organic Compounds (POC) from turbines, and ammonia (NH_3) from NO_x control equipment can, given the right meteorological conditions, form particulate nitrates, sulfates, and organic solids. These pollutants are known as secondary particulates, because they are not directly emitted, but rather are formed outside the facility through chemical reactions in the atmosphere.

The District has recorded violations of the state 24-hour PM10 AAQS in the Bay Area Air Basin in all recent years. AIR QUALITY Table 4 shows this data for a representative selection of five of the counties in the District, for four of the monitoring stations located in Santa Clara County, and the basin wide maximum values. The data shows that the PM10 problem is generally more significant towards the south and east regions of the basin. AIR QUALITY Figure 1 below refines this data to show a comparison between the maximum recorded ambient 24-hour average concentrations over the past nine years in the Santa Clara County and in the Bay Area Air Basin as a whole. As can be seen, the ambient PM10 levels in Santa Clara County tend to be the highest in the basin, and violations have been recorded in all recent years.

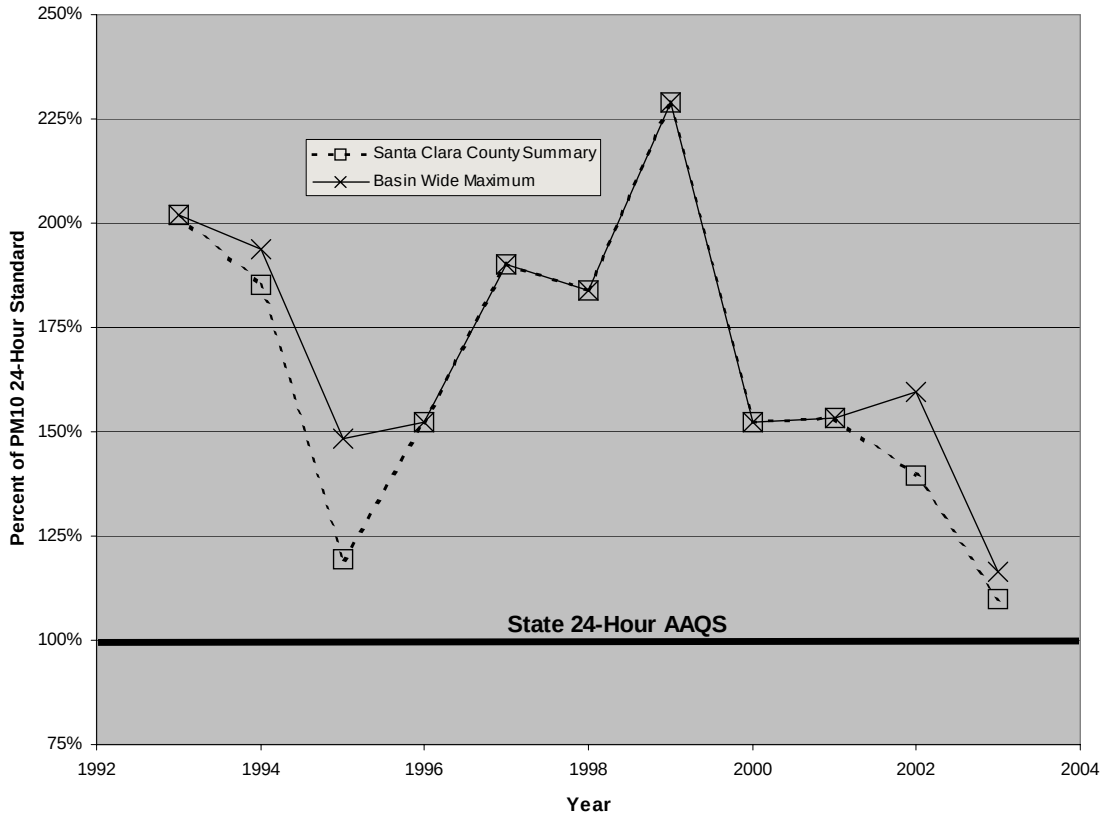
AIR QUALITY Table 4
BAAQMD PM10 Maximum 24-hour Average Concentrations and Number of Measurement Periods (6-day periods) In Violation of the State AAQS*

Station	PM10	1996	1997	1998	1999	2000	2001	2002	2003
Marin County Summary	24-Hour High Avg. ($\mu g/m^3$)	50.3	72	52.4	75.6	39.5	78.8	69.6	39.1
	State Violations	0	2	1	2	0	2	3	0
SF County Summary	24-Hour High Avg. ($\mu g/m^3$)	70.9	81	52.4	77.9	63.2	67.4	74.1	50.8
	State Violations	2	3	1	6	2	7	4	1
Alameda County Summary	24-Hour High Avg. ($\mu g/m^3$)	71.1	64.7	62.7	87.9	71.2	108.9	63.5	37.4
	State Violations	1	2	2	3	2	3	2	0
Contra Costa County Summary	24-Hour High Avg. ($\mu g/m^3$)	75.6	77.8	66.8	100.6	62.0	105.8	73.2	58.3
	State Violations	1	2	2	6	1	3	3	1
Santa Clara County Summary	24-Hour High Avg. ($\mu g/m^3$)	76.1	95	92	114.4	76.1	76.7	69.7	56.8
	State Violations	2	3	3	5	7	4	4	3
San Jose 4th Street	24-Hour High Avg. ($\mu g/m^3$)	76.1	78	92	114.4	76.1	76.7	45	-
	State Violations	2	3	3	5	7	4	0	-
San Jose Tully Road	24-Hour High Avg. ($\mu g/m^3$)	66.8	95	88.5	96.5	68.5	75.1	69.7	55.0
	State Violations	1	3	1	4	2	4	4	2
Basin Wide Summary**	24-Hour High Avg. ($\mu g/m^3$)	76.1	95	92	114.4	76.1	108.9	79.8	58.3
	State Violations	2	3	3	6	7	8	4	3

* State 24-Hour Ambient Air Quality Standard for PM10: 50 $\mu g/m^3$
Federal 24-Hour Ambient Air Quality Standard for PM10: 150 $\mu g/m^3$
** The BAAQMD encompasses all of seven counties - Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara and Napa, and portions of two others - southwestern Solano and southern Sonoma.

Source: California Air Resources Board & Bay Area Air Quality Management District

AIR QUALITY Figure 2
Maximum 24-hour Average PM10 Concentrations
in Santa Clara County and BAAQMD



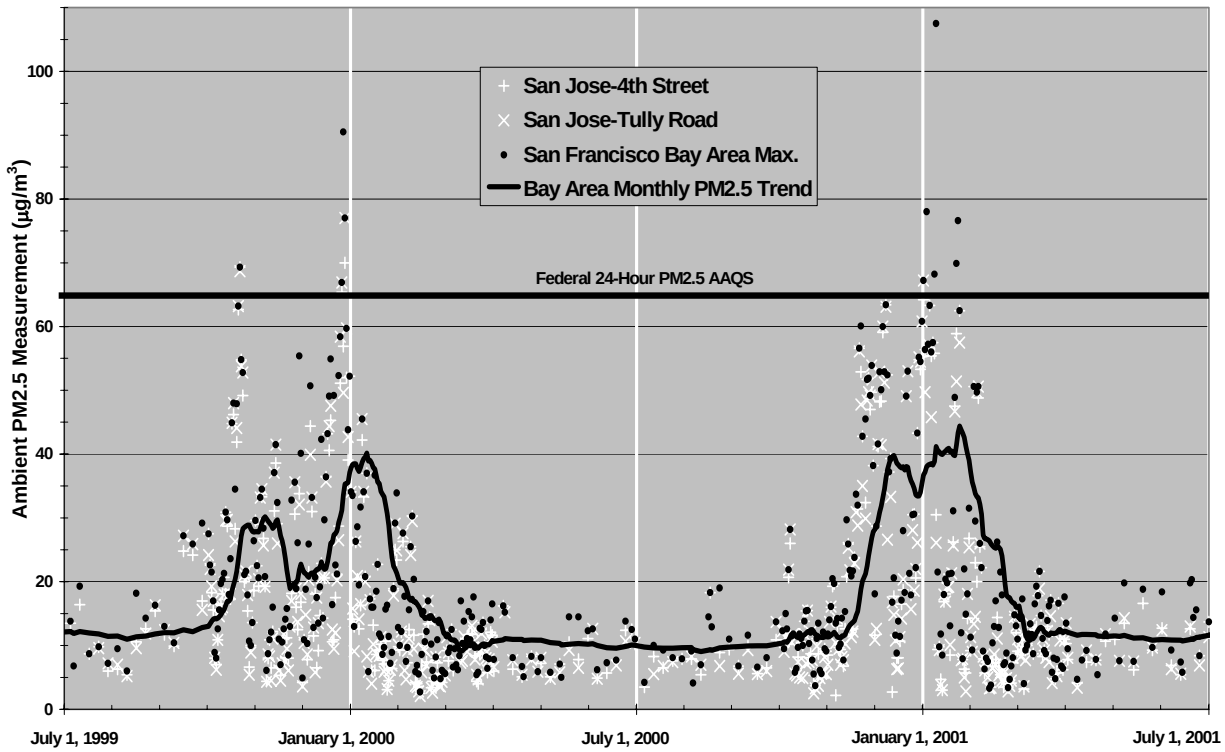
Fine Particulate Matter (PM2.5)

Fine particulate matter, or particulate matter less than 2.5 microns in diameter, is a subset of PM10 and is generated mainly from the combustion of materials and from precursor gases (SO_x, NO_x, and POC) through photo-chemical reactions in the atmosphere. PM2.5 consists predominantly of sulfates, nitrates, ammonium, elemental carbon, and organic solids.

The U.S. EPA has promulgated a 65 $\mu g/m^3$ 24-hour average, and a 15 $\mu g/m^3$ annual average PM2.5 standard, and on December 17, 2004 released final area designations classifying the BAAQMD as attainment for both federal standards. ARB however has adopted an annual average PM2.5 standard of 12 $\mu g/m^3$, and designated the Bay Area Air Basin as nonattainment for that standard.

Presented in AIR QUALITY Figure 3 is PM2.5 data collected at the San Jose 4th Street and San Jose Tully Road monitoring stations, the two monitoring stations closest to the project site, as well as the Bay Area Maximum values, from summer 1999 through summer 2001. This data indicates that the highest PM2.5 concentrations normally occur during the winter months (November through January).

AIR QUALITY Figure 3
Bay Area and San Jose PM2.5 Ambient Trend (1999-2001)



Ozone (O_3)

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

In the Bay Area Air Basin, the maximum ambient ozone levels generally increase from west to east since the air coming onshore from the Pacific is generally clean. As air flows over regions of human activity, it accumulates pollutants. As the pollutants warm up, the chemical reactions that generate ozone accelerate and the ambient ozone levels increase. This atmospheric chemistry takes time to proceed, however, so the secondary ozone impacts from NO_x and POC emissions are generally miles down wind, to the south and east in the Bay Area Air Basin.

AIR QUALITY Table 5
Maximum Concentration of O_3 (Ozone) and
Number of Days in Violation of the State Ozone AAQS*

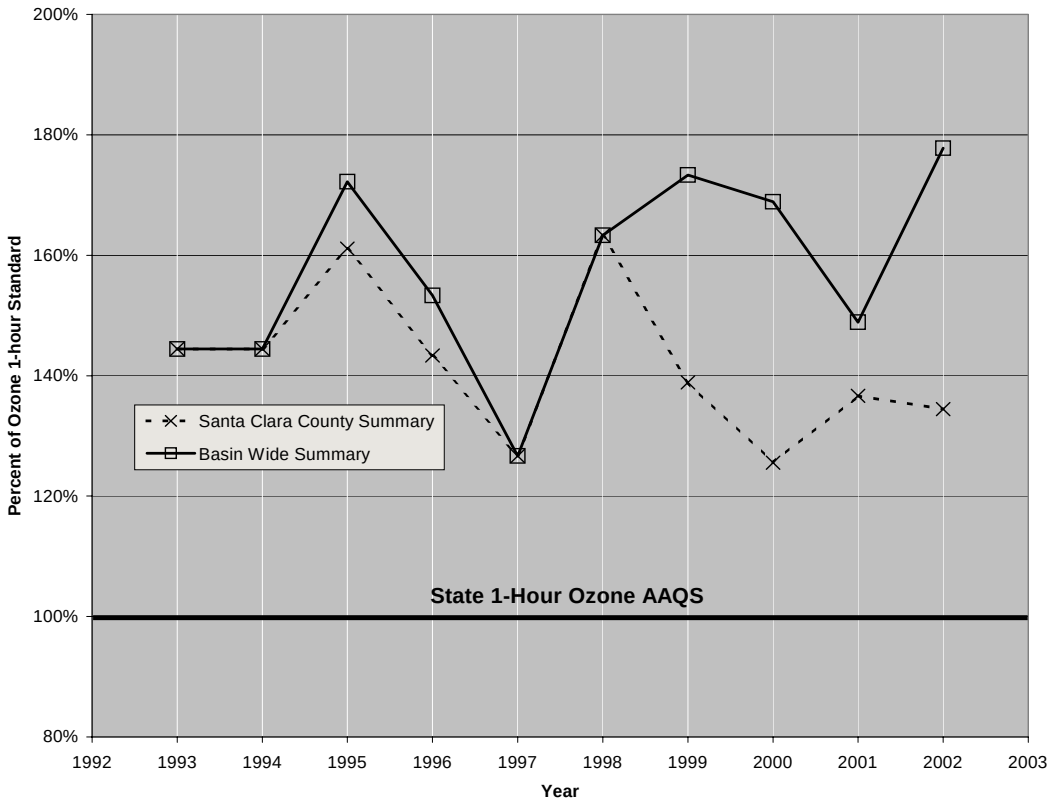
Station	Ozone	1995	1996	1997	1998	1999	2000	2001	2002
Marin County Summary	Highest 1 hour Average (ppm)	0.088	0.105	0.106	0.074	0.102	0.071	0.087	0.077
	State Violations	0	2	1	0	2	0	0	0
SF County Summary	Highest 1 hour Average (ppm)	0.088	0.071	0.068	0.053	0.079	0.058	0.082	0.054
	State Violations	0	0	0	0	0	0	0	0
Alameda County Summary	Highest 1 hour Average (ppm)	0.155	0.138	0.114	0.146	0.146	0.152	0.113	0.160
	State Violations	21	23	6	22	15	9	9	11
Contra Costa Co. Summary	Highest 1 hour Average (ppm)	0.152	0.137	0.108	0.147	0.156	0.138	0.134	0.111
	State Violations	12	15	4	16	8	2	7	10
Santa Clara County Summary	Highest 1 hour Average (ppm)	0.145	0.129	0.114	0.147	0.125	0.113	0.123	0.121
	State Violations	22	24	3	22	12	4	9	10
Gilroy 9th Street	Highest 1 hour Average (ppm)	0.13	0.121	0.095	0.135	0.105	-	0.123	0.121
	State Violations	10	15	1	10	3	-	3	6
Los Gatos	Highest 1 hour Average (ppm)	0.141	0.129	0.097	0.133	0.117	0.080	0.118	0.113
	State Violations	13	10	1	5	4	0	2	4
Mountain View	Highest 1 hour Average (ppm)	0.116	0.106	0.114	0.097	0.114	NA	-	-
	State Violations	2	3	1	2	7	NA	-	-
San Jose 4th Street	Highest 1 hour Average (ppm)	0.134	0.11	0.094	0.147	0.109	0.073	0.105	0.065
	State Violations	14	5	0	4	3	0	2	0
San Jose Piedmont Road	Highest 1 hour Average (ppm)	0.145	0.118	0.095	0.129	0.116	0.096	0.091	0.090
	State Violations	15	5	1	5	2	1	0	0
San Martin	Highest 1 hour Average (ppm)	0.128	0.115	0.091	0.144	0.125	0.113	0.117	0.119
	State Violations	14	18	0	15	7	4	7	8
Basin Wide Summary**	Highest 1 hour Average (ppm)	0.155	0.138	0.114	0.147	0.156	0.152	0.134	0.160
	State Violations	28	34	8	29	20	12	15	16

* State 1 hour Ambient Air Quality Standard for Ozone: 0.09 ppm (180 $\mu g/m^3$)
Federal 1 hour Ambient Air Quality Standard for Ozone: 0.12 ppm (235 $\mu g/m^3$)
** The BAAQMD encompasses all of seven counties - Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara and Napa, and portions of two others - southwestern Solano and southern Sonoma.
NA = Ozone data is not available for these years at these sites.

Source: California Air Resources Board & Bay Area Air Quality Management District

As can be seen from AIR QUALITY Table 5 above and AIR QUALITY Figure 4 below, the ambient ozone levels in the region have consistently violated the state AAQS. AIR QUALITY Figure 4 also demonstrates that there is no convincing evidence of either improvement or degradation of the ambient ozone condition in the basin.

AIR QUALITY Figure 4
Maximum 1-Hour Average Ozone Concentrations in Santa Clara County and BAAQMD



PROJECT DESCRIPTION AND EMISSIONS

The existing Los Esteros Critical Energy Facility includes the following major components:

- Four General Electric LM6000PC Sprint combustion gas turbines (48.7 MW each). The Sprint system is a duel pressure water mist injection system for power augmentation.
- Oxidation catalysts (OC) and selective catalytic reduction (SCR) equipment, installed within four heat recovery steam generator (HRSG) casings and stacks. These HRSG casings were installed during the original construction in anticipation of a later conversion to combined cycle (LECEF 2003, p. 1-2).
- A single cell, plume abated, cooling tower

The proposed Phase 2 combined cycle conversion would add the following major components:

- Four 139 MMBtu/hr HHV Duct Burners (one in each HRSG)
- A single 140 MW nominal steam turbine generator (STG)
- A six cell, plume abated, cooling tower

CONSTRUCTION

Facility construction is expected to take about 19 months. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, when work such as grading, site preparation, foundations, underground utility installation and building erection occurs. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the steam turbine, the heat recovery steam generators, condenser, pumps, piping and valves. Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Lastly, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and is a relatively small source of emissions in comparison to the early construction activities.

The construction of these facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions from construction equipment and vehicles. The projected maximum daily and annual emissions, based on the highest monthly emissions over the entire construction period, are shown in AIR QUALITY Table 6.

AIR QUALITY Table 6
Estimated Maximum Construction Emissions

	NO_x	CO	POC	PM10	SO_2
Maximum Daily Emissions (lb/day)	106.1	311.9	29.4	29.8	1.5
Maximum Annual Emissions (tons/year)	6.3	18.1	1.8	2.9	0.04

Source: LECEF 2003, Appendix 8.1-D2.4.1

The largest percentage of the total construction emissions from AIR QUALITY Table 6 will likely be emitted during the first phase of project site activity, mostly due to earth moving, grading activities and large equipment operations.

INITIAL COMMISSIONING

New power generation facilities must go through an initial firing and commissioning phase before going fully on line. During this period, emissions may exceed permitted levels due to startups, shutdowns, periods of low load operation and testing before the low-NO_x burners and SCR systems are fine tuned for optimum performance.

The applicant identified four commissioning scenarios during which emissions may exceed normal steady state operations emissions (LECEF 2003, p. 8.1-45 & Appendix Table 8.1-B2-8); however, emissions estimates for all four scenarios are predicted to be

lower than the emissions estimated from a facility startup (Table 8.1-37). Since emissions of PM10 and SO_2 are proportional to fuel use, and fuel use (and thus PM10 and SO_2 emissions) is much lower during commissioning then during steady state operations, only NO_x, CO and POC emissions estimates are presented in AIR QUALITY Table 7 below.

AIR QUALITY Table 7
Estimated Maximum Initial Commissioning Emissions

	NO_x	CO	POC
Maximum Hourly Emissions (lb/hour)	36.40	26.46	7.56

Source: LECEF 2003, Appendix Table 8.1-B2-8

OPERATION

Emission Controls

NO_x Controls

The combustion turbines will be equipped with water injection to minimize NO_x generation and the CTG exhaust will be further treated by an SCR system before release to the atmosphere. Selective catalytic reduction refers to a process that chemically reduces NO_x to elemental nitrogen and water vapor by injecting ammonia into the flue gas stream in the presence of a catalyst and excess oxygen. The process is termed selective because the ammonia preferentially reacts with NO_x rather than oxygen. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Regardless of the type of catalyst used, efficient conversion of NO_x to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream and a catalyst surface large enough to ensure sufficient time for the reaction to take place.

POC and CO Controls

POC and CO will be controlled at the CTG combustor and by an oxidation catalyst. An oxidation catalyst system chemically reacts organic compounds and CO with excess oxygen to form nontoxic carbon dioxide and water. Unlike the SCR system for reducing NO_x, an oxidation catalyst does not require any additional chemicals.

PM10 and SO_2 Controls

The exclusive use of natural gas, an inherently clean fuel that contains very little noncombustible solid residue, will limit the formation of SO_2 and PM10. Natural gas does contain small amounts of a sulfur-based scenting compound known as mercaptan, which when combusted, results in sulfur dioxide emissions. However, in comparison to other fuels used in modern thermal power plants, such as fuel oil or coal, the sulfur dioxide produced from the combustion of natural gas is very low. Like SO_2, the emissions of PM10 from natural gas combustion are also very low compared to the combustion of fuel oil or coal. It is assumed in these calculations that the natural gas has a maximum short term sulfur content of 1.0 gr/100scf (based on California Public Utility Commission requirements for pipeline quality natural gas), and an annual average sulfur content of 0.33 gr/100scf (based on gas sampling).

The majority of the emissions from cooling towers is pure water vapor; however, a small amount of liquid water escapes and is known as "drift". Cooling tower drift consists of small water droplets, which can generate particulate matter that originates from the dissolved solids in the circulating water. To limit these particulate emissions, drift eliminators are installed in the cooling tower to capture these water droplets. The applicant intends to use drift eliminators on the cooling towers designed to limit drift to 0.0005 percent of the circulating water volume per unit time.

Best Available Control Technology (BACT)

The District determined that the Phase 2 project triggers BACT for NO_2, CO, POC, PM10 and SO_2. AIR QUALITY Table 8 presents the BACT levels as presented in the District RPDOC.

AIR QUALITY Table 8
BAAQMD BACT Determination Levels (@ 15% O_2)

Emissions Source	Pollutant	BACT	Averaging Time
CTG/HRSG	NO_x	2.0 ppm	1-hour
CTG/HRSG	CO	9.0 ppm	3-hour rolling
CTG/HRSG	CO	4.0 ppm	8,760-hour rolling
CTG/HRSG	POC	2.0 ppm	Annual Testing
CTG/HRSG	PM10	Fuel sulfur ≤1.0 gr/100 scf	Quarterly Sampling
Cooling Towers	PM10	0.0005% drift guarantee	-
CTG/HRSG	SO_2	Fuel Sulfur ≤ 1.0 gr/100 scf	Quarterly Sampling

Source: BAAQMD 2005a

The District proposes a short term CO limit of 9.0 ppm (3-hour rolling average), and a long term CO limit of 4.0 ppm (8,760-hour rolling average). This annual average concentration limit would yield a maximum mass emissions of 98.6 tons per year of CO, which is lower than the federal Prevention of Significant Deterioration (PSD) trigger of 100 tons per year.

Project Operating Emissions

Per the applicant's request, all emissions calculations and limitations are based on an assumed availability of 100 percent (8760 hours per year operation). These total hours are divided into an assumed 7510 hours per year of operation without duct firing, and the remaining 1250 hours per year with duct firing. The CTGs and duct burners will burn only pipeline natural gas; there are no provisions for an alternative or back-up fuel.

The proposed equipment’s maximum criteria air pollutant emissions are based on source testing, vendor data for other GE LM6000 turbines in a similar configuration and the District BACT levels (BAAQMD 2005a). AIR QUALITY Table 9 below lists the maximum 1-hour emissions from each piece of equipment on the proposed project site.

AIR QUALITY Table 9
Equipment Maximum Short-Term Emissions Rates
(pounds per hour [lb/hr])

Equipment	NO_x	CO	POC	PM10	SO_2
CTG Startup	40	41	12	2.50	1.40
CTG Steady State	3.62	9.91	1.26	2.50	1.40
Duct Burner	1.01	2.75	0.35	-	0.39
Fire Pump Engine Test (45 minutes)	3.21	0.12	0.03	0.03	0.07
1-Cell Cooling Tower	-	-	-	0.35	-
6-Cell Cooling Tower	-	-	-	1.83	-

Source: Energy Commission staff calculations

Based on these emissions rates, the maximum possible 1-hour emissions from the entire facility would occur when all four turbines start concurrently. AIR QUALITY Table 10 below presents this scenario as the facility wide maximum potential short term emissions. AIR QUALITY Table 11 presents the more common maximum steady state emissions scenario.

AIR QUALITY Table 10
Facility Maximum 1-hour Startup Emissions
(pounds per hour [lb/hr])

Equipment Description	NO_x	CO	POC	PM10	SO_2
4 CTG Starts	160	164	48	10.00	5.59
1-Cell Cooling Tower	-	-	-	0.35	-
Total Maximum Startup Emissions	**160**	**164**	**48**	**10.35**	**5.59**

Source: Energy Commission staff calculations and BAAQMD 2005a

AIR QUALITY Table 11
Facility Maximum 1-hour Steady State Emissions
(pounds per hour [lb/hr])

Equipment Description	NO_x	CO	POC	PM10	SO_2
4 CTGs Steady State	14.46	39.62	5.04	10.00	5.59
4 Duct Burners	4.02	11.02	1.40	-	1.55
Fire Pump Engine Test (45 minutes)	3.21	0.12	0.03	0.03	0.07
1-Cell Cooling Tower	-	-	-	0.35	-
6-Cell Cooling Tower	-	-	-	1.83	-
Total Maximum Steady State Emissions	**21.70**	**50.76**	**6.47**	**12.21**	**7.21**

Source: Energy Commission staff calculations and BAAQMD 2005a

In general, higher emissions of NO_x, POC and CO will occur during the startup and shutdown of a large CTG because the turbine combustors are designed for maximum efficiency during full load, steady state operation. During startup, combustion temperatures and pressures change rapidly, resulting in less efficient combustion and higher emissions. Also, flue gas emission controls (the catalysts discussed above), operate most efficiently when a turbine operates at or near full load temperatures.

The maximum daily emissions rates for NO_x, CO, POC, PM10 and SO_2 were conservatively estimated for each power train based on 20 hours of operation with four hours of startup, in addition to 20 hours of duct burner operation. The total project maximum daily emissions are then conservatively estimated as the sum of the emissions from all four power trains. These estimates are presented in AIR QUALITY Table 12.

AIR QUALITY Table 12
Project Maximum Daily Emissions
(pounds per day [lb/day])

Equipment Description	NO_x	CO	POC	PM10	SO_2
4 CTG Starts (4 hours each)	640	656	192	40	22.34
80 hours (20 x 4) CTG Steady State	289.24	792.47	100.86	200.00	111.71
80 hours (20 x 4) Duct Burner	80.41	220.31	28.04	-	31.05
Fire Pump Engine Test (45 minutes)	3.21	0.12	0.03	0.03	0.07
24 hours 1-cell Cooling Tower	-	-	-	8.50	-
24 hours 6-cell Cooling Tower	-	-	-	43.84	-
Total Maximum Daily Emissions	**1013**	**1669**	**321**	**292**	**165.2**

Source: Energy Commission Staff calculations and BAAQMD 2005a

The expected maximum annual emissions from each turbine is summarized in AIR QUALITY Table 13, and the total facility expected maximum annual emissions is summarized in AIR QUALITY Table 14 compared to the RPDOC annual emissions limits. The calculations assumes 100 percent availability, 250 hours of startup, 1250 hours of duct burner operation per turbine train, and 100 hours of fire pump testing per year.

AIR QUALITY Table 13
Turbine Maximum Annual Emissions
(pounds per year [lb/yr])

Process Description	NO_x	CO	POC	PM10	SO_2
250 Startup hours	10,000	10,250	3,000	625.0	115.20
8510 hours Steady State	30,768.13	37,466.16	10,729.29	21,275.0	3,921.33
1250 hours Duct Burners	1,256.40	1,529.90	438.12	-	160.12
Total Maximum per Turbine	**42,025**	**49,246**	**14,167**	**21,900.0**	**4,196.66**

Source: Energy Commission Staff calculations and BAAQMD 2005a

AIR QUALITY Table 14
Project Maximum Annual Emissions
(pounds per year [lb/yr] and tons per year [tpy])

Process Description	NO_x	CO	POC	PM10	SO_2
Annual, 4 Turbines & Duct Burners	168,098	196,984	56,670	87,600.00	16,786.63
Fire Pump Diesel Engine (100 hours)	428.00	16.00	4.00	4.53	9.33
8760 hours 1-cell Cooling Tower	-	-	-	3,101.33	-
8760 hours 6-cell Cooling Tower	-	-	-	15,999.79	-
Total Maximum Annual Emissions (lb/yr)	168,526	197,000	56,674	106,706	16,796
Total Maximum Annual Emissions (tpy)	**84.26**	**98.50**	**28.34**	**53.35**	**8.40**
RPDOC Annual Emissions Limits (tpy)	**99.2**	**98.6**	**28.3**	**53.3**	**8.4**

Source: Energy Commission Staff calculations and BAAQMD 2005a, Table 5

The applicant has requested a 99.2 ton per year NO_x emissions cap for the project to allow for operations flexibility (LECEF 2003, Table 8.1-40), and it appears that with the new NO_x BACT determination, the District supports this limit (BAAQMD 2005a, p. 2).

Ammonia Emissions

To control NO_x emissions from the combustion turbines, ammonia will be injected into the flue gas stream as part of the SCR system. In the presence of the catalyst, the ammonia and NO_x react to form harmless elemental nitrogen and water vapor. However, not all of the ammonia reacts with the flue gases to reduce NO_x; a portion of the ammonia passes through the SCR and is emitted unaltered from the stacks. These ammonia emissions are known as ammonia slip. It should be noted that a maximum permitted ammonia slip rate only occurs after significant degradation of the SCR catalyst, usually five years or more after commencing operations. At that point, the SCR catalysts are removed and replaced with new catalysts. During the majority of the operational life of the SCR system, actual ammonia slip will be at 10 to 50 percent of the limit.

In order to minimize the formation of secondary PM to the extent possible, staff believes an ammonia emissions limit of five ppm @ 15% O_2 (3-hour rolling average) is technologically and economically feasible. This maximum ammonia slip level is recommended on page 7 of ARB's *"Guidance for Power Plant Siting and Best Available Control Technology As Approved by the Air Resources Board on July 22, 1999"*. The South Coast Air Quality Management District, a recognized leader among air districts, has been requiring five ppm ammonia slip over the past two years as part of their BACT/LAER requirements. The South Coast AQMD proposed this control level based, in part, on the ARB Guidance Document that recommended that air districts establish a health protective ammonia slip limit at or below five ppm for combined cycle power plants. Furthermore, the recent Malburg Generation Station (Vernon City), licensed by the Commission, includes a five ppm ammonia slip limit for its GTX100 combined cycle power plant.

Based on the previously approved Roseville Energy Park case (03-AFC-1), staff proposes condition of certification AQ-SC11. This condition serves two purposes. First, it will substantially limit the facility emissions of ammonia to 5 ppm, without forcing the

facility owner to replace or retrofit the SCR catalyst when the facility is emitting less than 5 ppm ammonia. Second, this condition will require complete documentation of the rate of catalyst degradation over the life of the facility, which will provide concrete data for future siting cases of this type. Staff believes that this limit is both technically and economically feasible, even in combination with the 2.0 ppm NO_x limit, and minimizes the potential contribution of ammonia emissions to secondary PM10 formation.

Proposed Annual Emissions Increase

Since the Los Esteros Critical Energy Facility is currently in operations as a simple cycle facility, it is appropriate to compare the proposed combined cycle operational emissions to the existing simple cycle emissions. This proposed annual emissions increase will be used for calculating emissions mitigation requirements. As stated above, staff assumes the District's and applicant's proposed NO_x emissions annual cap.

AIR QUALITY Table 15
Proposed Annual Emissions Increases
(tons per year [tpy])

	NO_x	CO	POC	PM10	SO_2
Proposed Combined Cycle Limits	99.200	98.6	28.3	53.35 [a]	8.4
Original Simple Cycle Limits	74.900	72.9	20.8	44.20 [a]	5.8
Proposed Emissions Increases	**24.300**	**25.7**	**7.5**	**9.15**	**2.6**

[a] PM10 values are the turbine emissions limits plus the PM10 emissions from the cooling towers.

Source: Energy Commission Staff calculations and BAAQMD 2005a

The district RPDOC, condition 35, page 36, incorrectly specifies the POC requirement as 7.3 tpy. This is based on an error in table RPDOC Table 8, page 21, where the Current Facility Emission Permit Limit is listed as 21.0 tpy instead of 20.8 tpy (as correctly listed in RPDOC Table 4, page 12). Staff submitted comments on the RPDOC on April 25, 2005, including this correction.

PROJECT IMPACTS

MODELING APPROACH

While the emissions are the actual mass of pollutants emitted from the project, the impacts are the concentration of pollutants from the project that reach the ground level. When emissions are expelled at a high temperature and velocity through the relatively tall stack, the pollutants will be significantly diluted by the time they reach ground level. The emissions from the proposed project are analyzed through the use of air dispersion models to determine the probable impacts at ground level.

The applicant performed an air dispersion modeling analysis using the U.S. EPA approved version 3 of the Industrial Source Complex Short Term model (ISCST3) to evaluate the project’s potential impacts on the area, during both construction and operation. As part of the input data for this analysis, the applicant used a meteorological data set from the Alviso monitoring station spanning the years 1996-2000. ISCST3 is a

generally accepted model for this type of project and the input meteorological input data is sufficient.

Staff uses actual maximum ambient measurements from the area surrounding the project site to define the "worst case background" ambient conditions. Staff then adds the facility's model predicted maximum impact to this worst case background value to predict a "worst case potential impact" for comparison to the ambient air quality standards.

For this project, staff based the background values on maximum measurements from ambient monitoring stations in the Santa Clara County region over the years 2000-2002 for all pollutants, except the PM2.5 annual impact. For PM2.5, the maximum 98th percentile impact from the same region and period was used, since violation of the limiting standard is based on this measurement.

CONSTRUCTION IMPACTS

The construction air quality impact analyses prepared by the applicant considered both fugitive dust generated from the construction activity and combustion emissions produced by all necessary construction equipment.

The 1-hour NO_2 impact was calculated using the Ozone Limiting Method (OLM). Both the U.S. EPA (Appendix W of 40 CFR Part 51) and ARB recommend the use of OLM as a second level screening analysis for the determination of NO_2 impacts. This method basically assumes that the conversion rate of NO to NO_2 is limited by the amount of ozone (O_3) present in the atmosphere. This assumption is based on the fact that O_3 reacts rapidly with NO forming NO_2 and molecular oxygen. The annual average NO_2 impacts were calculated using the ambient ratio method (ARM) with the EPA default value of 0.75 for the annual average NO_2/NO_x ratio (LECEF 2003, Appendix 8.1-D2.5.2).

The maximum 24-hour impacts were assessed using the emission rates for the month of maximum activity and annual impacts were assessed using the average emissions for the entire construction period. Most of the highest emissions are estimated to occur approximately halfway through the 19 month construction period. The results of this modeling effort are shown in AIR QUALITY Table 16, added to a “worst case” estimate of ambient “background” air quality to determine the overall potential maximum impact of construction.

AIR QUALITY Table 16
Maximum Construction Impacts ($\mu g/m^3$)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour	184	214.3	398.3	470	85%
	Annual	11.5	47.1	58.6	100	59%
CO	1 hour	381.9	11,125	11,506.9	23,000	50%
	8 hour	110.2	7,811	7,921.2	10,000	79%
PM10	24 hour	45.6	76.7	122.3	50	**245%**
	Annual Mean	10.6	28.9	39.5	20	**198%**
SO_2	1 hour	0.85	138	138.85	655	21%
	24 hour	0.09	21.0	21.09	105	20%
	Annual	0.02	5.3	5.32	80	7%

Source: LECEF 2003, Appendix 8.1-D2.5.2, Table 8.1-D2-4

Staff believes that the emissions from the construction of the project present a potentially significant impact because they will contribute to existing violations of the state annual and 24-hour average PM10 AAQS, and that those emissions can and should be mitigated to a level of insignificance. Staff recommends construction conditions of certification AQ-SC1 through AQ-SC5 to mitigate these construction impacts.

INITIAL COMMISSIONING

The conservative, screening level modeling analysis of the initial commissioning impacts for both NO_x and CO are well below the most limiting AAQS and are presented in AIR QUALITY Table 17. Since the most conservative level of modeling shows no potential violation of AAQS, no refined modeling was performed on the initial commissioning activities.

AIR QUALITY Table 17
Maximum Screening Level Impacts from Initial Commissioning ($\mu g/m^3$)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour	110	214	324	470	69%
CO	1 hour	179	11,125	11,304	23,000	49%

Source: LECEF 2003, section 8.1.3.1, p. 8.1-46

PROJECT OPERATION IMPACTS

While the construction and commissioning impacts are both relatively short lived, the operation impacts from the project will continue throughout the life of the facility. The operation impacts are thus subjected to a more refined level of analysis. The following sections discuss the air quality impacts of project operation under fumigation meteorological conditions, during combustion turbine startup and during steady-state operations.

Fumigation Impacts

Surface air is usually very stable during the early morning hours before sunrise. During such meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed and diluted. When the sun first rises, the air at ground level is heated resulting in turbulent vertical mixing (both rising and sinking) of air within a few hundred feet of the ground. Emissions from a stack that enter this turbulent layer of air will also be vertically mixed, bringing some of those emissions down to ground level before significant dispersion occurs and possibly causing abnormally high short term impacts. As the sun continues to heat the ground, this vertical mixing layer becomes thicker over time, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

The applicant used the U.S. EPA approved SCREEN3 model for the calculation of fumigation impacts, without a shore line assumption, since the proposed facility is approximately 3 km from the nearest large body of water (the San Francisco Bay). AIR QUALITY Table 18 shows the highest modeled fumigation impacts in comparison with the one hour NO_2, SO_2 and CO standards. Since fumigation impacts will not typically occur for more than a one hour period, only the impacts on the one hour standards are shown. The results of the modeling analysis show that fumigation impacts will not violate any of the one hour standards.

AIR QUALITY Table 18
CTG Fumigation Modeling
Maximum 1 hour Impacts ($\mu g/m^3$)

Pollutant	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	68.9	214	283	470	60%
CO	70.6	11,125	11,196	23,000	49%
SO_2	0.97	138	139.0	655	21%

Source: LECEF 2003, Table 8.1-43 (p. 8.1-44), and Appendix Table 8.1-B2-5

Refined Modeling Analysis

The applicant and the district provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during both steady state operation and startup conditions. The worst case (maximum) results of this modeling analysis are shown in AIR QUALITY Table 19.

AIR QUALITY Table 19
Refined Modeling Maximum Impacts ($\mu g/m^3$)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour [a]	217.0	214.3	431	470	92%
	1 hour [b]	111.2	214.3	325.5	470	69%
	Annual	0.4	47.1	48	100	48%
CO	1 hour [b]	274	11,125	11,399	23,000	50%
	8 hour [c]	57	7,811	7,868	10,000	79%
PM10	24 hour	4.9	76.7	82	50	**163%**
	Annual Mean	0.1	28.9	29.0	20	**145%**
PM2.5	24 hour	4.9	55.4 [d]	60	65	93%
	Annual Mean	0.1	12.4	12.5	12	**104%**
SO_2	1 hour	30.9	138	168.9	655	26%
	24 hour	1	21.0	22.0	105	21%
	Annual	0.01	5.3	5.3	80	7%

[a] modeled 1-hour average impacts during required periodic fire pump testing
[b] modeled 1-hour average impacts during a normal startup procedure
[c] based on a short term CO emissions limit of 9.0 ppm (BAAQMD 2005a)
[d] maximum 98th percentile ambient measurement in Santa Clara county over the years 2000-2002

Source: BAAQMD 2005a; and LECEF 2003, Table 8.1-46 (p. 8.1-47), and Appendix Table 8.1-B2-5

Startup impacts are much larger than steady state impacts not only because the emissions are larger, but also because the flue gas stream is ejected at a lower velocity and temperature. This reduced emissions velocity means the pollutants will settle faster and thus have less time to dilute before reaching the ground. Note that the values presented are very conservative, so in comparison, average startup events are likely to have significantly less impact.

This table shows that during worst case normal operations, the facility will not cause a violation of any ambient air quality standards, though it will contribute to the existing PM10 and PM2.5 problems. Note that this analysis conservatively assumes the highest single one hour ambient NO_x level (217 $\mu g/m^3$) from the past three years as a background to which all project impacts are added to determine the final level of impact. Because such a high background level is extremely unlikely to occur at the same location as the maximum impacts from the project, these modeled conditions are considered worst case and thus conservative.

Since the project's impacts alone do not cause a violation of any NO_2, CO or SO_2 ambient air quality standards under such conservative assumptions, staff considers the project impacts for those pollutants to be insignificant. However, all project emissions of PM10 would contribute to the existing PM10 and PM2.5 problems in the Bay Area; thus, staff considers these impacts to be cumulatively significant.

Secondary Pollutant Impacts

The project's gaseous emissions of NO_x, SO_2, POC and ammonia can contribute to the formation of the secondary pollutants ozone and PM10. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning

efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no models approved by a regulatory agency for assessing single source ozone impacts. However, because of the known relationship of NO_x and POC emissions to ozone formation, it can be said that the emissions of NO_x and POC from the project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

There is a known relationship between emissions of ammonia, NO_x and SO_2 and the formation of ammonium nitrate and sulfate-based PM10. Whether the ammonia, NO_x and SO_2 impacts are significant depends on the likelihood of ambient PM10 violations. The Bay Area Air Basin currently experiences violations of the state PM10 AAQS and is classified as a nonattainment area. Staff thus considers both the primary and secondary PM10 emissions from the project to be a significant contribution to an existing problem.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions would be required if the project were subject to the Federal Prevention of Significant Deterioration (PSD) permitting program. However, LECEF is not subject to PSD permitting because all emissions limits are below the 100 ton per year trigger for PSD review, so no visibility analysis was completed for this project. The nearest Class I areas to the project are the Point Reyes National Seashore and the Pinnacles National Monument. Due to the distance to Class I areas and the fact that this project is not a major stationary source, the project's visibility impacts on Class 1 areas are not considered significant.

LOCAL CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impact analysis, staff needs project-specific information about probable future projects in the vicinity of the LECEF Phase 2 project. This is done to analyze the modeled contribution of the project when added to any other likely new emissions sources in the local project vicinity. The time at which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when that project applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that each project applicant develop the modeling input parameters to perform a modeling analysis. Therefore, our local cumulative impacts analysis evaluates only those future projects that are currently under construction or District review.

The applicant did not provide an adequate modeling analysis of the project's emissions in combination with the emissions of other existing and probable future projects in the area, as required by siting regulations. Rather, the analysis provided concludes that the project produces a net benefit to air quality by assuming substantial "benefit ratio" credit to the particulate matter mitigation required for the original LECEF project (CH2MHill 2004). Using this approach, and assuming that the project's impacts are beneficial, the applicant implies that no local cumulative analysis is necessary to determine the potential cumulative impact of its emissions. Thus, the AFC is devoid of any local cumulative impact modeling analysis incorporating soon-to-be-added local sources.

There are two problems with the applicant's approach. First, even if the mitigation for the initial project more than offsets project impacts, the Commission always requires project proponents to address cumulative impacts, including modeling potential local cumulative sources. (See Cal. Admin. Code, Title 20, Appendix B, §(g)(8)(I)(iii).) Second, staff believes that the applicant has used unsupported and excessive "benefit ratios" to calculate the air quality benefits of the mitigation for the original LECEF license.

Staff has extensively discussed these benefit ratios with the applicant, and repeatedly expressed disagreement with the justification for them. Using Calpine's proposed ratios, converting approximately four residential wood burning stoves to natural gas devices would satisfy the entire Los Esteros PM10 mitigation requirement. Staff continues to believe that such impact ratios are unrealistic and excessive.

Though the information submitted by the applicant is insufficient to estimate the potential cumulative impact of the LECEF Phase 2 project, staff believes a determination can still be made based on the information available. Energy Commission Siting Regulations Appendix B (g)(8)(I)(iii) requires, "The cumulative inert pollutant impact analysis should assess whether estimated emissions concentrations will cause or contribute to a violation of any ambient air quality standard." Thus, in order to make a determination, staff must show that the region will not be at risk of a new violation of any AAQS due to the cumulative operation of identified future projects in combination with the LECEF Phase 2 project.

In order to determine this, staff used the cumulative impact analysis submitted by Silicon Valley Power for the Pico Power Project (PPP) (PPP 2002) in combination with the standard modeling impact analysis submitted by the applicant for the LECEF Phase 2 project by itself. The PPP site is located approximately 3.45 miles to the southwest of the LECEF site, and the PPP cumulative impact analysis included the LECEF Phase 1 project. The PPP cumulative impact analysis identified a total of 61 emissions sources within eight miles of the PPP site, 30 of which were minor sources of POC. PPP prepared a screening analysis of the remaining 31 sources, and finally prepared an impact modeling analysis including the 16 most significant sources to predict maximum criteria pollutant impacts on the local region. Staff used the impact modeling from both LECEF Phase 2 and the PPP cumulative impact assessment to estimate the maximum cumulative impact in the local region. These estimated impacts are presented in AIR QUALITY Table 20 below.

AIR QUALITY Table 20
Maximum Modeled Cumulative Impacts ($\mu g/m^3$)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour	217	214.3	431	470	92%
	Annual	12	47	59	100	59%
CO	1 hour	616	11,125	11,741	23,000	51%
	8 hour	166	7,811	7,977	10,000	80%
PM10	24 hour	4.9	76.7	82	50	**163%**
	Annual	1.2	28.9	30.1	20	**151%**
SO_2	1 hour	41.3	138	179.3	655	27%
	24 hour	10.2	21.0	31.2	105	30%
	Annual	2.5	5.3	7.8	80	10%

Source: Energy Commission Staff calculations, BAAQMD 2005a, and SVP 2002

These values overestimate the impacts, and thus should be considered very conservative, but they do show that the cumulative local impact is unlikely to cause a new violation of any AAQS. The only significant impact is the continued contribution to the existing PM10 problem, which further supports staffs recommendation for full PM10 mitigation by the LECEF Phase 2.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

This section presents the applicant's proposed mitigation for the project, followed by staff's analysis of the adequacy of the applicant's proposal.

Construction Mitigation

The applicant proposes a number of mitigation and emissions control measures for use during the construction of the project. The applicant specifically proposes the following measures to control exhaust emissions from heavy diesel construction equipment (LECEF 2003, Appendix 8.1-D2.3):

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

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

- Use either water application or chemical dust suppressant application to control dust emissions from unpaved surface travel and unpaved parking areas;
- Use vacuum sweeping and/or water flushing of paved road surfaces to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard;
- Limit traffic speeds on unpaved site areas to 25 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to roadways;
- Replant vegetation in disturbed areas as quickly as possible;
- As needed, use gravel pads along with wheel washers or wash tires of all trucks exiting construction site that carry track-out dirt from unpaved surfaces; and
- Mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant and/or use of wind breaks.

Operations Mitigation

A discussion of the proposed emission controls for the project is presented under the Emissions Controls section under the Project Description and Emissions heading above.

PM10 Mitigation

LECEF Phase 2 will have the potential to emit an additional 9.15 tons per year of PM10 (AIR QUALITY Table 15) compared to the simple cycle facility, resulting in a maximum 24-hour average ground level ambient impact increase of approximately 4.1 $\mu g/m^3$. Although the Bay Area Air Basin is classified as nonattainment for the state PM10 AAQS (AIR QUALITY Table 4 and Figure 2), the project will not be required by the District to provide PM10 offsets because the quantity of PM10 emitted by the project is below the District's offset threshold of 100 tons per year (as set by District rule). The project’s emissions, however, contribute to existing violations of the state 24-hour PM10 standard, which staff considers a significant impact requiring mitigation pursuant to CEQA.

Staff and the applicant previously discussed PM10 mitigation extensively during the Los Esteros Phase 1 (simple cycle relicense) analysis, and at the Phase 2 PSA workshop agreed that the same PM10 mitigation solution used for Phase 1 can also be used for Phase 2. This approach is based on two factors: the seasonal nature of PM10 violations in the Bay Area Air Basin, and the use of SO_2 ERCs to mitigate PM10 emissions.

First, PM10 ambient violations in the Bay Area Air Basin occur predominately in the fall and winter quarters (CEC 2002a and CEC 2002b). This pattern is also clear in AIR QUALITY Figure 3 above, where ambient PM2.5 (a subset of PM10) values spike in the

fall and winter months. For this reason, mitigation is proposed for only half of the PM10 increase, or a total of 4.576 tons of PM10.

Second, because SO_2 is a precursor pollutant to PM10, staff and the applicant propose that SO_2 reductions be used for PM10 credit at a trading ratio of 3:1. This interpollutant ratio is based on District Rule 2-2-301.1, which allows SO_2 ERCs to be used in place of PM10 ERCs at a trading ratio set by the APCO (Air Pollution Control Officer). The most recent case where such a ratio was set was the East Altamont case, where the 3:1 ratio was proposed and accepted by the District. Thus, an interpollutant trade of 3 pounds of SO_2 reductions for each pound of PM10 reductions required, a total of 13.73 tons of SO_2 ERC, is proposed.

Staff proposes condition **AQ-SC9** to both confirm the withdrawal of the previously required 34.11 tons of SO_2 ERCs necessary to mitigate the outstanding Phase 1 (simple cycle) PM10 liability prior to the start of Phase 2 construction, and to require the necessary 13.73 tons of SO_2 ERCs to fully mitigate the potential Phase 2 (combined cycle) PM10 increase.

Emission Offsets

District Regulation 2-2-302 requires that the applicant provide emission offsets, in the form of banked ERCs, for the project's emissions of NO_x and POC. The projected emissions of PM10 and SO_2 are below the District's thresholds for requiring offsets. District Regulation 2-2-302 requires a trading ratio of 1.15:1.00 for the facility NO_x liability (i.e. for every one ton of NO_x emissions from the facility, 1.15 tons of NO_x ERCs must be provided) and a trading ratio of 1:1 for the facility POC liability. Though District Regulation 2-2-302.2 allows POC credits to be used to mitigate a NO_x liability at a 1:1 ratio, since both pollutants are precursors to the formation of ozone, the applicant has committed to providing NO_x ERCs for all NO_x emissions in order to mitigate any potential nitrogen deposition impact (Sierra 2005a, pg. 2).

In addition, and as discussed above, the applicant has agreed to surrender 14.250 tons of SO_2 ERCs in order to mitigate the potential fall and winter quarter PM10 emissions increase.

The applicant has identified two available ERCs for NO_x, one for POC and one for SO_2 to satisfy these requirements. These certificates' numbers, the location of the sources they were derived from, and the amount of emissions reductions they represent are presented in AIR QUALITY Table 21 below. This shows that the applicant is currently in possession of sufficient ERCs to fully mitigate the potential emissions increases from the project.

AIR QUALITY Table 21
Emission Reduction Credits

ERC#	Location (city)	Date Banked	Source Type	NO_x (tpy)	POC (tpy)	SO_2 (tpy)
#724	Palo Alto	3/13/96	Cardinal Cogen	7.100	-	-
#856	San Pablo	4/23/02	Myers Container Corp.	-	26.522	-
#896	San Francisco	9/30/85	Potrero Power Plant	304.594	-	90.000
			Total ERCs Owned	**311.694**	**26.522**	**90.000**
			Los Esteros Phase 2 ERC Requirement	**27.945**	**7.500**	**13.730**

Source: AIR QUALITY Table 15 above, BAAQMD 2005a, LECEF 2003, and Sierra 2005b

ADEQUACY OF PROPOSED MITIGATION

Adequacy of Construction Mitigation

Staff agrees with most of the applicants proposed mitigation measures. However, because of the predicted significant contribution to both the short- and long-term PM10 problems caused by construction activities associated with the project, staff believes additional construction mitigation measures are necessary. Staff proposes conditions of certification that implement both the applicant suggested controls and staff's proposed additional necessary mitigation (**AQ-SC1** through **AQ-SC5**). These conditions were discussed with the applicant at the PSA Workshop and incorporate all modifications agreed to by both parties.

Adequacy of Operations Mitigation

NO_x Controls

The proposed 2.0 ppm 1-hour average control level for NO_x will be reached through the use of a selective catalytic reduction system. The District has found this level to be BACT for this type of facility, and appears to have the support of both ARB and U.S. EPA. This is adequate control for NO_x.

POC and CO Controls

The permitted POC and CO emissions levels will be reached through the use of an oxidation catalyst system to treat all exhaust gasses. The proposed controls will limit POC emissions to 2.0 ppm. The proposed controls will limit short-term emissions of CO to 9.0 ppm, while annual emissions of CO will be limited to a 4.0 ppm average. The District has found these levels to be BACT for this type of facility, based on an analysis of emissions data from the Valero Cogeneration Unit, a combustion test conducted at LECEF late last year, and a request from the applicant to increase the CO limit from 4.0 to 9.0 due to the proposed 2.0 NO_x limit (BAAQMD 2005a, pg. 18).

The proposed 9.0 ppm CO level is significantly higher than the BACT level set for other recent projects using similar or identical technology, such as the Pico Power Project which was permitted with a 4.0 ppm CO limit and 2.0 ppm NO_x limit. Further, this CO limit is higher than the current simple cycle CO limit of 4.0 ppm and the ARB 1999 BACT Guidance of 6 ppm.

On April 25, 2005, Energy Commission staff submitted a comment letter to the district that identified this concern (CEC 2005a). The letter specified that "though the Energy Commission does not set BACT, staff is concerned that disagreement between the District, ARB and U.S. EPA on this issue could further delay the issuance of a Final Determination of Compliance (FDOC)." On April 29, 2005, U.S. EPA submitted comments on the RPDOC to the districting indicating that "... Los Esteros should be able to meet its original commitment of 4.0 ppm CO when using a CO catalyst." (EPA 2005a).

PM10 and SO_2 Controls

The sole use of pipeline quality natural gas fuel satisfies District BACT requirements for both PM10 and SO_2. This level of emissions control is thus considered adequate to control direct PM10 and SO_2 emissions.

Cooling Tower Emission Controls

The applicant's use of drift eliminators with an efficiency of 0.0005 percent on the proposed cooling tower represents the state-of-the-art of drift eliminator design. This level of emissions control is thus considered adequate to minimize potential PM10 emissions.

Emissions Offsets

The applicant agreed to fully mitigate the NO_x and POC emission increases, as required by District rules. The applicant further agreed to mitigate the fall and winter quarter PM10 increases. The proposed emissions offsets (AIR QUALITY Table 21) will be sufficient to fully mitigate all emissions increases from the project.

The potential CO emission increases from the project will not cause or contribute to a violation of any CO AAQS, as shown in AIR QUALITY Table 19, and thus are not significant.

STAFF PROPOSED MITIGATION

Construction Mitigation

The modeling assessment discussed earlier shows that the combustion sources used for heavy construction have the potential for causing significant air quality impacts, based specifically on the state 24-hour and annual PM10 AAQS. Staff has determined that the use of oxidizing soot filters is a viable emissions control technology for all heavy diesel powered construction equipment that does not use an ARB certified low emission diesel engine and ultra-low sulfur content diesel fuel. In addition, staff proposes that prior to the commencement of construction, the applicant provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies the mitigation measures that the applicant will employ to limit air quality impacts during construction. Staff includes proposed staff Conditions of Certification AQ-SC1 through AQ-SC5 below to implement these requirements.

FACILITY CLOSURE

Eventually, the Los Esteros Critical Energy Facility will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease and thus all impacts associated with those emissions would cease as well.

A Permit to Operate, issued by the District under Regulation 2-3-302, is required for operation of the facility. If the applicant chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant complied with state and District requirements and paid the fees to renew the Permit to Operate.

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

COMPLIANCE WITH LORS

FEDERAL

On April 29, 2005, the U.S. EPA submitted comments on the RPDOC to the District (EPA 2005a). Those comments should be resolved by publication of the FDOC.

STATE

On April 25, 2005, staff submitted comments on the RPDOC to the District (CEC 2005a). In addition to minor corrections to calculations and text, staff commented on the District's new BACT determination for CO, the inclusion of 320 hours per year of allowed NO_x excursions, the quantity of required POC emission reduction credits, and the proposed ammonia slip control limit.

The Air Resources Board is currently reviewing the RPDOC, and may provide comments on the document before publication of the FDOC.

LOCAL

The District issued a Revised Preliminary Determination of Compliance for public comment on March 16, 2005, including a full set of proposed permit conditions. The District found the project in compliance with all District rules and regulations. However, staff can not determine if the project is in compliance with local LORS until all RPDOC comments are resolved, likely with the publication of an FDOC by the District.

CONCLUSIONS AND RECOMMENDATIONS

The project's PM10 and PM2.5 operational emissions can, if left unmitigated, contribute to existing violations of the state 24-hour and annual PM10 standards, as well as the state annual PM2.5 standard, especially during the winter season. However, if the mitigation measures discussed in this assessment and in proposed Condition of Certification **AQ-SC9** are fully implemented, the direct particulate matter emission impacts would be sufficiently mitigated by the applicant's provision of banked offsets.

In addition, the project will emit ammonia, a PM10 precursor that has the potential to contribute to the existing PM10 problem in the region. Staff believes that measures can be taken to minimize significant secondary PM10 impact by controlling ammonia as much as feasible, as set forth in Condition AQ-SC11. That condition requires the project owner to retrofit or replace the SCR catalyst within one year of the ammonia emissions reaching 5 ppm. This will effectively limit the long term average emissions to 5 ppm or less, without forcing the facility to initiate maintenance at ammonia emissions levels significantly below 5 ppm. Staff believes this will minimize the contribution of ammonia emissions to secondary PM10 formation.

While the project alone would not cause new violations of any ambient air quality standards, the project POC and NO_x emissions may contribute to the existing violations of the state and the federal 1-hour ozone standards. The applicant has agreed to fully mitigate the POC and NO_x increases (in the form of emission reduction credits) and thus the project's POC and NO_x impacts will be less than significant.

Staff recommends additional construction related mitigation, which is described in Conditions of Certification **AQ-SC1** to **AQ-SC5**. Staff believes that with this addition, the project's construction impacts from PM10 and PM2.5 emissions will be mitigated to a less than significant level.

CONDITIONS OF CERTIFICATION

Staff Conditions (AQ-SC) below for construction mitigation .The District published proposed conditions of certification in the District RPDOC, and on April 4, 2005, the applicant commented on these conditions. Staff includes below the District proposed conditions, without the modifications proposed by the applicant. The District may incorporate the modifications proposed by the applicant, as well as comments submitted by staff and potentially by ARB and EPA, in the District FDOC. The FDOC should be published in May, 2005.

DEFINITIONS

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in Btu/scf.
Firing Hours:	Period of time, during which fuel is flowing to a unit, measured in fifteen-minute increments.
MMBtu:	million British thermal units
Gas Turbine Start-up Mode:	The time beginning with the introduction of continuous fuel flow to the Gas Turbine until the requirements listed in Part 19 are satisfied. In no case shall the duration of a start-up exceed 240 minutes.
Gas Turbine Shutdown Mode:	The time from non-compliance with any requirement listed in part 19 until termination of fuel flow to the Gas Turbine, but not to exceed 30 minutes.
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO or NH_3) corrected to a standard stack gas oxygen concentration. For an emission point (exhaust of a Gas Turbine) the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired following the installation of the duct burners and associated equipment, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange. The Commissioning Period shall not exceed 180 days under any circumstances.
Alternate Calculation:	A District approved calculation used to calculate mass emission data during a period when the CEM or other monitoring system is not capable of calculating mass emissions.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate

PERMITTED EQUIPMENT DESIGNATIONS

S-1 Combustion Gas Turbine #1 with Water Injection, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM BTU/hr (HHV) maximum heat input rating; abated by A-1 Oxidation Catalyst and A-2 Selective Catalytic Reduction System

S-2 Combustion Gas Turbine #2 with Water Injection, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM BTU/hr (HHV) maximum heat input rating; abated by A-3 Oxidation Catalyst and A-4 Selective Catalytic Reduction System

S-3 Combustion Gas Turbine #3 with Water Injection, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM BTU/hr (HHV) maximum heat input rating; abated by A-5 Oxidation Catalyst and A-6 Selective Catalytic Reduction System.

S-4 Combustion Gas Turbine #4 with Water Injection, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM BTU/hr (HHV) maximum heat input rating; abated by A-7 Oxidation Catalyst and A-8 Selective Catalytic Reduction System

S-5 Fire Pump Diesel Engine, John Deere Model JDFP-06WR, 290 bhp, 13.5 gal/hr

S-7 Heat Recovery Steam Generator #1, equipped with low-NO_x Duct Burners, 139 MM BTU/hr abated by A-1 Oxidation Catalyst and A-2 Selective Catalytic Reduction System

S-8 Heat Recovery Steam Generator #2, equipped with low-NO_x Duct Burners, 139 MM BTU/hr abated by A-3 Oxidation Catalyst and A-4 Selective Catalytic Reduction System

S-9 Heat Recovery Steam Generator #3, equipped with low-NO_x Duct Burners, 139 MM BTU/hr abated by A-5 Oxidation Catalyst and A-6 Selective Catalytic Reduction System

S-10 Heat Recovery Steam Generator #4, equipped with low-NO_x Duct Burners, 139 MM BTU/hr abated by A-7 Oxidation Catalyst and A-8 Selective Catalytic Reduction System

S-11 Six-Cell Cooling Tower, 73,000 gallons per minute

STAFF CONDITIONS OF CERTIFICATION

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions **AQ-SC3**, **AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the CPM.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates. The AQCMM and all Delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with conditions **AQ-SC3**, **AQ-SC4** and **AQ-SC5**.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report (MCR) that demonstrates compliance with the following mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the Project. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a) All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of **AQ-SC4** (the prevention of fugitive dust plumes). The frequency of watering can be reduced or eliminated during periods of precipitation.

b) No vehicle shall exceed 10 miles per hour within the construction site.

c) The construction site entrances shall be posted with visible speed limit signs.

d) All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

e) Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f) All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

g) All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

h) Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

i) All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

j) At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.

k) All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

l) All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

m) Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall include in the MCR (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of any complaints filed with the air district in relation to project construction, and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (1) off the project site or (2) 200 feet beyond the centerline of the construction of linear facilities or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source.

The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified.

AQ-SC5 Diesel-Fueled Engines Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report (MCR), a construction mitigation report that demonstrates compliance with the following mitigation measures for the purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a) All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.

b) All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

c) All construction diesel engines, which have a rating of 100 hp or more, shall meet, at a minimum, the Tier 1 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. In the event a Tier 1 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a catalyzed diesel particulate filter (soot filter), unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is “not practical” if, among other reasons:

(1) There is no available soot filter that has been certified by either the California Air Resources Board or U.S. Environmental Protection Agency for the engine in question; or

(2) The construction equipment is intended to be on-site for ten (10) days or less.

(3) The CPM may grant relief from this requirement if the AQCMM can demonstrate that they have made a good faith effort to comply with this requirement and that compliance is not possible.

d) The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within ten (10) working days of the termination:

(1) The use of the soot filter is excessively reducing normal availability of the construction equipment due to increased downtime for

maintenance, and/or reduced power output due to an excessive increase in backpressure.

(2) The soot filter is causing or is reasonably expected to cause significant engine damage.

(3) The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.

(4) Any other seriously detrimental cause which has the approval of the CPM prior to the termination being implemented.

e) All heavy earthmoving equipment and heavy duty construction related trucks with engines meeting the requirements of (c) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

f) All diesel heavy construction equipment shall not remain running at idle for more than five minutes, to the extent practical.

Verification: The project owner shall include in the MCR (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of all diesel fuel purchase records, (3) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and (4) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM for review any modification to any air permit for the project proposed by the District or any other agency.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five business days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from any agency. The project owner shall submit a final copy of any modified air permit to the CPM within 15 business days after the issue date on the permit.

AQ-SC7 The project shall surrender the emission offset credits listed in Appendix A or a modified list, as allowed by this condition, at the time that surrender is required by condition **AQ-35** (district permit Part 35). The project owner may request CPM approval for any substitutions or modification of credits listed in Appendix A. The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, the requested change(s) clearly will not cause the project to result in a significant environmental impact, and each requested change is consistent with applicable federal and state laws and regulations.

Verification: The project owner shall submit to the CPM a list of ERCs to be surrendered to the District at least 60 days prior to initial startup. If the CPM, in consultation with the District, approves a substitution or modification, the CPM shall file

a statement of the approval with the commission docket and mail a copy of the statement to every person on the post-certification mailing list. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC8 The project owner shall comply with all staff (AQ-SC) and district (AQ) Conditions of Certification. The CPM, in consultation with the District, may approve any change to a Condition of Certification regarding air quality, as an insignificant change, provided that: (1) the project remains in compliance with all applicable laws, ordinances, regulations, and standards, (2) the requested change clearly will not cause the project to result in a significant environmental impact, (3) no additional mitigation or offsets will be required as a result of the change, (4) no existing daily, quarterly, or annual permit limit will be exceeded as a result of the change, and (5) no increase in any daily, quarterly, or annual permit limit will be necessary as a result of the change.

Verification: The project owner shall notify the CPM in writing of any proposed change to a condition of certification pursuant to this condition and shall provide the CPM with any additional information the CPM requests to substantiate the basis for approval.

AQ-SC9 The project owner/operator shall submit documentation proving the previous withdrawal of 34.11 tons of SO_x Emissions Reductions Credits (ERCs). The project owner/operator shall further surrender an additional 14.250 tons of SO_x ERCs.

Verification: The project owner/operator shall submit proof of previous withdrawal of 34.11 tons of SO_x ERCs prior to the start of construction on the Combined Cycle conversion of the project. The project owner/operator shall surrender the remaining 14.250 tons of SO_x ERCs to the district for permanent withdrawal from the bank prior to first fire of any gas turbine following the installation of the duct burners and associated equipment. The owner/operator shall submit all documentation of the surrender to the CPM by the same date. Copies of documentation from the district proving permanent withdrawal of any submitted ERCs from the district bank shall be submitted by the owner/operator to the CPM as soon as issued by the district.

AQ-SC10 The project owner shall report to the CPM the quantity of CO_2 emitted on an annual basis as a direct result of electricity generation.

Verification: CO_2 emissions shall be reported to the CPM once per calendar year, as part of the first quarterly compliance report submitted each year as required in Condition of Certification **AQ-34**.

AQ-SC11 The SCR catalyst shall be replaced, repaired or otherwise reconditioned within 12 months of the ammonia slip reaching 5 ppm @ 15 percent O_2 averaged over 24 hours. The SCR ammonia injection grid replacement, repair or reconditioning scheduled event may be canceled if the project owner can demonstrate to the CPM that, subsequent to the initial exceedance, the ammonia slip consistently remains below 5 ppm @ 15 percent O_2 averaged over 24 hours and that the initial exceedance does not accurately indicate expected future operating conditions.

Compliance with ammonia slip limits shall be demonstrated by using the following calculation procedure:

ammonia slip ppmv @ 15% O_2 = ((**a**-(**b**x**c**/1,000,000)) x 1,000,000 / **b**) x **d**

where:

a = ammonia injection rate(lb/hr)/17(lb/lb. mol),
b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol),
c = change in measured NO_x concentration ppmv at 15% O_2 across catalyst, and
d = correction factor.

The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip.

Verification: The project owner/operator shall include ammonia slip concentrations averaged on an hourly and 24-hour basis calculated via the protocol provided in each quarterly report required by Condition of Certification **AQ-34**. The project owner shall notify the CPM within 10 days of an exceedance of the 5 ppm ammonia slip limit herein. The project owner shall notify the CPM no less than 30 days prior to the scheduled date of the SCR catalyst replacement, repair, or reconditioning event. If the project owner finds that the exceedance of the 5 ppm ammonia slip limit does not accurately reflect expected future operation as provided for in this condition, the project owner shall submit all relevant information to the CPM no less than 30 days prior to the scheduled date of the SCR catalyst replacement, repair or reconditioning event in order to cancel the event.

COMMISSIONING CONDITIONS OF CERTIFICATION

AQ-1 The owner/operator of the Los Esteros Critical Energy Facility shall minimize the emissions of carbon monoxide and nitrogen oxides from S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators to the maximum extent possible during the commissioning period. **AQ-1** through **AQ-11** shall only apply during the commissioning period as defined above. Unless noted, **AQ-12** through **AQ-49** shall only apply after the commissioning period has ended. (Basis: cumulative increase)

Verification: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.

AQ-2 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1, S-2, S-3 and S-4 Gas Turbine combustors to minimize the emissions of carbon monoxide and nitrogen oxides. (Basis: cumulative increase)

Verification: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.

AQ-3 At the earliest feasible opportunity and in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust and operate the SCR Systems (A-2, A-4, A-6 & A-8) and OC Systems (A-1, A-3, A-5 & A-7) to minimize the emissions of nitrogen oxides and carbon monoxide from S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators. (Basis: cumulative increase)

Verification: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.

AQ-4 Coincident with the steady-state operation of SCR Systems (A-2, A-4, A-6, & A-8) and OC Systems (A-1, A-3, A-5, & A-7) pursuant to **AQ-3**, the owner/operator shall operate the facility in such a manner that the Gas Turbines (S-1, S-2, S-3 and S-4) comply with the NO_x and CO emission limitations specified in **AQ-19a** and **AQ-19c**. (Basis: BACT, offsets)

Verification: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.

AQ-5 The owner/operator of the Los Esteros Critical Energy Facility shall submit a plan to the District Permit Services Division at least two weeks prior to first firing of S-1, S-2, S-3 & S-4 Gas Turbines and/or S-7, S-8, S-9, & S-10 HRSGs describing the procedures to be followed during the commissioning of the turbines in the combined-cycle configuration. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the water injection, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1, S-2, S-3 and S-4) without abatement by their respective SCR Systems. The Gas Turbines (S-1, S-2, S-3 and S-4) shall be fired in combined cycle mode no sooner than fourteen days after the District receives the commissioning plan. (Basis: cumulative increase)

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

AQ-6 During the commissioning period, the owner/operator of the Los Esteros Critical Energy Facility shall demonstrate compliance with **AQ-8** through **AQ-10** through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

a. firing hours
b. fuel flow rates
c. stack gas nitrogen oxide emission concentrations,
d. stack gas carbon monoxide emission concentrations

e. stack gas oxygen concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators. The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.
(Basis: cumulative increase)

Verification: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by **AQ-5** and **AQ-10** respectively.

AQ-7 The owner/operator shall install, calibrate and make operational the District-approved continuous monitors specified in **AQ-6** prior to first firing of each turbine (S-1, S-2, S-3 and S-4 Gas Turbines) and HRSG (S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators). After first firing of the turbine, the owner/operator shall adjust the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NOx emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.
(Basis: BAAQMD 9-9-501, BACT, offsets)

Verification: The project owner/operator shall notify the District and CPM of the date of expected first fire at least 30 days prior to first fire and shall make the project site available for inspection if desired by either the District or CPM.

AQ-8 The owner/operator shall not operate the facility such that the number of firing hours of S-1, S-2, S-3 and S-4 Gas Turbines and/or S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators without abatement by SCR or OC systems exceed 250 hours during the commissioning period. Such operation of the S-1, S-2, S-3 and S-4 Gas Turbines without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or OC system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 250 firing hours without abatement shall expire. (Basis: offsets)

Verification: The owner/operator shall provide written notice to the CPM and the District Permit Services & Enforcement Divisions within five business days of completion of all commissioning activities, at which time the unused balance of the 250 firing hours without abatement shall expire.

AQ-9 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators during the commissioning period shall accrue towards the

consecutive twelve-month emission limitations specified in **AQ-22**. (Basis: offsets)

Verification: The project owner/operator shall specifically demonstrate compliance with this Condition of Certification as part of each Monthly Commissioning Emissions Report required by **AQ-10** and as part of the first Quarterly Operations Report required by **AQ-34** after the completion of commissioning.

AQ-10 The owner/operator shall not operate the facility such that the pollutant mass emissions from each turbine (S-1, S-2, S-3 and S-4 Gas Turbines) and corresponding HRSG (S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators) exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the S-1, S-2, S-3 and S-4 Gas Turbines.

	Without Controls		With Controls	
a. NO_x (as NO_2)	1464 lb/day	102 lb/hr	1464 lb/day	61 lb/hr
b. CO	1056 lb/day	88 lb/hr	984 lb/day	41 lb/hr
c. POC (as CH_4)	288 lb/day		114 lb/day	
d. PM10	60 lb/day		60 lb/day	
e. SO_2	53.6 lb/day		53.6 lb/day	

(Basis: cumulative increase)

Verification: The project owner/operator shall submit to the CPM for approval, a Monthly Commissioning Emissions Report that includes fuel use, turbine operation, post combustion control operation, ammonia use and CEM readings on an hourly and daily basis.

AQ-11 Within sixty (60) days of startup, the owner/operator shall conduct a District approved source test using external continuous emission monitors to determine compliance with **AQ-10**. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Thirty (30) days before the execution of the source tests, the owner/operator shall submit to the District a detailed source test plan designed to satisfy the requirements of this part. The owner/operator shall be notified of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District comments into the test plan. The owner/operator shall notify the District within ten (10) days prior to the planned source testing date. Source test results shall be submitted to the District within sixty (60) days of the source testing date. These results can be used to satisfy applicable source testing requirements in **AQ-26** below. (Basis: offsets)

Verification: The project owner/operator shall submit the source test plan and results as required in the time frames indicated in this Condition of Certification.

OPERATIONS CONDITIONS OF CERTIFICATION

AQ-12 Consistency with Analyses: Operation of this equipment shall be conducted in accordance with all information submitted with the application (and supplements thereof) and the analyses under which this permit is issued unless otherwise noted below. (Basis: BAAQMD 2-1-403)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-13 Conflicts Between Conditions: In the event that any part herein is determined to be in conflict with any other part contained herein, then, if principles of law do not provide to the contrary, the part most protective of air quality and public health and safety shall prevail to the extent feasible.
(Basis: BAAQMD 1-102)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-14 Reimbursement of Costs: All reasonable expenses, as set forth in the District's rules or regulations, incurred by the District for all activities that follow the issuance of this permit, including but not limited to permit condition implementation, compliance verification and emergency response, directly and necessarily related to enforcement of the permit shall be reimbursed by the owner/operator as required by the District's rules or regulations.
(Basis: BAAQMD 2-1-303)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-15 Access to Records and Facilities: As to any part that requires for its effective enforcement the inspection of records or facilities by representatives of the District, the Air Resources Board (ARB), the U.S. Environmental Protection Agency (U.S. EPA), or the California Energy Commission (CEC), the owner/operator shall make such records available or provide access to such facilities upon notice from representatives of the District, ARB, U.S. EPA, or CEC. Access shall mean access consistent with California Health and Safety Code Section 41510 and Clean Air Act Section 114A.
(Basis: BAAQMD 1-440, 1-441)

Verification: The owner/operator shall maintain records for a minimum of five (5) years and provide access to records and facilities as requested by the ARB, EPA, District and CEC.

AQ-16 Notification of Commencement of Operation: The owner/operator shall notify the District of the date of anticipated commencement of turbine operation not less than 10 days prior to such date. Temporary operations under this permit are granted consistent with the District's rules and regulations.
(Basis: BAAQMD 2-1-302)

Verification: The owner/operators shall notify the District and CPM of the date of anticipated commencement of turbine operation not less than 10 days prior to such date.

AQ-17 Operations: The owner/operator shall insure that the gas turbines, HRSGs, emissions controls, CEMS, and associated equipment are properly maintained and kept in good operating condition at all times.
(Basis: BAAQMD 2-1-307)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-18 Visible Emissions: The owner/operator shall insure that no air contaminant is discharged from the LECEF into the atmosphere for a period or periods aggregating more than three minutes in any one hour, which is as dark or darker than Ringelmann 1 or equivalent 20% opacity.
(Basis: BAAQMD 6-301)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-19 Emissions Limits: The owner/operator shall operate the facility such that none of the following limits are exceeded:

a. The emissions of oxides of nitrogen (as NO_2) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 2.0 ppmvd @ 15% O_2 (1-hour rolling average), except during periods of gas turbine startup and shutdown as defined in this permit. The NO_x emission concentration shall be verified by a District-approved continuous emission monitoring system (CEMS) and during any required source test. (Basis: BACT)

b. Emissions of ammonia from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 10 ppmvd @ 15% O_2 (3-hour rolling average), except during periods of start-up or shutdown as defined in this permit. The ammonia emission concentration shall be verified by the continuous recording of the ratio of the ammonia injection rate to the NO_x inlet rate into the SCR control system (molar ratio). The maximum allowable NH3/NO_x molar ratio shall be determined during any required source test, and shall not be exceeded until reestablished through another valid source test. (Basis: BACT)

c. Emissions of carbon monoxide (CO) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 9.0 ppmvd @ 15 % O_2 (3-hour rolling average), except during periods of start-up or shutdown as defined in this permit. The CO emission

concentration shall be verified by a District-approved CEMS and during any required source test. (Basis: BACT)

d. Emissions of precursor organic compounds (POC) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 2 ppmvd @ 15% O_2 (3-hour rolling average), except during periods of gas turbine start-up or shutdown as defined in this permit. The POC emission concentration shall be verified during any required source test. (Basis: BACT)

e. Emissions of particulate matter less than ten microns in diameter (PM10) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 2.5 pounds per hour. The PM10 mass emission rate shall be verified during any required source test. (Basis: BACT & cumulative increase)

f. Emissions of oxides of sulfur (as SO_2) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 1.8 pounds per hour. The SO_2 emission rate shall be verified during any required source test. (Basis: BACT & cumulative increase)

g. Compliance with the hourly NO_x emission limitations specified in part 19(a), at emission points P-1, P-2, P-3, and P-4, shall not be required during short-term excursions, limited to a cumulative total of 320 hours per rolling 12 month period for all four sources combined. Short-term excursions are defined as 15-minute periods designated by the Owner/Operator that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods, when the 15-minute average NO_x concentration exceeds 2.0 ppmv, dry @ 15% O_2. Examples of transient load conditions include, but are not limited to the following:

(1) Initiation/shutdown of combustion turbine inlet air cooling
(2) Initiation/shutdown of combustion turbine water mist or steam injection for power augmentation
(3) Rapid combustion turbine load changes
(4) Initiation/shutdown of HRSG duct burners
(5) Provision of ancillary services and automatic generation control at the direction of the California Independent System Operator (Cal-ISO)

The maximum 1-hour average NO_x concentration for short-term excursions at emission points P-1, P-2, P-3, and P-4 each shall not exceed 5 ppmv, dry @ 15% O_2. All emissions during short-term excursions shall be included in all calculations of hourly, daily and annual mass emission rates as required by this permit.

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-20 Turbine Start-up: The owner/operator shall operate the gas turbines so that the duration of a start-up does not exceed 240 minutes per event, or other time period based on good engineering practice that has been approved in advance by the District. The start-up period begins with the turbine's initial firing and continues until the unit is in compliance with all applicable emission concentration limits. (Basis: Cumulative increase)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-21 Turbine Shutdown: The owner/operator shall operate the gas turbines so that the duration of a shutdown does not exceed 30 minutes per event, or other time period based on good engineering practice that has been approved in advance by the District. Shutdown begins with the initiation of the turbine shutdown sequence and ends with the cessation of turbine firing.
(Basis: Cumulative increase)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-22 Mass Emission Limits: The owner/operator shall operate the LECEF so that the mass emissions from the S-1, S-2, S-3 & S-4 Gas Turbines and S-7, S-8, S-9, & S-10 HRSGs do not exceed the daily and annual mass emission limits specified below. The owner/operator shall implement process computer data logging that includes running emission totals to demonstrate compliance with these limits so that no further calculations are required.

Mass Emission Limits (Including Gas Turbine Start-ups and Shutdowns)

Pollutant	Each Turbine/HRSG Power Train (lb/day)	All 4 Turbine/HRSG Power Trains (lb/day)	All 4 Turbine/HRSG Power Trains (ton/yr)
NO_x (as NO_2)	252.4	1,009.6	99
POC	80.2	320.8	28.3
CO	419.6	1,678.4	98.6
SO_x (as SO_2)	41.6	166.4	8.4
PM10	60	240	43.8
NH_3	198	792	118

The daily mass limits are based upon calendar day per the definitions section of the permit conditions. The annual mass limit is based upon a rolling 8,760-hour period ending on the last hour. Compliance shall be based on calendar average one-hour readings through the use of process monitors (e.g., fuel use meters), CEMS, source test results, and the monitoring, recordkeeping and reporting conditions of this permit. If any part of the CEM involved in the mass emission calculations is inoperative for more then three consecutive hours of plant operation, the mass data for the period of inoperation shall be

calculated using a District-approved alternate calculation method. (Basis: cumulative increase, recordkeeping)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-23 Sulfuric Acid Mist Limit: The owner/operator shall operate the LECEF so that the sulfuric acid mist emissions (SAM) from S-1, S-2, S-3, S-4, S-7, S-8, S-9, and S-10 combined do not exceed 7 tons totaled over any consecutive four quarters. (Basis: PSD)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-24 Operational Limits: In order to comply with the mass emission limits of this rule, the owner/operator shall operate the gas turbines and HRSGs so that they comply with the following operational limits:

a. Heat input limits (Higher Heating Value):

	Each Gas Turbine w/o Duct Burner	Each Gas Turbine w/Duct Burner	Four Turbine/HRSGs Power Trains combined
Hourly:	500 MMBtu/hr	639 MMBtu/hr	--
Daily:	11,342 MMBtu/day	15,336 MMBtu/day	--
Yearly:	--	--	18,215,000 MMBtu/year

b. Only PUC-Quality natural gas (General Order 58-a) shall be used to fire the gas turbines and HRSGs. The total sulfur content of the natural gas shall not exceed 1.0 gr/100 scf.

c. The owner/operator of the gas turbines and HRSGs shall demonstrate compliance with the daily and annual NO_x and CO emission limits listed in **AQ-22** by maintaining running mass emission totals based on CEM data. (Basis: Cumulative increase)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-25 Monitoring Requirements: The owner/operator shall ensure that each gas turbine/HRSG power train complies with the following monitoring requirements:

a. The gas turbine/HRSG exhaust stack shall be equipped with permanent fixtures to enable the collection of stack gas samples consistent with EPA test methods.
b. The ammonia injection system shall be equipped with an operational ammonia flowmeter and injection pressure indicator accurate to plus or minus five percent at full scale and shall be calibrated at least once every twelve months.
c. The gas turbine/HRSG exhaust stacks shall be equipped with continuously recording emissions monitor(s) for NOx, CO and O_2. Continuous emissions

monitors shall comply with the requirements of 40 CFR Part 60, Appendices B and F, and 40 CFR Part 75, and shall be capable of monitoring concentrations and mass emissions during normal operating conditions and during gas turbine startups and shutdowns.

d. The fuel heat input rate shall be continuously recorded using District-approved fuel flow meters along with quarterly fuel compositional analyses for the fuel's higher heating value (wet basis).

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-26 Source Testing/RATA: Within ninety (90) days of the startup of the gas turbines and HRSGs, and at a minimum on an annual basis thereafter, the owner/operator shall perform a relative accuracy test audit (RATA) on the CEMS in accordance with 40 CFR Part 60 Appendix B Performance Specifications and a source test shall be performed. Additional source testing may be required at the discretion of the District to address or ascertain compliance with the requirements of this permit. The written test results of the source tests shall be provided to the District within thirty days after testing. A complete test protocol shall be submitted to the District no later than 30 days prior to testing, and notification to the District at least ten days prior to the actual date of testing shall be provided so that a District observer may be present. The source test protocol shall comply with the following: measurements of NOx, CO, POC, and stack gas oxygen content shall be conducted in accordance with ARB Test Method 100; measurements of PM10 shall be conducted in accordance with ARB Test Method 5; and measurements of ammonia shall be conducted in accordance with Bay Area Air Quality Management District test method ST-1B. Alternative test methods, and source testing scope, may also be used to address the source testing requirements of the permit if approved in advance by the District. The initial and annual source tests shall include those parameters specified in the approved test protocol, and shall at a minimum include the following:

a. NO_x – ppmvd at 15% O_2 and lb/MMBtu (as NO_2)
b. Ammonia – ppmvd at 15% O_2 (Exhaust)
c. CO – ppmvd at 15% O_2 and lb/MMBtu (Exhaust)
d. POC – ppmvd at 15% O_2 and lb/MMBtu (Exhaust)
e. PM10 – lb/hr (Exhaust)
f. SO_x – lb/hr (Exhaust)
g. Natural gas consumption, fuel High Heating Value (HHV), and total fuel sulfur content
h. Turbine load in megawatts
i. Stack gas flow rate (DSCFM) calculated according to procedures in U.S. EPA Method 19
j. Exhaust gas temperature (°F)
k. Ammonia injection rate (lb/hr or moles/hr)
l. Water injection rate for each turbine at S-1, S-2, S-3, & S-4
(Basis: source test requirements & monitoring)

Verification: At least 30 days prior to the date of each source test, the owner/operator shall submit a source test protocol to the District and the CPM for approval. At least 10 days prior to the testing date, the owner/operator shall notify the District and the CPM of the date of the source test. No more than 30 days after the date of the source test, the owner/operator shall submit the results of the RATA and source test to the District and the CPM for approval.

AQ-27 Within 60 days of start-up of the LECEF in combined-cycle configuration and on a semi-annual basis thereafter, the owner/operator shall conduct a District approved source test on exhaust points P-1, P-2, P-3, and P-4 while each Gas Turbine/HRSG power train is operating at maximum load to demonstrate compliance with the SAM emission limit specified in **AQ-23**. The owner/operator shall test for (as a minimum) SO_2, SO_3 and SAM. After acquiring one year of source test data on these units, the owner/operator may petition the District to switch to annual source testing if test variability is acceptably low as determined by the District.
(Basis: PSD Avoidance, SAM Periodic Monitoring)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-28 The owner/operator shall prepare a written quality assurance program must be established in accordance with 40 CFR Part 75, Appendix B and 40 CFR Part 60 Appendix F. (Basis: continuous emission monitoring)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-29 The owner/operator shall comply with the applicable requirements of 40 CFR Part 60 Subpart GG, excluding sections 60.334(a) and 60.334(c)(1). The sulfur content of the natural gas fuel shall be monitored in accordance with the following custom schedule approved by the USEPA on August 14, 1987:

a. The sulfur content shall be measured twice per month for the first six months of operation.
b. If the results of the testing required by **AQ-29a** are below 0.2% sulfur by weight, the sulfur content shall be measured quarterly for the next year of operation.
c. If the results of the testing required by **AQ-29b** are below 0.2% sulfur by weight, the sulfur shall be measured semi-annually for the remainder of the permit term.
d. The nitrogen content of the fuel gas shall not be monitored in accordance with the custom schedule. (Basis: NSPS)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-30 The owner/operator shall notify the District of any breakdown condition consistent with the District's breakdown regulations. (Basis: Regulation 1-208)

Verification: The project owner/operator shall provide duplicate notification to the CPM of all breakdown notifications provided to the District, as required by District breakdown regulations. The duplicate notification shall be submitted to the CPM at the same time it is submitted to the District. The project owner/operator shall also include all breakdown reports for each quarter as part of the quarterly report required by Condition of Certification **AQ-34**.

AQ-31 The owner/operator shall notify the District in writing in a timeframe consistent with the District's breakdown regulations following the correction of any breakdown condition. The breakdown condition shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the actions taken to restore normal operations. (Basis: Regulation 1-208)

Verification: The project owner/operator shall provide duplicate notification to the CPM of all breakdown notifications provided to the District, as required by District breakdown regulations. The duplicate notification shall be submitted to the CPM at the same time it is submitted to the District. The project owner/operator shall also include all breakdown reports for each quarter as part of the quarterly report required by Condition of Certification **AQ-34**.

AQ-32 Recordkeeping: The owner/operator shall maintain the following records. The format of the records is subject to District review and approval:

a. hourly, daily, quarterly and annual quantity of fuel used and corresponding heat input rates
b. the date and time of each occurrence, duration, and type of any startup, shutdown, or malfunction along with the resulting mass emissions during such time period
c. emission measurements from all source testing, RATAs and fuel analyses
d. daily, quarterly and annual hours of operation
e. hourly records of NO_x and CO emission concentrations and hourly ammonia injection rates and ammonia/NO_x ratio
f. for the continuous emissions monitoring system; performance testing, evaluations, calibrations, checks, maintenance, adjustments, and any period of non-operation of any continuous emissions monitor

(Basis: record keeping)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-33 The owner/operator shall maintain all records required by this permit for a minimum period of five years from the date of entry and shall make such records readily available for District inspection upon request.
(Basis: record keeping)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-34 Reporting: The owner/operator shall submit to the District a written report for each calendar quarter, within 30 days of the end of the quarter, which shall include all of the following items:

a. Daily and quarterly fuel use and corresponding heat input rates
b. Daily and quarterly mass emission rates for all criteria pollutants during normal operations and during other periods (startup/shutdown, breakdowns)
c. Time intervals, date, and magnitude of excess emissions
d. Nature and cause of the excess emission, and corrective actions taken
e. Time and date of each period during which the CEM was inoperative, including zero and span checks, and the nature of system repairs and adjustments
f. A negative declaration when no excess emissions occurred
g. Results of quarterly fuel analyses for HHV and total sulfur content.
(Basis: recordkeeping & reporting)

Verification: The owner/operator shall submit to the District and the CPM for approval, written reports for each calendar quarter, within thirty (30) days of the end of the quarter. Each quarterly report will also include, at a minimum, all required compliance documentation for the following conditions: AQ-12, 13, 19, 20, 21, 22, 23, 24, 27, 30, 31, 36, 37, 39, 40, 46, and 47. The report submitted in January of each year shall include an annual summary of the four quarterly reports of the preceding year.

AQ-35 Emission Offsets: The owner/operator shall provide 7.3 tons of valid POC emission reduction credits prior to the issuance of the Authority to Construct. The owner/operator shall deliver the ERC certificates to the District Engineering Division at least ten days prior to the issuance of the authority to construct. (Basis: Offsets)

Verification: At least 10 days prior to the issuance of the ATC, the project owner/operator shall submit all necessary ERC certificates to the District and provide copies of all documentation to the CPM at the same time.

AQ-36 District Operating Permit: The owner/operator shall apply for and obtain all required operating permits from the District in accordance with the requirements of the District's rules and regulations.
(Basis: Regulations 2-2 & 2-6)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-37 Title IV and Title V Permits: The owner/operator must deliver applications for the Title IV and Title V permits to the District prior to first-fire of the turbines. The owner/operator must cause the acid rain monitors (Title IV) to be certified within 90 days of first-fire. (Basis: BAAQMD Regulation 2, Rules 6 & 7)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-38 *Deleted*

Verification: *Deleted*

AQ-39 The owner/operator shall insure that the S-5 Fire Pump Diesel Engine is fired exclusively on diesel fuel with a maximum sulfur content of 0.05% by weight. (Basis: TRMP, cumulative increase)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-40 The owner/operator shall operate the S-5 Fire Pump Diesel Engine for no more than 100 hours per year or 45 minutes per day for the purpose of reliability testing and non-emergency operation.
(Basis: cumulative increase, Regulation 9-8-231 & 9-8-330)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-41 The owner/operator shall equip the S-5 Fire Pump Diesel Engine with a non-resettable totalizing counter that records hours of operation. (Basis: BACT)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-42 The owner/operator shall maintain the following monthly records in a District-approved log for at least 5 years and shall make such records and logs available to the District upon request:

a. Total number of hours of operation for S-5
b. Fuel usage at S-5
(Basis: BACT)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-43 The owner/operator shall operate the facility such that maximum calculated annual toxic air contaminant emissions (pursuant to **AQ-44**) from the gas turbines and HRSGs combined (S-1, S-2, S-3, S-4, S-7, S-8, S-9, and S-10) do not exceed the following limits:

6490 pounds of formaldehyde per year
3000 pounds of acetaldehyde per year
3.2 pounds of Specified polycyclic aromatic hydrocarbons (PAHs) per year
65.3 pounds of acrolein per year

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The

owner/operator may request that the District and CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (Basis: TRMP)

Verification: See Condition of Certification **AQ-44**.

AQ-44 To demonstrate compliance with **AQ-43**, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions for the compounds specified in **AQ-43** using the maximum heat input of 18,215,000 MMBtu/year and the highest emission factor (pound of pollutant per MMBtu) determined by any source test of the S-1, S-2, S-3 & S-4 Gas Turbines and S-7, S-8, S-9, and S-10 HRSGs. If this calculation method results in an unrealistic mass emission rate the applicant may use an alternate calculation, subject to District approval. (Basis: TRMP)

Verification: Within 60 days of the completion of any health risk assessment, the owner/operator shall submit a complete report to the District and the CPM for review.

AQ-45 Within 60 days of start-up of the Los Esteros Critical Energy Facility and on a biennial (once every two years) thereafter, the owner/operator shall conduct a District-approved source test at exhaust point P-1, P-2, P-3, or P-4 while the Gas Turbines are at maximum allowable operating rates to demonstrate compliance with **AQ-43**. If three consecutive biennial source tests demonstrate that the annual emission rates for any of the compounds listed above calculated pursuant to **AQ-43** are less than the BAAQMD Toxic Risk Management Policy trigger levels shown below, then the owner/operator may discontinue future testing for that pollutant.

Formaldehyde	<	132 lb/yr
Acetaldehyde	<	288 lb/yr
Specified PAHs	<	0.18 lb/yr
Acrolein	<	15.6 lb/yr

(Basis: BAAQMD 2-1-316, TRMP)

Verification: At least 20 days prior to the intended source test date, the owner/operator shall submit a source testing methodology to the District and CPM for review and approval. Within 30 days of the source testing date, all test results shall be submitted to the District and the CEC CPM.

AQ-46 The owner/operator shall properly install and maintain the cooling towers to minimize drift losses. The owner/operator shall equip the cooling towers with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 10,000 ppmw (mg/l). The owner/operator shall sample and test the cooling tower water at least once per day to verify compliance with this TDS limit. (Basis: BACT, cumulative increase)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-47 The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the combined-cycle Los Esteros Critical Energy Facility, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in accordance with the manufacturer's design and specifications. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM10 emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in **AQ-46**. The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in **AQ-46**. (Basis: BACT, cumulative increase)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in the fourth quarter report of each year required by Condition of Certification **AQ-34**.

APPENDIX A

Emissions Reduction Credit requirement, based on applicant comments on the District's Revised Preliminary Determination of Compliance.

Condition of Certification AQ-SC7
Required Emission Reduction Credits

ERC Number	Source Location (City)	Date Banked	Source Type	NO_x (tpy)	POC (tpy)
724	Palo Alto	3/13/96	Cardinal Cogen.	7.100	0
856	San Pablo	4/23/02	Myers Container	0	26.522
#896	San Francisco	9/30/85	Potrero Power Plant	304.594	-
			Total ERC Available	**311.694**	**26.522**
			Los Esteros Phase 2 ERC Requirement	**27.945**	**7.500**

Source: Sierra 2005b, pg. 2

ACRONYMS

AQCMM	Air Quality Construction Mitigation Manager
AQCMP	Air Quality Construction Mitigation Plan
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District (also: District)
BACT	Best Available Control Technology
bhp	brake horse power
CEC	California Energy Commission (or Energy Commission)
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CPM	(CEC) Compliance Project Manager
DLN	Dry Low NO_x (combustors)
ERC	Emission Reduction Credit
FDOC	Final Determination Of Compliance
gr	Grains (1 gr $\cong$ 0.0648 grams)
HRSG	Heat Recovery Steam Generator
ISCST3	Industrial Source Complex Short Term, version 3
LECEF	Los Esteros Critical Energy Facility
MMBtu	Million British thermal units
MW	Megawatts (1,000,000 Watts)
NH_3	Ammonia
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen *or* Nitrogen Oxides
NSR	New Source Review
OC	Oxidation Catalyst
PDOC	Preliminary Determination Of Compliance
PM10	Particulate Mater under 10 microns in diameter
POC	Precursor Organic Compounds
ppm	Parts Per Million
ppmv	Parts Per Million by Volume
ppmvd	Parts Per Million by Volume, Dry
PSA	Preliminary Staff Assessment (this document)
PSD	Prevention of Significant Deterioration
scf	Standard Cubic Feet
RPDOC	Revised Preliminary Determination of Compliance
SCR	Selective Catalytic Reduction
SO_2	Sulfur Dioxide
SO_3	Sulfate
SO_x	Oxides of Sulfur
U.S. EPA	United States Environmental Protection Agency

REFERENCES

BAAQMD 2004a (Bay Area Air Quality Management District). Preliminary Determination of Compliance. September 28, 2004.

BAAQMD 2004b (Bay Area Air Quality Management District). Notice Inviting Written Public Comment on the PDOC for Los Esteros Critical Energy Facility. October 29, 2004.

BAAQMD 2004c (Bay Area Air Quality Management District). Letter to Mr. Michael Tollstrup (ARB) from Jack P. Broadbent (BAAQMD). Los Esteros Critical Energy Facility, BAAQMD Application 8859. November 16, 2004.

BAAQMD 2005a (Bay Area Air Quality Management District). Revised Preliminary Determination of Compliance. March 14, 2005.

BAAQMD 2005b (Bay Area Air Quality Management District). Final Determination of Compliance. Expected: May 2005.

ARB 2004 (California Air Resources Board). Letter to Mr. Jack P. Broadbent from Peter Venturini. December 6, 2004.

CEC 2001 (California Energy Commission). Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC 2002a (California Energy Commission). Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC 2002b (California Energy Commission). Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. July 2, 2002.

CEC 2004a (California Energy Commission). Letter to Mr. Jack P. Broadbent (BAAQMD) from Roger E. Johnson (CEC), Re: Los Esteros Critical Energy Facility Preliminary Determination of Compliance Combined Cycle Conversion (Phase 2). December 3, 2004.

CEC 2005a (California Energy Commission). Letter to Mr. Jack P. Broadbent (BAAQMD) from Paul Richins (CEC); Re: Los Esteros Critical Energy Facility, Revised Preliminary Determination of Compliance, Combined Cycle Conversion (Phase 2). April 25, 2005.

EPA 2005a (United States Environmental Protection Agency). Letter to Mr. Brian Bateman (BAAQMD) from Gerardo C. Rios (U.S. EPA), RE: Los Esteros Critical Energy Facility, Revised Preliminary Determination of Compliance. April 29, 2005.

LECEF 2003 (Los Esteros Critical Energy Facility, LLC). Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF 2004a (Los Esteros Critical Energy Facility, LLC). Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF 2004b (Los Esteros Critical Energy Facility, LLC). Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

Sierra 2004a (Sierra Research). Gary Rubenstein letter to Steve Hill, Manager, Permit Evaluation, Bay Area Air Quality Management District, regarding PM10 and SO_2 permit limits for LECEF Phase 1. June 1, 2004.

Sierra 2004b (Sierra Research). Letter to Dennis Jang (BAAQMD) from Gary Rubenstein (Sierra Research), Re: Preliminary Determination of Compliance for Los Esteros Critical Energy Facility. November 30, 2004.

Sierra 2005a (Sierra Research). Letter to Dennis Jang (BAAQMD) from Gary Rubenstein (Sierra Research), Re: Revised Preliminary Determination of Compliance for Los Esteros Critical Energy Facility, BAAQMD Application 8859. April 4, 2005.

Sierra 2005b (Sierra Research). Letter to Dennis Jang (BAAQMD) from Gary Rubenstein (Sierra Research), Re: Emission Reduction Credits to be Surrendered for Los Esteros Critical Energy Facility, BAAQMD Application 8859. May 5, 2005.

SVP 2002 (Silicon Valley Power). Application for Certification for the Pico Power Project. October 7, 2002.

CH2MHill 2004 (CH2MHill). Cumulative Air Quality Impact Analysis, Los Esteros Critical Energy Facility, Phase 1 Relicense and Phase 2 Combined-Cycle Conversion (03-AFC-02). May 18, 2004.

BIOLOGICAL RESOURCES

Testimony of Natasha Nelson

INTRODUCTION

This section provides the California Energy Commission staff's analysis of potential impacts to biological resources from Calpine's (applicant's) proposal for the construction and operation of the Los Esteros Critical Energy Center (LECEF) as a combined cycle facility; staff has analyzed the impacts of construction and operation of the simple-cycle facility separately. This analysis is primarily directed toward impacts to state- and federally-listed species, species of special concern, wetlands, and other areas of critical biological concern. This document presents information regarding the affected biotic community, the potential environmental impacts associated with the construction and operation of the proposed project, and where necessary, specifies mitigation and compensation measures to reduce potential impacts to non-significant levels. This document also determines compliance with applicable laws, ordinances, regulations, and standards (LORS), and specifies conditions of certification.

This analysis is based, in part, on information provided on December 30, 2003, from Calpine's Application For Certification (LECEF LLC. 2003), Calpine's supplement to Data Adequacy submitted March 17, 2004 (LECEF LLC. 2004a), Calpine's responses to staff's April 1, 2004 Data Requests submitted on April 30, 2004 (LECEF LLC. 2004b), discussions with U.S. Fish and Wildlife Service (USFWS) and with California Department of Fish and Game (CDFG). In addition to the current Application for Certification (AFC), staff has reviewed the Commission Decision for the original LECEF (01-AFC-12) dated July 2002, the Staff Assessment for that AFC dated December 31, 2001 and the Staff Assessment Supplement dated February 5, 2002. The LECEF site has been the subject of two previous Environmental Impact Reports (EIRs); the analyses and mitigation found in the *City of San Jose: U.S. DataPort Draft and Final EIR* (City of San Jose 2001) and the *California Public Utilities Commission: Northeast San Jose Reinforcement Project EIR* (CPUC 2000) were used in preparing this testimony. Staff reviewed Commission Decisions, staff analyses, and applicant submittals on nitrogen deposition from LECEF (01-AFC-12), Metcalf Energy Center (MEC) (99-AFC-13), and Pico Power Project (02-AFC-3). Staff also had access to the Preliminary Determination of Compliance (PDOC) and the revised PDOC from the Bay Area Air Quality Management District (Jang 2004, Jang 2005) and Calpine's comments on the PDOC (Sierra Research 2005).

LAWS, ORDINANCES, REGULATION AND STANDARDS

The applicant will need to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

FEDERAL

Clean Water Act of 1977

Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26), prohibits the discharge of dredged or fill material into the waters of the United States without a permit.

Endangered Species Act of 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designates and provides protection of threatened and endangered plant and animal species, and their critical habitat.

Migratory Bird Treaty Act

Title 16, United States Code, sections 703-712, prohibit the take of migratory birds.

STATE

California Endangered Species Act of 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered plant and animal species.

Nest or Eggs-Take, Possess, or Destroy

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

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

Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

Migratory Birds-Take or Possession

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

Fully Protected Species

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

Significant Natural Areas

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

Native Plant Protection Act of 1977

Fish and Game Code section 1900 et seq. protects state rare, threatened, and endangered plants.

California Code of Regulations

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

Santa Clara County General Plan- 1995 to 2010

Policy R-RC 19 requests that habitat types and biodiversity be maintained and enhanced. Policy R-RC 24 requests that areas of particularly fragile ecological nature necessary for preserving threatened or endangered species receive special consideration for preservation and protection from development impacts. Policy R-RC 37 requests that lands near creeks, streams, and freshwater marshes shall be considered to be in a protected buffer area. Policy R-RC 38 states that buildings, structures, and parking lots are not allowed in the buffers defined in R-RC 37, exceptions being those minor structures required as part of flood control projects.

City of San Jose 2020 General Plan

Woodlands, Grasslands, Chaparral, and Scrub Policies

Number 8: Serpentine grasslands should be preserved and protected to the greatest extent feasible or appropriate measures should be taken to restore or compensate.

Bay and Baylands Policies

Number 5: The City should continue to participate in the Santa Clara Valley Non-Point Source Pollution Control Program and meet regional water quality standards implemented through the National Pollution Discharge Elimination System Permits.

Species of Concern Policies

Number 1: Consideration should be given to setting aside conservation areas in the Bay and baylands, along riparian corridors, upland wetlands, and hillside areas to protect habitats of unique, threatened, and endangered species.

Number 2: Habitats that support Species of Concern should be retained to the greatest extent feasible.

Urban Forest Policies

Number 8: Where urban development occurs adjacent to natural plant communities (e.g. riparian forest), landscape plantings should incorporate tree species native to the area to the greatest extent feasible.

Coyote Valley Specific Plan

The City Council for City of San Jose initiated this Specific Plan in 2002 and it is still a work in progress. It plans land uses in detail, determines infrastructure and community services, formulates financing and implementation programs, and phases the implementation of any of the plan elements as necessary. Coyote Valley Specific Plan is being carefully coordinated with the various wildlife agencies.

City of San Jose Riparian Corridor Policy

Guideline 1C: Setback Areas

All buildings, other structures, impervious surfaces, outdoor activity areas, and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater). Exceptions to the 100-foot setback may be considered for certain circumstances, including utility or equipment installations which involve no significant disturbance to the riparian corridor during construction and operation, and generate only incidental human activity.

Guideline 2C: Visual and Guideline 2E: Lighting

Development projects should be designed to minimize potential impacts to adjacent riparian habitat through the use of environmentally sensitive construction materials/activities, specialized lighting features, and native landscaping.

Guideline 2f: Noise

The operation of mechanical equipment within or adjacent to riparian corridors should not exceed noise levels for open space as specified in the Noise Element of the City of San Jose's General Plan. Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.

Guideline 6D: Herbicides

Herbicide use within and adjacent to riparian corridors should be limited to those specifically labeled for use adjacent to water courses.

Guideline 7B: Water Quality/Drainage and Runoff

The direct discharge of industrial effluent into the riparian channel, corridor, or floodplain is prohibited. Runoff from industrial uses should not enter the riparian corridor, or Best Management Practices should be provided and permanently maintained and on-site retention areas used.

Ordinance-sized Trees and Heritage Trees

City of San Jose Civil Code, Titles 13.28.330-13.28.360 define and protect Heritage Trees. Title 13.31.010 to 13.32.100 prohibits the removal of trees that are 56 inches or greater at 24 inches above the natural grade or slope without a permit.

Ordinance 26248 - Lighting

City of San Jose Municipal Code (Part 5) states any lighting located adjacent to riparian areas shall be directed downward and away from riparian areas.

SETTING

REGIONAL

The LECEF project site is located within the City of San Jose, in Santa Clara County, just west of the town of Milpitas. The project area is bounded by the Santa Clara Valley to the south, the Diablo Range to the east, the Santa Cruz Mountains to the west and San Francisco Bay to the north. Existing land use types in San Jose and Santa Clara County include residential, commercial, industrial, agriculture, and open space. Habitats present in the region are identified as Northern Coastal Salt Marsh, Northern Coastal Brackish Marsh, Seasonal Wetland, Central Coast Cottonwood-Sycamore Riparian Forest, Non-Native Annual Grassland, Alkali Grassland, Agricultural Areas, and Developed Areas.

Marshlands generally occur to the north and west of the project site, transitioning from sewage disposal ponds to salt evaporators, to the marshlands of the bay approximately eight miles northwest of the site. Seasonal wetlands occur along Coyote Creek (700 feet to the east) in a bypass channel and at the upper edges of the marsh zones. Riparian corridors occur at Coyote Creek and the Guadalupe River (two miles west).

Several plant and animal species listed under state and/or federal Endangered Species Acts are known to inhabit the project region. For a complete list of sensitive species actually observed and with a potential to occur in the project site region, refer to Table 8.2-1 in the AFC (LECEF LLC. 2003). A summary of the species most likely to be observed is provided in **BIOLOGICAL RESOURCES Table 1**. Several plant and animal species considered as sensitive or listed under state and/or federal Endangered Species Acts are identified as endemic (restricted) to serpentine soils in Santa Clara County (refer to **BIOLOGICAL RESOURCES Table 2**). The most biologically sensitive areas are just south of San Jose along the Highway 101 corridor. The areas known as Coyote Ridge and Tulare Hill can be found here.

Critical Habitat

Early in 2001, the USFWS designated approximately 24,000 acres of habitat in fifteen Critical Habitat Units within San Mateo and Santa Clara Counties as critical for the survival of the bay checkerspot butterfly (USFWS 2001c) which depends on host plants growing on serpentine soils. Each of the fifteen Critical Habitat Units has an individual butterfly population that is for the most part isolated from other populations, and when the populations are spoken of collectively they will be called a “meta population.” The two closest Critical Habitat Units to the LECEF are Communications Hill (Unit 6) and Silver Creek (Unit 12). Communications Hill covers 443 acres of mostly undeveloped land and is approximately 6 miles south of LECEF. Although recent surveys have not detected the butterfly on the hill, the USFWS believes this Unit functions as habitat for the butterfly, more precisely it acts as a “stepping stone” to other suitable areas. It also represents the most northwestern remnants in the Santa Clara metapopulation.

BIOLOGICAL RESOURCES TABLE 1
Special Status Species With Potential to be Observed on the LECEF Site or on Contiguous Parcels (Table 8.2-1, LECEF LLC. 2003)

Species Name	Regulatory Status[#]	Suitable Habitat for the Species	Occurrences In Project Area
LECEF Site or Contiguous Parcels			
Loggerhead shrike *Lanius ludovicianus*	SC, CSC	Annual grassland, Riparian habitat along Coyote Creek	Species observed in 2002 near Zanker Road. Potential suitable foraging and nesting habitat in landscape area (outside of fence).
Northern harrier *Circus cyanus*	CSC	Wetland habitat; fresh and/or brackish, Cropland, Annual grassland	Species observed foraging over project site. Suitable foraging and potential nesting habitat in landscape area (outside of fence) and adjacent parcels.
White-tailed kite *Elanus leucurus*	SC, FP	Annual grassland; Riparian habitat along Coyote Creek	Species observed perching, foraging and nesting adjacent to project site. Potential for nesting in trees adjacent to site and within the Coyote Creek riparian corridor.
Western burrowing owl *Athene cunicularia*	SC, CSC	Annual grassland, Oak Woodland	Species known to occur in the vicinity of project site. Potential suitable foraging and nesting habitat in landscape area (outside of fence) and on adjacent lands.
Yuma myotis bat *Myotis yumanensis*	SC, CSC	Riparian habitat along Coyote Creek, Chaparral	Species observed foraging and roosting adjacent to project site. Potential suitable foraging habitat on site and potential for foraging and roosting within the Coyote Creek riparian corridor.
Coyote Creek (700 feet east of proposed project)			
Fall-run Chinook salmon *Oncorhynchus tshawytscha*	PE	Ocean, Freshwater streams	Migrate from the ocean to spawning sites in Coyote Creek, about 700 feet from the project site.
Steelhead trout *Oncorhynchus mykiss*	FT	Ocean, Freshwater streams	Migrate from the ocean to spawning sites in Coyote Creek, about 700 feet from the project site.

[#] Federal-, state-, and California Native Plant Society (CNPS)-listed species:
FE: Federally Endangered.
FT: Federally Threatened.
SC: Federal Species of Concern.
PE: Federal Proposed Endangered.
PT: Federal Proposed Threatened.
C: Candidate Species for Listing
SE: California Endangered.
ST: California Threatened.
CPE: California Proposed Endangered.
CSC: California Species of Special Concern.
FP: California Fully-Protected species.
CR: California Rare.
CNPS List 1A: Extinct.
CNPS List 1B: Rare or endangered in California and elsewhere.
CNPS List 2: Rare or endangered in California, more common elsewhere.

BIOLOGICAL RESOURCES Table 2
Special Status Species found on Serpentine Soils
In Santa Clara County
(USFWS 1998)

Species	Regulatory Status[#]	Distribution and Life History
Plants		
Santa Clara Valley dudleya *Dudleya setchellii*	FE, CNPS 1B	Several occurrences from San Jose south to the City of San Martin (20 km along Hwy. 101); restricted to rocky outcrops within serpentine grasslands.
Smooth lessingia *Lessingia micradenia var. glabrata*	SC, CNPS 1B	Endemic to the east side of the Santa Cruz Mountains in Santa Clara County; grows on serpentine soils or outcrops.
Coyote ceanothus *Ceanothus ferrisae*	FE, CNPS 1B	Suitable habitat at Anderson Dam, Kirby Canyon, and City of Morgan Hill; grows on dry slopes in serpentine chaparral and valley and foothill grasslands below 300 meters.
Metcalf Canyon jewel-flower *Streptanthus albidus ssp. albidus*	FE, CNPS 1B	Occurrences from San Jose south to Anderson Lake (30 km); endemic to serpentine outcrops.
Mt. Hamilton thistle *Cirsium fontinale var. campylon*	SC, CNPS 1B	Several occurrences in Santa Clara County and other counties; found in serpentine seeps.
Tiburon paintbrush *Castilleja affinis* ssp. *neglecta*	FE, ST, CNPS 1B	Occurs in serpentine bunchgrass communities in Marin, Napa, and Santa Clara counties. Less than 20 plants are in Santa Clara County.
Most beautiful jewel-flower *Streptanthus albidus ssp. peramoenus*	SC, CNPS 1B	On the ridges of Santa Clara County and elsewhere; grows between 140 and 700 meters in elevation on serpentine outcrops or ridges and slopes in chaparral and valley foothill grassland.
Invertebrates		
Opler's longhorn moth *Adela oplerella*	SC	Nine populations in Santa Clara County, but also occurs throughout the greater San Francisco Bay area. Habitat restricted to its exclusive host plant, California cream cups (*Platystemon californicus*).
Bay checkerspot butterfly *Occidryas editha ssp. bayensis*	FT	Habitat now limited and patchily distributed in several counties; the four core areas on Coyote Ridge provide a reservoir critical to the survival of the Santa Clara County metapopulation; all habitat is on shallow, serpentine-derived or similar soils which support the butterfly's larval food plants.

[#] See footnote for BIOLOGICAL RESOURCES Table 1.

The Coyote Valley Specific Plan has between 2,500 and 4,000 new residential units, additional commercial activities, parks, and schools proposed within the Communication Hill Unit. The Silver Creek Unit includes nearly 1,000 acres of contiguous serpentine soils, other scattered serpentine outcrops, and habitat less suitable for breeding, but needed for nectar-feeding or dispersal. This Unit is approximately 9 miles southwest of LECEF. The Unit includes the non-profit Silver Creek Preserve owned by William Lyon Homes (formerly Presley Homes). A small population of bay checkerspot butterfly has been documented in the Unit, but some areas are in degraded condition. This is the northernmost Unit of the Santa Clara metapopulation.

In March 2001, the USFWS designated four million acres of California as critical habitat for the California red-legged frog (USFWS 2001b). The designation of critical habitat was challenged in court, and the judge ordered an economic analysis be completed before the proposal could be adopted by the USFWS. A new proposal for critical habitat was released in April 2004 with the economic analysis (USFWS 2004), and the comment period closed in July 2004. As of March 2005, no other action has been taken. The California red-legged frog requires both aquatic and upland habitats. The closest Critical Habitat Unit to LECEF is East Bay-Diablo Range (Unit 15), about 8 miles to the east. The East Bay-Diablo Range Unit covers one million acres of watersheds within eight central coast counties. All of Santa Clara County‘s eastern edge is within Unit 15.

In March 2000, the National Marine Fisheries Service (NMFS) designated critical habitat for chinook salmon and steelhead trout (NMFS 2000). These areas include California rivers (including estuarine areas and tributaries) within the range of each listed Evolutionary Significant Unit (ESU). Chinook salmon and steelhead trout require aquatic, freshwater and saltwater habitats. The closest critical habitat for these species is Coyote Creek, about 700 feet to the east of the project site.

Recovery Plans

Fourteen federally listed species and 14 species of concern are included in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). The USFWS Recovery Plan delineates the reasonable actions which are believed to be required to recover and/or protect these species.

The recovery plan for the California red-legged frog was released in May 2002 (USFWS 2002). The goal of the recovery plan is to delist the species by 2025. The project site is within Recovery Unit 4- South and East San Francisco Bay which has several existing populations. The project site is not within any Core Area (areas which allow for the long-term viability of the species). Steps towards recovery include protecting known populations and reestablishing others, protecting habitat, and promoting management actions which stop threats.

LOCAL

LECEF’s project site is located north of State Route 237 (Alviso-Milpitas Road), west of Interstate 880, east of Zanker Road, and south of San Jose/Santa Clara Water Pollution Control Plant‘s wastewater treatment ponds. The property directly to the north includes the Los Esteros Substation built by PG&E (see analysis in the *CPUC: Northwest San*

Jose Reinforcement Project EIR [CPUC 2000]) and the Silicon Valley Power Switching Station. The Silicon Valley Power Switching Station was completed in early December 2004 on a strip of land north of the facility, between LECEF and the PG&E Los Esteros Substation. The agricultural lands to the east (Cilker's property) of the project site are proposed for development as part of the U.S. DataPort build out (City of San Jose 2001). San Jose/Santa Clara Water Pollution Control Plant (WPCP) controls buffer lands to the west of the power plant. The buffer lands are also proposed for the U.S. DataPort build out.

The LECEF site is located approximately 700 feet west of the Coyote Creek Flood Control Project. The Flood Control Project, completed in 1997, consists of a levee wall, approximately 10 feet high and approximately 60 feet wide with an access road on top. Stormwater runoff from the site is pumped to a temporary outfall structure via a 24-inch pipe placed in the levee. Within the next two years, the applicant will construct a permanent outfall inside of the levee. The temporary and permanent outfalls were analyzed under the simple-cycle proceeding and are part of the existing license. The site implements Best Management Practices to reduce pollutants in the stormwater.

Within the flood control levee, Coyote Creek flows in a rock-sided, low-flow channel north to the South San Francisco Bay. Coyote Creek is an area vegetated with typical native riparian vegetation including Fremont cottonwood, red willow, box elder, coast live oak, arroyo willow, western sycamore, and black walnut. Shrub and herbaceous species throughout the riparian corridor include blue elderberry, mulefat, snowberry, California blackberry, poison oak, mugwort, and wild cucumber. Non-native vegetation present along this reach of the creek includes Himalayan blackberry, milk thistle, curly dock, and fumaria. Coyote Creek is a wildlife corridor and contains several hundred species including birds, mammals, amphibians, and reptiles. Several species (including the white-tailed kite, a fully-protected species) have the potential to nest in this area.

LECEF is approximately 1 to 1.5 miles south of the Don Edwards (formally San Francisco Bay) National Wildlife Refuge (NWR). This area is a highly productive, diverse and sensitive marsh habitat devoted to the preservation of salt marsh harvest mouse, nesting and migratory shorebirds, upland birds and mammals, and tidal invertebrates. Several bird species that are found in Don Edwards NWR, such as mallard and American coot, may use adjacent properties as part of their foraging grounds.

Common native bird species observed on the LECEF site and linear routes include the American kestrel, Anna's hummingbird, black phoebe, black-chinned hummingbird, Brewer's blackbird, California towhee, common yellowthroat, lesser goldfinch, mourning dove, northern mockingbird, prairie falcon, red-shouldered hawk, red-tailed hawk, song sparrow, turkey vulture, woodpecker species, western meadowlark, western scrub jay, white-crowned sparrow, and the yellow-rumped warbler. Common native mammals observed include the California ground squirrel and the Yuma myotis bat. For special status species with a potential to be observed on the LECEF site and on contiguous parcels, refer to **BIOLOGICAL RESOURCES Table 1**.

Surveys in 2000 for burrowing owls completed by a consultant (Harvey 2000) found that they were not present east of the power plant, on the Cilker property (also known as the

U.S. DataPort property). The surveys for U.S. DataPort found nearby properties to the west and north of the power plant did have sign of nesting owls (H.T. Harvey 2000). Burrowing owls were observed west of Zanker Road and at a bus maintenance facility, just south of State Route 237 (City of San Jose 2001). Surveys in 2002 for the transmission line and primary access road found a single burrowing owl and an active burrow in the City's WPCP buffer land to the west of the power plant (Santolo 2002). The burrow was destroyed during routine weed control and maintenance by the City of San Jose in 2002 (N. Nelson, personal observation).

Power Plant Site

LECEF's project site is 21 acres in size, enclosed by eight-foot tall cinder-block walls, and the site has been developed into a simple-cycle power plant. The 21-acre site contains power plant equipment and related facilities. The combined cycle elements would be installed within the fence line on areas that are currently graded and compacted, and generally devoid of vegetation.

The simple-cycle facility currently uses a cooling tower and in combined cycle configuration, the power plant will build and operate a second six-cell cooling tower. The two cooling towers would be built to eliminate nearly all drift off-site and will be inspected annually to ensure compliance (see Air Quality, Conditions of Certification AIR- 46 and AIR-47). Overall, the amounts of salt that could accumulate on the nearby agricultural areas are below the threshold which could cause vegetative harm (Section 8.2.3, LECEF LLC. 2003).

The cooling and process water supply for the project will be reclaimed water provided by the WPCP plant and wastewater disposal will be conveyed to the City of San Jose sewer system for treatment at the WPCP. The amount of water used by the power plant and returned for treatment is a very small percentage of the WPCP capacity.

The City of San Jose Tree Removal Controls serve to protect all trees having a trunk measuring 56 inches or more in circumference (18 inches in diameter) at the height of 24 inches above the natural grade of slope. The ordinance protects both native and non-native species. No trees meeting the definition of significant remain on the power plant site. No heritage trees are on the power plant site.

Linear Facilities

The linear facilities for the combined cycle plant were built under the existing permit. Areas of disturbance were restored and the only potential for continued disturbance occurs along the primary access road, Thomas Foon Chew Way. Thomas Foon Chew Way crosses west-east from Zanker Road to just north of Alviso-Milpitas Road and State Route 237. This paved road is approximately 10 feet in width and 2,700 feet in length. The easement upon which the road is built varies between 30- and 40-feet in width.

The area north of the primary access road, Thomas Foon Chew Way, contains small trees, agricultural land, and agricultural land reverted to disturbed grassland (with ruderal species). Such habitat has the potential to provide nesting, foraging, and roosting habitat for several raptor species mentioned above under the Power Plant

section. South of the primary access road, the power plant has a long-term lease on 6.2 acres of land and has built a 2.2-acre berm. The berm is planted in oak trees and acts as a visual screen in compliance with Condition of Certification **VIS-7**. The 6.2 acres has been designated by the applicant as a burrowing owl management area and is maintained in short grasses and annual vegetation beneath the oaks.

Worker Parking and Staging Areas

The 13-acre parcel south of the project site has been recently graded and is partially enclosed with chainlink fence. Vegetation communities on the parcel have been lost at the present time, but could revegetate if the construction is delayed for several years. Wildlife species with the potential to occur on the parcel are the same as those observed at the power plant site (see **BIOLOGICAL RESOURCES Table 1**).

ANALYSIS AND IMPACTS

Projects in developed areas typically have less of an impact on sensitive biological resources because of the lack of suitable habitat on site. However, such projects are evaluated for the indirect impacts they could have on any surrounding areas that remain in natural conditions and support biological resources. Staff evaluated several impacts associated with the proposed project including:

- potential bird collisions with the facility elements;
- vehicle collisions with wildlife along the primary access road;
- temporary loss of upland foraging habitat from the worker parking and staging areas;
- degradation of serpentine areas from nitrogen deposition;
- water quality degradation to Coyote Creek due to stormwater discharge;
- potential noise and light impacts to Coyote Creek from construction and operation; and,
- potential spread of weeds into riparian areas.

Direct Effects

Power Plant

Bird collisions with exhaust stacks and other tall structures can result in significant bird losses when these structures are located in areas where suitable habitat attracts bird populations. Most bird collisions/deaths occur during migration in inclement weather. The site and immediate surrounding areas do not contain attractive habitat (e.g., freshwater marsh or ponds) for low-flying flocking birds on either side which would create a large "cross-over" effect, increasing the chances of collision. LECEF in simple-cycle configuration has two 90-foot combustion exhaust stacks and all the combined cycle’s elements (such as piping and cooling towers) are all below this elevation. Therefore, addition of combined cycle elements is unlikely to increase bird collisions or otherwise cause harm to wildlife. Therefore, staff concludes that this potential concern is not applicable to LECEF Phase 2, and no mitigation is recommended by staff.

Linear Facilities

Electrical lines were installed to connect the Phase 1 simple-cycle facility's substation to PG&E's Los Esteros Substation-Nortech line to the north. The connection is 152-feet long and consists of three wooden poles. The Phase 2 connection would consist of two new 200-foot circuits to the Silicon Valley Power Switching Station to the north. Impacts to avian species from either attachment are expected to be less than significant because of their short distance and the existence of other infrastructure. There is also an east to west transmission line right-of-way (poles and road) connecting the Phase 1 facility and the PG&E Los Esteros Substation to transmission lines on Zanker Road. The Zanker Road connection is on an existing distribution line and is bordered by State Route 237 to the south and the WPCP's buffer lands to the north. Flights by large flocks of low-flying birds in-between these two features is unlikely. Instead, most species travel north from the WPCP buffer lands to the WPCP treatment ponds or Don Edwards NWR. Thus, the project's transmission line connecting to Zanker Road's transmission lines is unlikely to increase bird electrocutions or collisions.

Primary access to LECEF will be from Thomas Foon Chew Way, within the WPCP buffer lands, west of the site. The construction of the road caused the permanent removal of potential burrowing owl foraging habitat. Widening the primary access road would result in additional direct significant impacts to this species. If road improvements are necessary, then impacts could be mitigated by conditions of certification **BIO-11** and **BIO-19**.

During construction of the combined cycle elements, workers and deliveries will use the primary access road daily. Because the road traverses the burrowing owl management area, the potential for vehicle collisions with owls was evaluated by staff and was determined to be significant if not properly mitigated. During construction, the applicant shall distribute flyers and take actions against project-construction employees or contractors that repeatedly violate the speed limit to reduce the impacts to less than significance (condition of certification **BIO- 20**). During operation, these roads would receive use only by LECEF's plant employees or by SVP and PG&E's substation employees, and no biological impacts are expected.

Worker Parking and Staging Areas

Parking and equipment staging areas required during the site preparation and construction periods would be located south of the power plant parcel. The 13-acres was recently disturbed, and no sensitive species or their habitats were identified on the parcel during surveys. The area can return to more natural conditions if there is a delay in construction of a few years, so pre-construction surveys will be necessary to ensure no sensitive resources have moved onto the site (conditions of certification **BIO-10** and **BIO-11**).

The adjacent properties are consistent with potential nesting and foraging habitat for burrowing owls and the species may move into the area at any time. Impacts to burrowing owls could occur if construction activities occurred near (within a 250-foot buffer) active nests or if foraging habitat next to nesting sites is permanently removed. These types of impacts are typically mitigated by avoidance, and if this cannot be done, then mitigated by acquiring (either by direct purchase or conservation easement)

suitable burrowing owl habitat. Surveys will be performed to verify the presence or absence of this species prior to site mobilization; the survey results will be sent to the CDFG and staff, and mitigation land will be purchased based on the ratios given during the previous proceeding (conditions of certification **BIO-11** and **BIO-19**).

Indirect Effects

Staff evaluated several indirect impacts associated with the proposed LECEF including:

- nitrogen deposition;
- the stormwater discharges and the effluent discharged from the Wastewater Pollution Control Plant;
- noise and light on the sensitive species in adjacent land during construction and operation; and
- the spread of weeds.

Nitrogen Deposition

The operation of the proposed combined cycle facility will emit several air pollutants, including nitrogen dioxide and ammonia, into the atmosphere. These chemical components often react with the atmosphere to form fertilizing agents (HNO_3). Nitrogen deposition is the amount of nitrogen that converts to particulates and accumulates on soil or other surfaces. The modeling of nitrogen deposition is based on several conservative assumptions regarding chemical conversion rates, weather conditions, and minimum loss of mass. Modeling of nitrogen deposition from the proposed combined cycle project estimates that nitrogen deposition would concentrate at the north end of the serpentine range in Santa Clara County (near Silver Creek) and that deposition levels decline in a northwest to southeast direction in relation to distance away from the site and intervening topography. For example, the average nitrogen deposition at the USFWS Silver Creek Critical Habitat Unit is modeled to be 0.0039 kilograms of nitrogen per hectare per year (kg-N/ha-yr) and at the USFWS Kirby Critical Habitat Unit to the southwest, the average deposition is 0.0060 kg-N/ha-yr (Data Response 21, LECEF LLC. 2004b).

The modeling done for the combined cycle analysis assumed background nitrogen deposition in the vicinity of San Jose is 8.4 kg-N/ha-yr (Sierra Research 2000). Recent research completed for Metcalf Energy Center (MEC; 99-AFC-3), also in San Jose, indicated that nitrogen deposition is higher than estimated. Nitrogen deposition at sites north of the power plant had depositional values of 5 to 15 kg-N/ha-yr, while areas south of the power plant, such as Tulare Hill, had depositional values between 10 and 20 kg-N/ha-yr (extrapolated from Attachment BIO-2, Figure 4-11; LECEF LLC. 2004b).

According to the USFWS, potential impacts could occur to the federally-listed Santa Clara Valley dudleya, Metcalf Canyon jewel-flower, Coyote ceanothus, and Tiburon paintbrush as a result of LECEF nitrogen emissions (Martin 2004; **BIOLOGICAL RESOURCES Table 2**). These plant species are serpentine endemics or near endemics, which are limited to small localized areas where conditions give them an advantage over non-native species. The populations of these species are threatened by development pressures in the greater San Jose area, and for some populations,

recreational disturbance or cattle grazing. The Recovery Plan for these species does not identify nitrogen deposition or invasion by non-native grasses (or weeds) as a threat to the Santa Clara County plant populations, but invasions are a threat to a different species of jewel-flower found in nearby Contra Costa County (USFWS 1998). The USFWS has determined nitrogen deposition could stimulate non-native grasses and as a secondary effect the non-native grasses could change the fire regime which ceanothus and paintbrush depend on; or invasions could shade out dudleya and, to some extent the jewel-flower (Goude 2001). The USFWS required management and maintenance actions to improve conditions for the protected dudleya as part of the MEC Biological Opinion (Goude 2001) and proposed LECEF consider habitat conservation or reductions in ambient nitrogen as conservation measures (Martin 2004). Studies thus far have shown changes in small native annual plant populations as a result of non-native grass invasions (Weiss 1999), but no studies could be found on the four federally-listed plants. Protection of land from development as mitigation for cumulative impacts to bay checkerspot butterfly, as proposed under Cumulative Impacts section of this document, may aid three of these plant species because the parcel of land purchased by Calpine is within the range of these plants. But, unless additional fencing was added around all rock outcrops which contain dudleya, the current mitigation parcel would be unsuitable for protection of all four federally-listed plant species because it is grazed for several months of the year (Weiss 1999). During consultation between the applicant and the USFWS in the fall of 2004, the USFWS suggested pro-active conservation measures be proposed in addition to the mitigation land. Such measures could include fencing populations to prevent grazing damage, weeding the area by hand, or otherwise creating favorable conditions for plant growth. Conservation measures together with mitigation land could result in a higher level of protection for these plants. Any such conservation measures would be incorporated into the BRMIMP (Conditions of Certification **BIO-8** and **BIO-18**).

Nitrogen deposition rates considered sufficient to affect ecosystem structure and diversity is 3 to 10 kg-N/ha-yr depending on vegetation type (Fox et al. 1989). Recent air pollution research on Coyote Ridge (which includes the Silver Creek and Kirby Critical Habitat Units) found nitrogen deposition levels are already adversely affecting native serpentine plant communities, with negative effects on the bay checkerspot butterfly (Weiss 1999). So if there are any additional increases in emissions from the combined cycle plant, there would be additional impacts to the butterfly. Staff concludes that the project may have minor effects on the soils that support this serpentine endemic, but proving an indirect impact will occur would be difficult for several reasons:

- The large distance between the source and the area of impact;
- The number of intervening sources of nitrogen in between the source and the area of impact;
- The level of impact when modeled conservatively would be even smaller when typical conditions were assumed; and,
- The trends and changes in ozone pollution from mobile and stationary sources continually alter the expected amount of nitrogen deposition.

Without solid evidence that the amount of nitrogen deposition resulting from the proposed project is causing significant indirect harm, staff is not proposing any

mitigation other than the project should at a minimum use Best Available Control Technologies (BACT) for its NOx emissions to reduce the amount emitted from the proposed project. While the applicant proposed a NOx limit of 2.5 parts per million, the Bay Area Air Quality Management District (BAAQMD) determined that the BACT for NOx at the LECEF Phase II was 2.0 parts per million averaged over one hour. This limit was also required of another power plant in San Jose, the Pico Power Plant (02-AFC-3). However, BAAQMD will allow for occasional excursions at LECEF II because of recent evidence showing rapid load changes increase the emissions above the BACT limit (Jang 2005). The lower limit in everyday operations will decrease the likelihood of impacts to serpentine endemics, and staff supports the BACT decision of the BAAQMD. In the Cumulative Impacts section of this document, staff has evaluated the effects of nitrogen deposition when combined with other sources.

Stormwater and Wastewater Pollution Control Plant Discharges

Runoff from the project site will be collected and discharged into the Coyote Creek by-pass channel. Stormwater from paved areas has the potential to carry a variety of pollutants including grease, oil, and trace amounts of heavy metals and particulates. Stormwater from landscaped areas can carry pesticides, herbicides, and fertilizers. Although the exact amounts of pollutants carried by stormwater to the by-pass channel and eventually to Coyote Creek is unknown, over time, the amount could accumulate. Because of the sensitive resources present, or potentially present in Coyote Creek (see **Biological Resources Table 1**), pollution is a significant impact. Restrictions on herbicides and pesticides within the Landscaping Plan and at the Burrowing Owl Management Area would reduce this impact to less than significant levels (Conditions of Certification **BIO-17** and **BIO-19**). The impact to resources in Coyote Creek would be further minimized after implementation of the City of San Jose Grading Ordinance and specific measures proposed by the applicant (see Soil and Water Resources analysis).

The cooling and process water supply for the project will be recycled water provided by the WPCP and wastewater disposal will be conveyed to the City of San Jose sewer system for treatment at the WPCP. The average and peak influent needs of LECEF in combined cycle are 1.313 million gallons per day (mgd) and 2.95 mgd. LECEF is expected to discharge on average 0.280 mgd and at peak operation 0.615 mgd. This discharge is about twice as much as when the power plant operates as a simple-cycle facility. The largest component of the industrial waste is the cooling tower blowdown, which is discharged after three cycles of concentration to WPCP.

The effluent discharge from the WPCP goes into Artesian Slough on City of San Jose property. Artesian Slough is hydrologically connected to Coyote Creek, which is part of the Don Edwards NWR, and is an area designated to be part of the refuge in the future (Don Arnold, pers. comm. 2001). The 1998 WPCP's National Pollution Discharge Elimination System (NPDES) permit limits the effluent discharge to 120 mgd due to concerns about converting the habitat of two federally-listed endangered species, the salt marsh harvest mouse and California clapper rail, from salt marsh to brackish or freshwater marsh (Calpine c*Power 2001a).

The LECEF discharge of 0.612 mgd, when combined with the WPCP discharge of 120 mgd, is not expected to change the current conditions at Don Edwards NWR, or habitat

for the two federally-listed species, because the project's discharges fall within the WPCP's permitted discharge amounts and chemical limits. No mitigation would be required of the applicant.

Noise and Light

Noise can cause the abandonment of critical activities such as nest attendance and feeding. To scare birds to this level, a noise of approximately 85 dBA sound pressure level at the bird’s ear is required (Fletcher 1971, Brown 2001). Birds will abandon a food source, even when starved, when a sound at 106 dBA is played (Thiessen et al. 1957). Typical construction is expected to result in sound levels near 65 dBA at Coyote Creek (Section 8.7, LECEF LLC. 2003). The loudest sound level from construction is during the steam blow, a process to clean the piping within the HRSG equipment. The applicant anticipates using a silencer during the cleaning to reduce the estimated unsilenced level of 129 dBA down to 89 dBA at 50 feet from the source (LECEF LLC. 2004a). Sound attenuates with every doubling of distance, so at 200 feet, the sound level would be less than 80 dBA. Because Coyote Creek is nearly 700 feet away from the steam blow, and sound levels would be attenuated to less than a threshold of 85 dBA, birds are not expected to abandon critical activities during the steam blow phase of construction. Therefore, staff concludes that this impact is less than significant, and no mitigation is recommended by staff.

Continuous noises that mask the effective communication can interfere with avian behavioral functions (e.g. masking bird mating songs or warning calls can disrupt population functions). During operations, the noise levels at Coyote Creek would be near 60 dBA (Table 8.7-11 and Appendix 8.7-D, LECEF LLC. 2003). This is nearly the same noise levels that are produced from traffic on nearby SR 237. Because there is no measurable change in the ambient environment, the operation of the combined cycle plant is unlikely to impact bird species utilizing Coyote Creek.

The applicant has designed the facility such that all lights would be non-glare to reduce light reaching off-site receptors (Calpine c*Power 2001a). Staff recommends they also direct light away from the off-site receptors, such as the riparian corridor, during construction (Condition of Certification **BIO-10**). There will be no landscape lighting which avoids any adverse impacts to wildlife in nearby Coyote Creek (see Condition of Certification **BIO-17**). Overall, the project is not expected to have significant impacts from light after implementation of the proposed mitigation.

Due to the distance from the project site, noise and light generated at LECEF will not directly interfere with the movement of any native fish or wildlife species (resident or migratory) or with established native (resident or migratory) wildlife corridors, or limit or impede the use of native wildlife nursery sites.

Spread of Weeds

There will be a temporary disturbance of approximately 13 acres for the worker parking and laydown area. Following construction of the simple-cycle facility, the applicant was required to re-vegetate this 13-acre site with barley seed and achieve full restoration within two years (Calpine c*Power 2001a). Prior to the use of this area for the combined cycle facility, similar measures shall be followed. For example, topsoil shall be salvaged

from the site and stockpiled at one end of the site. After construction, the 13-acre site should be stripped of any armoring material, the surface roughened, and top soil restored (condition of certification **BIO-14**). Prior to full restoration of like species, invasive, non-native plants could dominate the 13-acre site, potentially resulting in an overall increase in invasive, non-native species. By following the Biological Resources condition of certification **BIO-17**, the introduction and spread of weedy plant species will likely be avoided.

CUMULATIVE IMPACTS

Cumulative impacts are those that result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions, regardless of who is responsible for such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

If the U.S. DataPort facility is constructed at the same time as LECEF combined cycle elements, dust and noise from heavy equipment could have a combined impact on nearby biological resources larger than if they were built at separate times. The two projects would occur on agricultural and buffer lands which provide foraging and nesting habitat for sensitive birds and Coyote Creek is critical habitat for two species of fish. Although difficult to quantify for individual species, the general trend is for species to leave an area once a threat (perceived or actual) reaches a threshold. Individuals of each species also have their own threshold levels for human disturbance which cannot be predicted, but staff expects the combined impact of constructing both of these projects at the same time would be significant. Measures to prevent impacts such as conditions of certification **BIO-10** and **BIO-17** should be implemented to ensure impacts are mitigated to less than significant levels.

At least one other power plant is under development in the project area, MEC (99-AFC-3) and one has recently come on-line, Pico Power Project (02-AFC-3). Pico uses and MEC will use reclaimed water from the same source as LECEF, but withdrawal from this source does not directly impact any plant or wildlife species, or their habitat. The wastewater discharges from Pico Power Project and MEC were not found to be a significant impact to biological resources during siting review. In terms of traffic and noise impacts, MEC's on-line date is June 2005 so the construction schedules are not expected to overlap and thus become cumulative. Staff would not expect any overlapping, or additive, impacts to biological resources from water pollution, traffic, noise, or lighting, but did review the potential for cumulative air quality impacts.

NITROGEN DEPOSITION

Extensive air modeling was done to identify the location and amount of nitrogen deposition resulting from three energy facilities proposed in Santa Clara County. In addition, a cumulative air impact analysis was done on two proposed projects, Coyote Valley Urban Reserve and Coyote Valley Research Park, which require vehicle trips along Highway 101. Modeling for MEC concluded the power plant could deposit 0.28 kg-N/ha-yr on Coyote Ridge and 0.78 kg-N/ha-yr on Tulare Hill above ambient conditions (Abreau 2000) and the emissions from vehicles on Highway 101 were unlikely to deposit on Communication Hill. Modeling for Pico Power estimated it would

deposit 0.028 kg-N/ha-yr on Coyote Ridge and 0.048 kg-N/ha-yr on Tulare Hill above ambient conditions (Silicon Valley Power 2002). Overall, LECEF has about twice the annual nitrogen emissions as Pico Power, but emits less than MEC or the Highway 101 vehicles (**Biological Resources Table 3**). The combined deposition of all the power plants on Tulare Hill could be as high as 0.83 kg-N/ha-yr, which is an increase of 5.6% over last year's deposition of 17 kg-N/ha (extrapolated from Attachment BIO-2, Figure 4-11; LECEF LLC. 2004b). The combined deposition of all the power plants on Coyote Ridge could be as high as 0.32 kg-N/ha-yr, which is an increase of 2.1% over last year's deposition of 15 kg-N/ha.

BIOLOGICAL RESOURCES Table 3
Comparison of Nitrogen Emissions between LECEF in both Simple-cycle and Combined Cycle Mode, Metcalf Energy Center, Pico Power, and Highway 101 Vehicles (Table 8.1-39 LECEF LLC. 2003; Calpine c*Power 2001a,c; Jang 2005)

Parameters	LECEF Combined Cycle	LECEF Simple-cycle[1]	Metcalf Energy Center[2]	Pico Power[3]	Five Kilometers Vehicles on Highway 101 [2, 4]
Maximum Daily Emissions (pounds/day)	1,009.6	820.8 (four combustion gas turbines)	1,362.6 (two combustion gas turbines with duct burners)	358.9	706.5
Annual Emissions (tons per year)	99.2	74.9 (for four turbines)	123.4	43.3	117.2
Maximum Annual Emissions from Emergency Generator (tons per year)	None	0.09 (natural gas, 100 hours of operation per year)	0.2 (natural gas fired)	Unknown	Not Applicable
Maximum Annual Emissions from Fire Pump (tons per year)	0.2	0.37 (diesel, 100 hours of operation per year)	0.4 (diesel)	Unknown	Not Applicable
Maximum Modeled Nitrogen Deposition at Coyote Ridge/Kirby Critical Habitat Unit (kg-N/ha-yr)	0.0138	0.0168	0.28	0.028	Deposition expected to remain on valley floor
Maximum Modeled Nitrogen Deposition at Tulare Hill (kg-N/ha-yr)	0.0087	0.0192	0.78	0.048	Deposition expected to remain on valley floor

[1] Data from Calpine c*Power Application for Certification and the Commission Decision adopted on March 16, 2005

[2] Data from MEC's Informal Data Requests and Responses (99-AFC-3), dated April 28, 2000, Section 8.1 of the Metcalf Energy Center's AFC or the Commission Decision adopted on September 24, 2001

[3] From Commission Decision on Pico Power Combined Cycle (02-AFC-3) and applicant's submittals (Silicon Valley Power 2002).

[4] For highway travel along Highway 101 between Metcalf Canyon and South Coyote (approximately 5 km, directly adjacent to Coyote Ridge) resulting from vehicles to Coyote Valley Urban Reserve and Coyote Valley Research Park (future projects), southeast of MEC

To improve conditions for federally listed serpentine endemics, most federal (Section 7) and Habitat Conservation Plan (Section 10) consultations result in the applicant purchasing areas to be managed as preserves (USFWS 1998). LECEF (simple-cycle facility) and the other two energy facilities proposed the preservation and management of mitigation land to benefit the serpentine endemics. In addition, these energy facilities attempted to reduce overall nitrogen in the vicinity of serpentine habitat with the purchase of Emission Reduction Credits (ERCs). The merit of these mitigation proposals is discussed below.

LECEF (simple-cycle and combined cycle facility) and the other two energy facilities in San Jose (Pico Power and MEC) all calculated the amount of mitigation land necessary to offset emission impacts to the bay checkerspot butterfly in the same manner. They first modeled nitrogen deposition (in kg-N/ha-yr), and divided the results by the estimated background deposition value of 8.4 kg-N/ha-yr. The percent of background figure was multiplied by the amount of serpentine habitat. As an example, LECEF Phase 2 (combined cycle) nitrogen deposition analysis indicates there is a 0.09% to 0.4% increase above estimated background deposition, and these figures multiplied by the acres of critical habitat result in the need for 40.15 acres of mitigation land to offset the emissions impacts (Data Response 21, LECEF LLC. 2004b). However, if the higher ambient figure published in 2004 was used, there would be a smaller increase, and thus a smaller amount of mitigation land would be needed to offset emission impacts. Because all the energy facilities compared the project's proposed combined cycle emissions to the 2000 estimate instead of the 2004 data, the calculation of mitigation lands by the project owner is conservative and staff does not propose any changes.

In this air basin, ERCs are required for NO_x at a ratio of 1.15:1 in order to assure emissions will not interfere with the Bay Area Air Quality Management District's (BAAQMD's) future "attainment" of the standards for ozone. To offset their NOx emissions for the simple-cycle facility, Calpine elected to purchase precursor organic compound (POC or sometimes called VOC) credits, which are primarily hydrocarbons for the simple-cycle facility. Air District Regulation 2-2-302 allows for the use of these credits because they are precursors to ozone. All of Pico Power ERCs were NOx based, and approximately 20% of MEC's ERCs were NOx based and the remainder were POC credits. However, MEC also had provisions to manage land to benefit one of the serpentine endemic plants.

In the AFC, the applicant for LECEF combined cycle facility proposed its NOx emissions would increase from 74.9 to 99.2 tons/year, a difference of 24.3 tons/year (see Table 8.1-39, LECEF LLC 2004a) and that it would purchase ERCs to offset the increase. Because they must purchase offsets in a ratio of 1.15:1, the total amount of offset required by the BAAQMD is 27.945 tons per year (Jang 2005). In the AFC, LECEF identified specific ERCs that were available to offset any increases in pollutants (Table 8.1-60, LECEF LLC 2004a). These same ERCs were made part of the BAAQMD preliminary permit conditions (Jang 2005). The ERCs identified are both NOx based and POC based credits. Note, the purchase and surrender of only POC based credits for the simple-cycle facility was not mitigation for nitrogen deposition impacts since the POC credits do little to reduce nitrogen deposition (Data Response 24, LECEF LLC. 2004b). At the staff workshops in February 2005, staff and the applicant agreed that the purchase of nitrogen-based (NOx) credits for all of the nitrogen emission increase

above the simple-cycle facility (or 27.945 tons per year) was needed to offset the impact to sensitive serpentine plants. This agreement is not evident in the PDOC which indicates only a one-third of the increase is covered by the nitrogen-based (NOx) ERCs. The applicant, in their comments on the PDOC, identified a new set of ERC certificates, which are all NOx-based (Sierra Research 2005). The surrender of these certificates is sufficient to reduce impacts to serpentine plants to less than significant levels. Because 27.945 tons per year of NOx offsets are required to reduce the cumulative impacts in biological resources to less than significant levels, staff has required the purchase of nitrogen-based ERC's as condition of certification **BIO-22**.

MITIGATION

APPLICANT PROPOSED MITIGATION

The only measure the applicant offered to implement during construction of the combined cycle elements at LECEF was to survey the worker parking and staging area for burrowing owls prior to construction and establish avoidance areas. The only measure they proposed to implement during operation of the combined cycle elements at LECEF was the purchase 27.945 tons per year of NOx-based ERCs.

STAFF PROPOSED MITIGATION

Traffic Management

The daily traffic on the primary access road, Thomas Foon Chew Way, could have impacts to resident or nesting burrowing owls during construction. The project owner shall offer a worker education program and shall take actions to ensure construction-related staff follows the posted speed limit of 15 miles per hour as stated in Condition of Certification BIO-20.

Revegetation

Prior to use of the 13-acre worker parking and staging area the project owner will need to plan for revegetation as stated in Condition of Certification BIO-14. The Revegetation Plan would state that topsoil would be salvaged from the site and stockpiled at one end of the site. After construction, the laydown area would be stripped of any armoring material, the surface scarified, and topsoil restored. It is anticipated that the 13 acres would be revegetated with barley seed during the winter following construction. The barley would provide a temporary cover crop to hold soil and allow seeds in the native topsoil to sprout and restore a cover similar to that which existed prior to construction. The length of time between disturbance and restoration could vary with construction schedules, but in no case would be greater than two years between construction and restoration. Because grasslands can grow in one wet season, functional revegetation will occur rapidly once use of the area is complete.

Landscaping Objectives

After the construction of the combined cycle facility, the applicant will likely begin landscaping of the temporary laydown area. Staff's objectives for a landscaping plan, as identified in Condition of Certification BIO-17, include the following:

- direct landscaping lights away from the riparian area;
- limit the amounts of biocides used on the project site;
- remove invasive, non-native plants (e.g., yellow star thistle) whenever possible to avoid the spread of weeds to the riparian corridor buffer zone. Employ the most effective aspects of the following control methods: 1) manual removal and, 2) mechanical control through soil disturbance. If the previous two methods are unsuccessful in controlling the problem, the following method could be used: 3) herbicides with low environmental persistence, applied from ground-based equipment. These products should only be used within the parameters presented on the label; and
- use plants and ground cover which will be non-invasive to nearby Coyote Creek.

Burrowing Owl Management

The proper management of the mitigation lands for burrowing owls is essential to mitigate the loss of the foraging area during the construction of the simple-cycle facility. The applicant shall formally propose their management plan to the CPM and allow for the CPM follow-up on any problems as part of Condition of Certification BIO-19.

Reduction of Impacts to Serpentine Endemic Plants

The proper mitigation for serpentine endemic plants is to reduce the amount of nitrogen deposition that is occurring or to acquire mitigation lands that enhance, preserve and protect these species. Because the mitigation land purchased for the bay checkerspot butterfly may not protect the four serpentine plants, the applicant and staff agreed in a workshop all additional emissions from combined cycle operations would be offset with nitrogen-based ERC's and thus reduce ambient nitrogen and these ERC's have been incorporated in Condition of Certification BIO-22.

COMPLIANCE WITH LORS

The federal Endangered Species Act, as amended (Act), and the Fish and Wildlife Coordination Act, requires federal agencies to consult with the USFWS and the agency exercising administration over wildlife resources of the particular state wherein the proposed project is to be constructed or action taken (e.g., CDFG). The simple-cycle power plant did not require any federal permitting, and therefore coordination was left to the state administrating agency and the project applicant. Based on the nitrogen deposition modeling data from the November 2, 2001 Data Response (Calpine c*Power 2001c), the USFWS wrote the Energy Commission recommending consultation by the applicant or USEPA be pursued (USFWS 2001d). The applicant is not pursuing consultation with the USEPA because it is not considered an active federal agency in this project (LECEF LLC. 2004a). However, the applicant has taken initial steps to begin a consultation as a private party under Section 10 of the Act (DeYoung 2004, Tetzloff 2004). The USFWS has requested that the Section 10 application for "take" authorization include a thorough analysis of the effects of the power plant's operation on listed serpentine species and any conservation measures necessary to offset these effects (Martin 2004). In other Energy Commission proceedings, the USFWS has accepted mitigation land with management as a way to reduce impacts to the Bay

checkerspot butterfly and to show compliance with the Act. The USFWS advised LECEF that compliance with the Act for serpentine plants (such as Santa Clara Valley dudleya), would require either additional habitat conservation or reductions in ambient nitrogen (Martin 2004). The USFWS is unlikely to approve LECEF II Phase 2 for a Section 10 consultation without such measures. The USFWS has also requested that the Commission decision on the adequacy of mitigation be delayed until the USFWS staff has had an opportunity to review the modeling data and LECEF has obtained their permit for "take" under the Act (Martin 2004). This would significantly delay the Commission Decision since the USFWS permit could take up to two years. Compliance with Conditions of Certification **BIO-18** and **BIO-22** will ensure that the applicant cannot be found in violation of the Act in the future and we do not recommend delaying the Commission Decision.

FACILITY CLOSURE

The region surrounding the proposed project, upon completion of the U.S. DataPort complex, would be industrial in character, and is expected to remain so for years to come. The closure of the power plant and ancillary features (either temporary or permanent) would not have an impact to biological resources, and no measures are necessary unless U.S. DataPort (or similar facility) construction has not started at the time of closure.

Sometime in the future, LECEF will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM) (Condition of Certification **BIO-9**). Facility Closure mitigation measures will also be included in the BRMIMP prepared by the applicant (Condition of Certification **BIO-8**).

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

The planned permanent or unexpected permanent closure plan is addressed in Biological Resources Condition of Certification **BIO-9**.

UNEXPECTED TEMPORARY CLOSURE

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of LECEF. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the facility closure measures provided in the on-site contingency plan and the BRMIMP would need to be implemented.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public regarding Phase 2.

CONCLUSIONS AND RECOMMENDATIONS

The Applicant has successfully reduced construction-related impacts to biological resources to a very low level of likelihood by using a previously disturbed site. However, indirect impacts to sensitive species on the contiguous parcels are likely. Staff recognizes that burrowing owls could move onto the site at any time, but pre-construction surveys and avoidance should be adequate to mitigate all potential direct or indirect impacts.

Research has shown that nitrogen deposition at ambient levels is an impact to bay checkerspot butterfly, and intensive land management is needed to protect this species (Weiss 1999). Impacts to serpentine plants from nitrogen deposition are also likely in the air basin. Indirect impacts on serpentine endemics is difficult to detect because of LECEF's low emission levels and the distances between the power plant and the nearest serpentine soils area. Biology staff, after discussion with the Air Quality staff, notes that implementation of BACT, the purchase of NOx-based ERCs, or reductions in ammonia slip, are the best ways to ensure nitrogen deposition does not increase for serpentine endemics within the air basin as a result of the proposed combined cycle project. The applicant will implement BACT to reduce NOx emissions and will be purchasing ERCs to reduce ambient nitrogen. In addition, they have purchased mitigation lands which they will manage to benefit the butterfly. After implementation of these measures, impacts to the butterfly and other serpentine endemics will be less than significant.

At this time staff recommends the following conditions of certification be adopted to avoid significant impacts to biological resources and to ensure the project remains in compliance with all LORS.

PROPOSED CONDITIONS OF CERTIFICATION

Staff recommends the following Biological Resources Conditions of Certification be carried forward as modified to the Phase 2 combined cycle project license:

DESIGNATED BIOLOGIST

BIO-1 Site and related facilities (including any access roads, transmission lines, water and gas lines, storage areas, staging areas, pulling sites, substations, wells, etc) mobilization activities <u>for the combined cycle facility</u> shall not begin until an Energy Commission CPM approved Designated Biologist <u>or approved Biological Monitor(s) are</u> ~~is~~ available to be on-site.

<u>Protocol:</u> 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 nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

3. At least one year of field experience with biological resources found in or near the project area; and

4. An ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No habitat disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new Designated Biologist or approved Biological Monitor(s) is on-site.

Verification: At least 35 days prior to the start of any site and related facilities mobilization activities for the combined cycle facility, the project owner shall submit to the CPM for approval the name, qualifications, address, and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement as specified in the Condition must be submitted in writing at least 10 working days prior to the termination or release of the preceding Designated Biologist.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The CPM approved Designated Biologist shall perform the following during any site and related facilities mobilization, construction, and-operation activities for the combined cycle facility:

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. Supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species; and

3. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification.

4. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, WEAP training and all permits

5. The Designated Biologist may be assisted by the approved Biological Monitor(s), but remains the contact for the project owner and CPM.

Verification: During site and related facilities mobilization and construction the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During site and related facilities mobilization and construction for

the combined cycle facility, the Designated Biologist shall submit reports when warranted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR(S) AUTHORITY

BIO-3 The project owner's Construction/Operation Manager for the combined cycle facility shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the Biological Resources Conditions of Certification.

Protocol: The project owner's Construction/Operation Manager shall halt, if necessary, all construction or operation activities in areas specifically identified by the Designated Biologist and Biological Monitor(s) as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist and Biological Monitor(s) shall:

1. Inform the project owner and the Construction/Operation Manager when to resume construction or operation, and
2. Advise the Energy Commission CPM if any corrective actions are needed or have to be instituted.

Verification: Within 2 working days of a Designated Biologist or Biological Monitor(s) notification of non-compliance with a Biological Resources Condition of Certification or a halt of construction or operation, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-4 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 or related facilities during site mobilization, construction and operation of the combined cycle facility, are informed about sensitive biological resources associated with the project. The training may be presented in the form of a videotape or digital video disk presentation so long as the Protocol is met.

Protocol: The Worker Environmental Awareness Program must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which

supporting written material and electronic media 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: At least 30 days prior to the start of any site and related facilities mobilization, the project owner shall provide two copies of the Worker Environmental Awareness Program and all supporting written materials and electronic media reviewed or prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the mobilization and 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 six months, following the termination of an individual's employment.

STREAMBED ALTERATION AGREEMENT

BIO-5 Prior to start of any site or related facilities mobilization activities of the interior side of the levee, the project owner shall acquire a Streambed Alteration Agreement from the CDFG if required, or show CDFG correspondence that indicates no permit is required. The project owner will implement the agreement terms and conditions.

Protocol: Provisions in the CDFG Streambed Alteration Agreement include (typical measures are):

1. Completion of all work in the streams when the work sites are dry;
2. Not removing or damaging woody perennial stream bank vegetation outside of the work area;
3. Not removing soil, vegetation, and vegetative debris from the streambed or stream banks;

4. Not exceeding the amount of fill placed within stream channels above that which naturally occurred in the stream channel prior to the start of work;
5. Not creating silty or turbid water when water returns to the stream, and not discharging silty water into the stream, nor creating turbid water within the stream;
6. Stabilizing slopes toward the stream to reduce erosion potential;
7. Locating equipment, material, fuel, lubricant and solvent staging and storage areas outside the stream, and using drip pans with motors, pumps, generators, compressors, and welders that are located within or adjacent to a stream;
8. Moving all vehicles away from the stream prior to refueling and lubricating;
9. Preventing any substance that could be hazardous to aquatic life from contaminating the soil and/or entering the waters of the area;
10. Cleaning up all spills immediately; and
11. Returning stream low flow channel, bed, or banks to as nearly as possible to their original configuration and width.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities on the interior side of the levee the project owner shall submit to the CPM a copy of the final CDFG Streambed Alteration Agreement or applicable CDFG correspondence. Agreement terms and conditions will be incorporated into the BRMIMP.

REGIONAL WATER QUALITY CONTROL BOARD CERTIFICATION

BIO-6 The project owner will acquire and implement the terms and conditions of the Regional Water Quality Control Board Section 401 State Clean Water Act certification, if required.

Verification: No less than 30 days prior to the start of any site or related facilities mobilization activities on the interior side of the levee, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board (RWQCB) certification. The terms and conditions of the certification will be incorporated into the project's BRMIMP.

U. S. ARMY CORPS OF ENGINEERS SECTION 404 PERMIT

BIO-7 The project owner shall provide a final copy of the Section 404 permit, if required. The project owner will implement the terms and conditions contained in the permit.

Verification: No less than 30 days prior to the start of any site and related facilities mobilization of the interior side of the levee, 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 BRMIMP.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-8 The project owner shall submit to the CPM for review and approval a copy of the final BRMIMP and shall implement the measures identified in the plan. Any changes to the adopted BRMIMP must be made by the Energy Commission staff, in consultation with the USFWS and CDFG.

Protocol: The final BRMIMP shall identify:

1. All biological resources mitigation, monitoring, and compliance measures recommended by the Applicant, as well as those contained in the BIO-Condition of Certification (and other mitigation requirements);
2. All provisions specified in a CDFG Streambed Alteration Agreement;
3. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;
4. All required mitigation measures for each sensitive biological resource;
5. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources;
6. A detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities;
7. All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
8. Aerial photographs of all areas to be disturbed during project construction activities - one set prior to any site mobilization disturbance and one set after completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen;
9. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
10. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
11. All performance standards and remedial measures to be implemented if performance standards are not met;
12. A discussion of biological resources related facility closure measures;
13. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval; and
14. A detailed plan of the management of top soil (from onsite, laydown, and linear areas) during the construction phase.
15. <u>All provisions from the USFWS Permit.</u>

Verification: At least 30 days prior to start of any site or related facility mobilization activities for the combined cycle facility, the project owner shall provide the CPM with 2 copies of the draft final version of the BRMIMP for this project, and provide copies to the USFWS and CDFG. The CPM, in consultation with the USFWS and CDFG, will determine the plan's acceptability within 15 days of receipt. If some construction has been authorized by the CPM to start, and if there are any permits that had not yet been received when the BRMIMP was first submitted, then these permits shall be submitted to the CPM, the CDFG and USFWS within five (5) days of their receipt and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. The project owner shall notify the CPM no less than 5 working days before implementing any modifications to the BRMIMP to obtain CPM approval. Two copies of the CPM approved BRMIMP must be provided to the CPM and copies provided to the USFWS and CDFG.

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.

CLOSURE PLAN MEASURES

BIO-9 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources.

Protocol: The planned permanent or unexpected permanent closure plan will address the following biological resources related mitigation measures (typical measures are):

1. Removal of transmission conductors when they are no longer used or useful;
2. Removal of all power plant site facilities and related facilities;
3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and,
4. Revegetation of the plant site and other disturbed areas utilizing appropriate seed mixture.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities construction, the project owner shall address all biological resources 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. The biological resources facility closure measures will also be incorporated into the BRMIMP.

MITIGATION MEASURES

BIO-10 The project owner will implement the mitigation measures identified below.

Protocol: The project owner will:

1. Site transmission line poles, access roads, pulling sites, and storage and parking areas to avoid sensitive resources whenever possible;
2. Avoid all wetlands;
3. Design and construct transmission lines and poles to reduce the likelihood of electrocutions of large birds;
4. Implement the terms and conditions of a current CDFG Streambed Alteration Agreement (if required);
5. Implement a Worker Environmental Awareness Program;
6. Clearly mark construction area boundaries with stakes, flagging, and/or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during facility construction/modernization. All equipment storage will be restricted to designated construction zones or areas that are currently not considered sensitive species habitat. Parking will not be allowed below the canopy of trees;
7. Provide a Designated Biologist to monitor all activities that may result in incidental take of listed species or their habitat;
8. Fence and provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches <u>outside of the facility fence</u>. Fence will be hardware cloth or similar materials that are approved for use by the USFWS and CDFG;
9. Inspect trenches <u>outside of the facility fence</u> every 12 hours for entrapped animals and prior to the beginning of construction in an area that has been unattended for over 3 hours during the night. Inspections will be made by someone specially trained by the Designated Biologist in the proper handling of wildlife. Construction will be allowed to begin only after trapped animals are able to escape voluntarily or in a safe and humane manner.
10. Inspect all construction pipes, culverts, or similar structures with diameter of 4-inches or greater <u>outside the facility fence</u> for sensitive species (such as foxes) prior to pipe burial. Pipes to be left in trenches for more than eight 8 hours will be capped.
11. Provide a post-construction compliance report, within 45 calendar days of completion of the project, to the Energy Commission CPM;
12. Make certain that all food-related trash will be disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited;
13. Report all inadvertent deaths of sensitive species to the appropriate project representative. Injured animals will be reported to the CDFG, and the project owner will follow instructions that are provided by the CDFG;
14. Limit the use of biocides in project areas (see **BIO-17** for more detail); ~~and~~

15. Implement erosion control in the temporary impact areas, especially near wetlands and waterways;
16. Any fixed lighting used during construction activities must be designed to be directed downward and away from riparian areas;
17. No construction activity shall be allowed within 500 feet of the levee wall from one (1) hour before sunset until one (1) hour after sunrise (as defined by a California solar timetable); ~~and~~
18. Contact the San Francisco Bird Observatory (Sherry Hudson at 408-946-6548 or shudson@sfbbo.org) two weeks prior to beginning construction of the stormwater outfall at the levee wall to arrange alternative access to the Observatory's long-term bird banding site; and
19. Follow the management plan for the burrowing owl mitigation area (see **BIO-19** for more detail).

Verification: All mitigation measures and their implementation methods will be included in the BRMIMP. Two copies of the CPM approved BRMIMP must be provided to the CPM five days prior to site mobilization and copies provided to the USFWS and CDFG.

SURVEY AND PROVIDE HABITAT COMPENSATION FOR BURROWING OWLS

BIO-11 The applicant shall survey for burrowing owl activities on the 34~~55~~-acre parcel and along all new ancillary linear facilities prior to site mobilization to assess owl presence and need for further mitigation. All survey results shall be submitted to the CDFG. If owls are present, and nesting is not occurring, owls are to be removed per CDFG-approved passive relocation. Passive relocation is recommended from September 1 to January 31, to avoid disruption of breeding activities. If owls are nesting, nest(s) should be avoided by a minimum of a 250-foot buffer until fledging has occurred (February 1 through August 31). Following fledging, owls may be passively relocated.

If burrowing owls are found on the site or along all new ancillary linear~~s~~ corridors on-site or off-site compensation for losses will be required, whichever is feasible. CDFG recommends 6.5 acres of protected lands for each pair of owls or unpaired resident bird. Foraging habitat should be replaced at 0.5:1 (mitigation:impacts). Mitigation lands bought outside of Santa Clara County shall be purchased at a 0.75:1 (mitigation: impacts) for contiguous counties and 1.5:1 for all other California counties. In addition, existing unsuitable burrows on the protected lands should be enhanced (e.g., cleared of debris or enlarged) or new burrows installed at a ratio of 2:1. If off-site compensation is the only option, the mitigation ratios will increase depending on the distance from the site and burrowing presence on or near the mitigation parcel.

Verification: Burrowing owl surveys shall be conducted 20 days prior to any project-related ground disturbance activities. At least 15 days prior to project related ground disturbance the project owner shall provide the CPM and CDFG with the burrowing owl

survey results and identify any lands proposed for mitigation (if applicable). The land purchase shall be approved by the CPM and reviewed by CDFG. The project owner shall notify the CPM five working days before implementing any modifications to the BRMIMP.

REPLACEMENT OF ORDINANCE AND NATIVE MATURE TREES

BIO-12 Prior to the start of any site mobilization for the simple-cycle facility, the project owner shall develop the Ordinance and Native Mature Tree Replacement Plan for inclusion into the BRMIMP. The protocol shall include a thorough discussion of methods, species, and location for plantings, criteria for success, a monitoring program for 5 years, and a reporting requirement. If the CPM determines that the plan requires modification, the project owner shall modify the report based on the CPM's comments.

Verification: At least 30 day prior to the start of any site and related facilities mobilization, the project owner shall provide to the CPM for review and approval, and to CDFG for review, a Ordinance and Native Mature Tree Replacement Plan as part of the BRMIMP.

CITY OF SAN JOSE ORDINANCE TREE

BIO-13 The project owner will acquire a City of San Jose permit to remove any remaining ordinance trees from the simple-cycle facility site. The number of trees removed will be minimized and construction equipment and linear~~s~~ corridors in the dripline of these trees will be avoided. The applicant will be required to replace any trees removed at a ratio of 4:1 (mitigation: impact) per the U.S. DataPort EIR.

Verification: The terms and conditions of the City of San Jose permit(s) will be incorporated into the project's BRMIMP and submitted at least 90 days prior to removal of any remaining ordnance trees (or those not covered by the City of San Jose Planned Development Permit). A copy of the permit(s) should be included as an appendix to the BRMIMP.

REVEGETATION OF TEMPORARY DISTURBANCE

BIO-14 After construction, the laydown area will be stripped of any armoring material, the surface scarified, and topsoil restored. Barley seed will be sowed as a temporary cover crop, but native seeds from the topsoil will be allowed to sprout and grow.

Verification: The applicant shall provide the revegetation plan in the BRMIMP and submit it within 60 days after the start of any site and related facilities mobilization.

AVOID IMPACTS TO RIPARIAN COMMUNITIES

BIO-15 Construction of the permanent outfall to Coyote Creek shall be scheduled to avoid critical seasons. Surveys by a qualified biologist will be conducted prior to any construction activities on the interior side of the levee to locate nests and other resources in/or adjacent to the stormwater right-of-way. Designated existing roads will be used, and if such roads are not present, flagged routes that have been surveyed by a biologist will be used. If nests are observed, an

avoidance period and buffer area shall be followed by all construction personnel. Construction plans will be submitted with a photo alignment sheet to the Energy Commission CPM for approval and to CDFG for review.

Verification: The applicant shall provide this measure as an amendment to the BRMIMP and as part of the roles for the Designated Biologist. Submittals of construction plans must occur 30 days prior to site mobilization on the interior side of the levee wall, but does not preclude the start of construction on the facility site. In lieu of CDFG review, the applicant may submit a copy of their final Streambed Alteration Agreement permit.

HABITAT COMPENSATION FOR SERPENTINE ENDEMICS

BIO-16 To compensate for impacts to serpentine soils and associated endemic species, the project owner shall provide a minimum of 40 acres of land within a high priority (as defined by USFWS) or occupied USFWS Critical Habitat Unit, the name of the entity that will be managing the land in perpetuity, and the endowment funds in the amount determined suitable from the Center for Natural Lands PAR analysis to administer and manage in perpetuity. Each of these must have been pre-approved by Energy Commission staff.

Verification: Within one month of project certification of the simple-cycle facility, the project owner must provide to the CPM for approval, the name of the management entity, written verification that the compensation lands have been purchased and written verification that the appropriate endowment fund (determined by the PAR analysis) has been received by the approved management entity.

LANDSCAPING PLAN

BIO-17 The applicant will complete a Landscaping Plan for review by the CPM. The project owner shall follow the approved Landscaping Plan during the lifetime of the power plant.

Protocol: The Landscaping Plan must include measures which:

1. Direct landscaping lights away form the riparian area;
2. Limit the amounts of biocides used on the project site;
3. Remove invasive, non-native plants (e.g., yellow star thistle) whenever possible to avoid the spread of weeds to the riparian corridor buffer zone. Employ the most effective aspects of the following control methods: 1) manual removal and, 2) mechanical control through soil disturbance. If the previous two methods are unsuccessful in controlling the problem, the following method could be used: 3) herbicides with low environmental persistence, applied from ground-based equipment. These products should only be used within the parameters presented on the label;
4. Avoid plant species that are not already found within the Coyote Creek watershed to avoid potentially new hybrids from cross-pollination;
5. Select a drought-tolerant mix of native species for ground cover;

6. Select a drought-tolerant mix of native tree species to the extent possible, particularly along the eastern edges of the landscaped areas (facing Coyote Creek);
7. Avoid long-term irrigation and limit short-term irrigation;
8. Avoid landscaping species/design(s) which would require initial and/or future maintenance equipment that contribute to noise and/or air pollution; and
9. Avoid the use of non-native ground cover (e.g., bark, rocks, soils).

Verification: At least 45 days prior to LECEF landscape installation, a Landscaping Plan will be sent to the CPM. All mitigation measures and their implementation methods will be included in the BRMIMP. Two copies of the BRMIMP must be provided to the CPM and one copy each provided to both the USFWS and CDFG five days prior to landscape installation.

U. S. FISH AND WILDLIFE SERVICE PERMIT

BIO-18 The project owner shall provide a final copy of the Section 10 permit from the U.S. Fish and Wildlife Service (if required) to the CPM. The project owner will implement the terms and conditions contained in the permit and incorporate these into the BRMIMP.

Verification: The applicant shall provide the CPM with a status report of the Section 10 permit every six months beginning January 2006 until the permit is obtained or is no longer necessary. The status report shall include a table of milestones and the dates milestones were completed or are expected to be completed. No less than 30 days after receiving the permit (if required), the project owner shall provide two unbound copies of the Section 10 permit to the CPM.

BURROWING OWL MANAGEMENT PLAN

BIO-19 The project owner shall create a Burrowing Owl Management Plan (Plan) and incorporate the provisions from the Plan into the BRMIMP for review by the CPM. The project owner shall be responsible for ensuring the power plant employees and contractors (most notably the landscape maintenance crew) are aware of the special provisions within the Plan, and shall make reasonable efforts to ensure these provisions are being followed during the operational lifetime of the power plant. Limit the use of biocides in the burrowing owl management area (see **BIO-17** for more detail).

Verification: All mitigation measures and their implementation methods will be included in the BRMIMP. The annual compliance report shall provide the CPM with the name and phone number of the landscape maintenance crew supervisor. The CPM reserves the right to inspect the burrowing owl management area and to contact the landscape maintenance crew supervisor to correct problems

WORKER EDUCATION AND SPEED LIMITS ON PRIMARY ACCESS ROAD

BIO-20 During construction of the combined cycle facility, the project owner shall distribute flyers to project-construction employees informing them of the

possible presence of burrowing owls near Thomas Foon Chew Way. The project owner shall highlight that the posted speed limit is 15 miles-per-hour along the primary access road, Thomas Foon Chew Way, and take actions to correct repeat violations by project-construction drivers.

Verification: All mitigation measures and their implementation methods will be included in the BRMIMP. The monthly compliance report shall include the number of possible speed limit violations. The CPM reserves the right to inspect the primary access road for signs and to contact the construction manager to correct problems.

BIOLOGICAL MONITOR QUALIFICATIONS

BIO-21 The project owner shall submit the resume and contact information of the proposed Biological Monitor(s) to the CPM for review. Biological Monitor(s) training by the Designated Biologist shall include familiarity with the Conditions of Certification, the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), the Worker Environmental Awareness Program (WEAP), and all permits.

Verification: The project owner shall submit the specified information to the CPM for review at least 30 days prior to the start of any site (or related facilities) mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed as part of the MCR or annual reporting. If additional Biological Monitors are needed during construction the specified information shall be submitted to the CPM for review 10 days prior to their first day monitoring activities.

PURCHASE OF NITROGEN-BASED EMISSION REDUCTION CREDITS

BIO-22 The project owner must surrender to the Bay Area Air Quality Management District a package of emission offsets which contain at least 27.945 tons per year nitrogen oxide. The substitution of precursor organic compound emission offsets is prohibited. The preferred set of certificates to be surrendered is as follows:

Current Owner	Cert. No.	POC (tons per year)	NOx (tons per year)	Origin, Location	Date Banked
LECEF	724	0	7.100	Cardinal Cogen, Palo Alto	3/13/96
Calpine	896	0	304.594	PG&E Potrero Power Plant, San Francisco	9/30/85
		TOTAL	311.694		
		Balance (to be refunded)	283.749		

Verification: At least 60 days prior to construction, the project owner/operator must surrender the ERC certificates and provide copies to the CPM. The total emission offsets that are nitrogen based must be clearly identified in the cover letter.

REFERENCES

Abreau, K. 2000. Metcalf Energy Center (99-AFC-3): Data Responses, Set 1G and Set 3D. *Impact Analysis for Metcalf Energy Center NOx Emissions, Santa Clara County, California. Attachment BR-32R. Revision 1.* Prepared by CH2M Hill, Sacramento, California. Prepared for Calpine Corporation and Bechtel Enterprise Holdings, Inc. February. 34pp.

Arnold, Don. 2001. Santa Clara Valley Water District. E-mail to Julie Colyer regarding SJ/SC Water Pollution Control Plant. November 14, 2001.

Brown, L. 2001. *The Response of Sea Birds to Simulated Acoustic and Visual Aircraft Stimuli*. In Proceedings of the Effects of Noise on Wildlife Conference. Institute for Environmental Monitoring and Research. August 22 to 23, 2000. pp. 56-59.

Calpine c*Power. 2001a. Application for Certification, Los Esteros Critical Energy Center (01-AFC-12). 2 Volumes. Submitted to the California Energy Commission on August 7, 2001.

CDT (California Department of Transportation), U.S. Department of Transportation, and Federal Highway Administration. 1995. Devil's Slide Draft Supplemental Environmental Impact Statement/Environmental Impact Report. State Clearing House No. 83051706 4-SM-1 PM 34.0/41.0 (KP 54.7/66.0) 4210-112371.

CEC (California Energy Commission). 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission). 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission). 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. July 2, 2002.

CEC (California Energy Commission). 2004. Commission Order Approving Project Modification: Approving a Shorter Temporary Transmission Tap Line (Order No 04-0121-06). January 21, 2004.

CPUC (California Public Utilities Commission). 2000. Pacific Gas and Electric Company's Application for Certificate of Public Convenience and Necessity for Northeast San Jose Transmission Reinforcement Project (Application 99-09-029) Environmental Impact Report. Prepared by Aspen Environmental Group. June.

City of San Jose. 2001. Draft and Final Environmental Impact Statement, US Dataport Project. Approved April 3, 2001.

City of San Jose. 1994. 2020 General Plan. Adopted August 16, 1994.

De Young, Steve. 2004. <steve4155@astound.net>. “FW: Los Esteros Project Consultation.” May 14, 2004. Personal e-mail. (accessed May 14, 2004).

Dunn, T.D., R. D. Wilson, J. M. Norbeck, J.W. Miller, T. Huai, and S.H. Rhee. 2002. *Estimates of the emission rates of ammonia from light-duty vehicles using standard chassis dynamometer test cycles.* Atmospheric Environment, 36. pp. 1475-1482.

Fenn, M.E., R. Haeuber, G.S. Tonnesen, J.S. Baron, S. Grossman-Clarke, D. Hope, D.A. Jaffe, S. Copeland, L. Geiser, H.M. Rueth, and J.O. Sickman. 2003. *Nitrogen Emissions, Deposition, and Monitoring in the Western United States*. BioScience, 53. pp. 391-403.

Fletcher, J. 1971. *Effects of Noise on Wildlife and Other Animals*. Memphis State University for U.S. Environmental Protection Agency. (NTIC300.5).

Fox, Douglas, A.M. Bartuska, J.G. Byrne, and others. 1989. *A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas.* Gen. Tech. Rep. RM-168. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 36p. at www.fs.fed.us/r6/aq/natarm/screen.pdf

Goude, C. 2001. U.S. Fish and Wildlife Service. *Formal Endangered Species Consultation on the Prevention of Significant Deterioration Permit for the Proposed Metcalf Energy Center, San Jose, Santa Clara County, California.* Letter to Duong Nguyen, U.S. Environmental Protection Agency, Region IX. March 7, 2001.

H.T. Harvey & Associates. 2000. U.S. DataPort Biotic Assessment and Riparian Survey. Prepared for Nora Monette. June 6. Revised August 24, 2000.

Jang, D. 2004. *Preliminary Determination of Compliance; Los Esteros Critical Energy Facility Plant 13289 Combined Cycle Conversion (Phase 2).* Application 8859. September 28, 2004.

Jang, D. 2005. *Revised Preliminary Determination of Compliance; Los Esteros Critical Energy Facility Plant 13289 Combined Cycle Conversion (Phase 2).* Application 8859. March 16, 2005.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

Martin, C. 2004. Sacramento Fish and Wildlife Office. Letter to Terrence O'Brien, California Energy Commission. July 16, 2004.

National Marine Fisheries Service (NMFS), National Oceanic and Atmoshpheric Administration, Department of Commerce. 2000. *Designated Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho, and California.* Federal Register: 65. February 16, 2000. pp. 7764-7787.

O'Brien, T. 2004. California Energy Commission Environmental Office. Letter to Jan C. Knight, Sacramento Fish and Wildlife Office. March 26, 2004.

Santolo, G. 2002. *Burrowing Owl Clearance Survey for the LECEF Project*. Prepared for E.J. Koford. Technical Memorandum. January 9, 2002.

Sierra Research. 2005. *Revised Preliminary Determination of Compliance for Los Esteros Critical Energy Facility; BAAQMD Application 8859.* Letter from Gary Rubenstein to Dennis Jang, Bay Area Air Quality Management District. May 5, 2005.

Sierra Research. 2004. First Quarter 2004 NOx and NH3 Emissions Summary for LECEF. Submitted from Nancy Matthews by e-mail on May 21, 2004.

Sierra Research. 2000. Nitrogen Deposition Baseline. Memo from Gary Rubenstein to Ken Abreu, Metcalf Energy Center. June 1, 2000. Submitted under cover of *Supplemental Information to Metcalf Energy Center Biological Assessment Regarding Nitrogen Deposition and Impacts to Serpentine Habitat*.

Silicon Valley Power. 2002. Supplement in Response to Data Adequacy Comments on the Application for Certification for the Pico Power Project (02-AFC-03). November 14, 2002.

Tetzloff, R. 2004. Letter to Cecilia Brown, U.S. Fish and Wildlife Service. *Los Esteros Critical Energy Facility Development of a Habitat Conservation Plan and Intent to seek and Incidental Take Permit under Section 10 of the Federal Endangered Species Act.* Dated July 2, 2004.

USFWS (U.S. Fish and Wildlife Service). 2004. *Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the California Red-legged Frog (Rana aurora draytonii); Proposed Rule*. Federal Register 69: 19619-19642.

USFWS. 2002. Recovery Plan for California Red-legged Frog (*Rana aurora draytonii*). Portland, Oregon. 173 pp.

USFWS. 2001c. *Endangered and Threatened Wildlife and Plants: Final Determination of Critical Habitat for the Bay Checkerspot Butterfly* (Euphydryas editha bayensis). Federal Register: 66: 21450-21489. April 30, 2001.

USFWS. 2001. Sacramento Fish and Wildlife Office. Letter to Jim Brownell, California Energy Commission from Jan C. Knight. November 30, 2001.

USFWS. 1998. *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area.* Portland, Oregon. 330+ pp.

Weiss, S. 1999. Cars, cows and checkerspot butterflies: nitrogen deposition and management of nutrient-poor grasslands for a threatened species. Conservation Biology 13(6): 1476-1486.

CULTURAL RESOURCES

Testimony of Dorothy Torres

INTRODUCTION

The cultural resources section identifies potential impacts of the proposed Los Esteros Critical Energy Facility (LECEF) to cultural resources. Staff considers the realm of potential "cultural resources" to include anything created or affected by human beings. The term "cultural resources", as defined in law, includes buildings, sites, structures, objects, and historic districts. If it appears that a project can not avoid a potential cultural resource, the cultural resources must be evaluated for eligibility to the California Register of Historic Resources (CRHR). The primary purpose of the cultural resources analysis is to ensure that all potential impacts are identified, and that conditions of certification set forth mitigation that ensures impacts to eligible cultural resources are mitigated below a level of significance under the California Environmental Quality Act (CEQA).

Staff provides a cultural overview of the project, as well as analyses of potential impacts from the project using criteria from CEQA. If cultural resources are identified, staff determines whether there may be a project-related impact to identified resources and if the resource is eligible for listing on the California Register of Historic Resources (CRHR). If the resources are eligible for either register, staff recommends mitigation that attempts to ensure that no significant impacts will occur and that impacts to the cultural resources are reduced to a less than significant level, if possible.

There is always a potential that a project may impact a previously unidentified prehistoric or historic resource in an unanticipated manner. Therefore, staff recommends procedures in the conditions of certification that mitigate these potential impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following laws, ordinances, regulations, and standards (LORS) and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these LORS.

FEDERAL

- Code of Federal Regulations, 36 CFR Part 61. Federal Guidelines for Historic Preservation Projects: The U.S. Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for mitigation of impacts to cultural resources on public lands in California.

- Code of Federal Regulations, 36 CFR Part 800 et seq., the implementing regulations of Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470 requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. The regulations implementing this act, which were revised in 1997, set forth procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria and the process described in these regulations are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

STATE

- Public Resources Code, Section 5000 establishes the California Register of Historical Resources (CRHR), establishes criteria for eligibility to the CRHR, and defines eligible resources. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and states that it is the policy of the State that Native American remains and associated grave artifacts shall be repatriated.
- California Code of Regulations, Title 14, section 4852 describes the range of historical resources that best reflect the history of California. It also identifies the criteria used to determine eligibility for listing in the California Register. Types of resources considered for listing include buildings, sites, structures, objects, and historic districts.
- Public Resources Code section 21083.2 states that the lead agency determines whether a project may have a significant effect on “unique” archaeological resources; if so, an Environmental Impact Report (EIR) shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the applicant’s cost of mitigation; sets time frames for excavation; defines “unique and non-unique archaeological resources;” and provides for mitigation of unexpected resources. [The California Energy Commission process is a CEQA equivalent process].
- Public Resources Code section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource. The section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- Government Code section 37361 (b) allows the legislative body of a City to make special provisions for cultural resources identified as having special character or special historical or aesthetic interest or value.

- California Environmental Quality Act (CEQA) Guidelines, Title 14, California Code of Regulations, section 15126.4(b), prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project's impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, section 15064.5 defines the term "historical resources," explains when a project may have a significant effect on historic resources, describes CEQA's applicability to archaeological sites, and specifies the relationship between "historical resources" and "unique archaeological resources." Subsection (f) directs the lead agency to make provisions for historical or unique archeological resources that are accidentally discovered during construction.
- Penal Code, section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.
- California Health and Safety Code, section 18961 states that all agencies which enforce and administer approvals, variances, or appeals procedures or decisions affecting the preservation or safety of the historical aspects of historical buildings shall use the alternative provisions of this part and shall consult with the State Historical Building Safety Board to obtain its review prior to undertaking action or making decisions on variances or appeals which affect historical buildings.

LOCAL

City of San Jose

The San Jose 2020 General Plan, 2005 update, asserts that the City has a long colorful heritage that is valuable in adding to a sense of community identity. The City of San Jose seeks to do this by promoting an awareness of San Jose's historic and archaeological heritage.

The City's goal is preservation of historically and archaeologically significant structures, sites, districts and artifacts. The City has developed an eleven-point plan that illustrates the City's policy:

1. Preservation of irreplaceable historic and archaeological resources should be a key consideration in the development review process.
2. The City should use the Area of Historic Sensitivity overlay and landmark designation process to promote and enhance the preservation process.
3. An inventory of significant structures should be maintained and promoted.

4. Areas of numerous significant sites or structures should be considered for inclusion and preservation as Historic Preservation Districts.
5. New development should be designed to be compatible with nearby designated historic resources.
6. The City should foster rehabilitation of buildings and offer financial incentives to assist in the rehabilitation.
7. Historic structures proposed for demolition should be considered for relocation.
8. The City requires archaeologically sensitive areas be investigated during the planning process and appropriate mitigation efforts should be incorporated into the project design.
9. If Native American burials are encountered during construction, development activity should cease until examination and reburial in an appropriate manner is accomplished.
10. Heritage trees should be maintained and protected in a healthy state.
11. The City should encourage the appropriate Federal and State programs that provide tax and other incentives for preservation of resources (City of San Jose, 2005, pp. 103-104).

ENVIRONMENTAL SETTING

The LECEF project footprint, including all linear facilities, construction laydown areas, and access routes, is located within the Alviso area of the City of San Jose, California. The site is surrounded by Coyote Creek to the east, SR 237 to the south, and a Water Pollution Control Plant and buffer lands to the west and north. The Phase 2 conversion of LECEF to combined-cycle operation is located within the 21 acre parcel that includes LECEF fencing and landscaping. The 21-acre parcel is located within a larger 34-acre parcel. The 34-acre parcel includes 13 acres that would be used for LECEF Phase 2 construction lay-down area.

The immediate northern border of the project contains the new Silicon Valley Power (SVP) 230 kV Switching Station, and adjacent to the north the PG&E Los Esteros Substation. The SVP switching station will be the electrical termination of the 200-foot long overhead transmission lines for the Phase 2 electrical output. The SVP, and the PG&E substation site, were surveyed as part of the larger 55-acre site at the time of the original LECEF project (01-AFC-12). No impacts to known cultural resources were identified for this area.

Refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

In pre-historic times, the area was floodplain grassland, perhaps characterized by scattered oak, sycamore, and willow trees, especially along the Coyote Creek corridor. Watercourses were favored locations for pre-historic occupation in the Santa Clara Valley. From such spots, Native Americans could exploit a variety of ecological niches

on the alluvial plain, the nearby foothills, and the productive marshes of Southern San Francisco Bay. Over time, however, pre-historic settlements were forced to relocate in response to flooding and changes in the course of the river. For this reason, the potential to discover buried archaeological deposits throughout the adjacent floodplain of Coyote Creek is very high (LECEF, 2001, p. 8.3-3).

There are many well dated deposits between 10,000 and 6,000 years Before Present (BP). The larger share of these sites are found in southern California and the Great Basin. Sites from this period in the inland areas tend to concentrate around lake shores and marshes, while coastal sites tend to concentrate along old stream channels and estuaries. Animals that live on land as well as in the water were hunted for food. The abundant food resources in the lacustrine (lake edge), marshland, and estuarine (tidal area of a river) areas were sufficient to support larger populations than during the earlier period. Lithic (stone) technology became more sophisticated and the assemblages exhibited a wider array of specialized tools. Archaeologists assume that these peoples were still nomadic in nature, probably moving in seasonal rounds (Moratto 2004, pp.76-113).

ETHNOGRAPHIC BACKGROUND

Ethnographically, the project site is located within the Tamyen territory of the Costanoan, or Ohlone. Based on Spanish mission records and archaeological data, researchers estimated the Tamyen to be about 1,000 to 2,000 individuals in 1770. Within the Tamyen territory the population was further sub-divided into Tribelet territories, which were defined by physiographic features and usually had one or more permanent villages surrounded by a number of temporary camps. The Costanoan aboriginal lifeway apparently disappeared by 1810 due to its disruption by new diseases, a declining birth rate, and the impact of the mission system, during which the Costanoan were transformed from a hunter-gatherer society into agricultural laborers, until mission secularization (LECEF, 2001, p.10-12).

HISTORIC SETTING

The Port of Alviso was founded in the late 1840's and is not only one of the oldest ports on the West Coast, but was one of the first cities to be incorporated into California after it became a state (www.cachis.com/alviso/historicalnotes.html, 11/16/01). Greatly influenced by the boom of the California Gold Rush (1848), and the completion of the transcontinental railroad (1869) Alviso was, at its peak, the major commercial shipping depot in Northern California (Bard and Sharpe, 2001:13).

In 1876 an early farmer-settler named William Boots owned over 650 acres in the area, including the easternmost portion of the proposed U S DataPort (USDP)/LECEF project site. His residence was located off the site, just south of State Route 237. However, a former structure of this era was, at one time, located on the site (CH2M Hill, 2001:8.3-8). Buried historical remains such as privies, trash dumps, and wells associated with this structure could potentially exist on site.

The original site was comprised of the remnants of a large Chinese flower-growing complex built in the 1970's, and the Cilker Orchards, which is now barren with only a warehouse complex and the Cilker residence remaining. In total there were three

residences located within the U.S. Data Port project site (U.S. Dataport was a project approved but not built which included a generation facility; this lead to development of the current LECEF facility). They included the Cilker residence at 1657 Alviso-Milpitas Road built in 1923, 1591 Alviso-Milpitas Road, built in the 1940's which is located in the Cilker Orchard warehouse complex, and a now-demolished residence which was located in the southwestern corner of the project site. The residence at 1515A was demolished along with structures left over from the flower-growing complex.

RESOURCES INVENTORY

Literature and Records Search

A literature search was conducted for the proposed US DataPort project and also for the initial LECEF project (01-AFC-12). The search was completed at the California Historic Resources Information System (CHRIS). It covered the 34 acres where the LECEF site is located and included the proposed 13 acre laydown area. The search identified cultural resources within ½ mile of the project (LECEF 2003, p. 8.3-9).

The literature search revealed that numerous prehistoric sites have been recorded within a few miles of the project. Most of these sites were located near Coyote Creek or the Guadalupe River. There are previously recorded sites at 0.4 and 0.8 of a mile from the project. The result of the literature search indicated that the project area is sensitive for archaeological resources (LECEF 2003, p. 8.3-9).

Native American Contacts

As part of the background research for the initial LECEF project, the applicant contacted the Native American Heritage Commission (NAHC) via letter dated June 29, 2001, requesting information on sacred lands and ethnographically important sites and other properties that might be located in or near the project site or its components, as well as a list of Native American contacts with potential knowledge of the area. The NAHC responded in 2001 that they had no sacred sites listed in their data base and provided a list of five Native American contacts. The applicant contacted all of the Native American contacts via letter dated July 13, 2001 (01-AFC-12C) prior to the start of construction.

A second request was sent to the NAHC in December 2003 as part of the current LECEF 2, Phase 1 and 2 project (03-AFC-2). The NAHC responded with a list of Native American individuals and groups who wanted to be contacted regarding any additional construction disturbance in their area.

Field Surveys

The LECEF Phase 1 facility footprint and the 13-acre laydown area were surveyed for the USDP project EIR. Project areas not previously surveyed for the USDP EIR were surveyed by CH2MHill in 2001. The field survey of the USDP project site by Holman and Associates as reported by Wiberg (2000) resulted in non-significant findings. No significant historic archaeological remains were detected from surface examination of exposed soils. No historically or architecturally significant buildings or structures are present (LECEF 2003, p. 8.3-8 and Calpine c*Power, CH2M Hill, 2001, p. 8.3-14).

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize cultural resources by determining whether they meet sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the cultural resources and the methods and consultation required to mitigate any such impacts. Federal laws apply when a federal agency takes an action.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed as “significant” in accordance with federal guidelines need to be considered in analyzing potential impacts. The significance of historical and prehistoric cultural resources is based on the criteria for eligibility for nomination to the National Register of Historic Places (NRHP) as defined in Title 36, Code of Federal Regulations, section 60.4. If such resources are determined to be significant, and therefore eligible for listing in the NRHP, they are afforded certain treatment under the National Historic Preservation Act. If the resources are determined to be significant, and therefore eligible for the California Register of Historic Resources (CRHR), then mitigation measures are implemented under CEQA to reduce the impact to less than significant if possible. Federal agencies are responsible for meeting the requirements of NHPA and the Energy Commission is responsible for meeting the requirements of CEQA.

The National Register criteria state that “eligible historic properties” are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

a) are associated with events that have made a significant contribution to the broad patterns of our history; or

b) that are associated with the lives of persons significant in our past; or

c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) that have yielded, or may be likely to yield, information important to history or prehistory.

California has adopted a similar set of criteria for assessing resources for the CRHR. The CRHR criteria are noted as 1, 2, 3, and 4 while the NRHP criteria are noted as a, b, c, and d.

Under federal law, cultural resources determined not to be significant and that do not meet the eligibility criteria for the NRHP are subject to recording and documentation only and are afforded no further treatment. However, occasionally certain resources, although they may not be assessed as “significant,” may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. Energy Commission staff and involved federal agencies evaluate the survey reports and site records for any known resources located within or adjacent to

the project's Area of Potential Effects (APE) to determine whether they meet the eligibility criteria.

The record and literature search and the pedestrian surveys of the proposed project were conducted to identify the presence of any cultural resources. Where cultural resources were identified, additional evaluation was conducted to determine whether the resources are already listed on, or are potentially eligible for listing on either the NRHP [36 CFR 800] or the CRHR. The determination of eligibility is made in compliance with the applicable provisions of the NHPA.

CEQA Guidelines explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect "historical resources" (Cal. Code Regs., tit. 14. §15064.5). The guidelines provide a definition for historical resources and set forth a listing of criteria for making this determination (Cal. Code Regs., tit. 14 § 15064.5). These criteria are the eligibility criteria for the CRHR and are essentially the same as the eligibility criteria for the NRHP. In addition, as with the NRHP, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources eligible for the CRHR may have less integrity than the resources eligible for the NRHP. If the criteria are met and the resource is determined eligible for the CRHR, the Energy Commission must evaluate whether the project will cause a "substantial adverse change in the significance of the historical resource," which the regulation defines as a significant effect on the environment Cal. Code Regs., tit. 14 § 15064.5.

CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (PRC, § 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of an historical resource (Cal. Code Regs., tit. 14 § 15064.5).

Native American consultation for the LECEF Phase 2 proposed project has been completed. Ground disturbance will occur only in the current LECEF's 21-acre project area and potentially in the adjacent 13-acre laydown area (LECEF 2003, p.8.3-6).

ANALYSIS AND IMPACTS

A literature review and cultural resources inventory were completed for the USDP EIR (City of San Jose, 1999). LECEF's Phase 2 site, linear facilities and the proposed laydown area are located within the 55 acres originally surveyed for USDP EIR that was referenced as a primary source for cultural information for the original LECEF (01-AFC-12). The recommendations for mitigation in the USDP EIR applied to ground disturbance completed for the original LECEF, for the recently recertified Phase 1, and will also be applied to LECEF Phase 2. The recommendations are incorporated into the conditions of certification as mitigation.

Three residences within the USDP project site were constructed prior to 50 years ago (1657 Alviso-Milpitas Road built in 1923; 1515A and 1591 Alviso-Milpitas Road built in

the 1940s). These residences were evaluated by Randall Dean in May 2000 and were found to be “non-significant”. Peer review of this analysis conducted by Cal Trans in November 2001 confirmed those results. Based on historic and architectural evaluations on file with the City of San Jose, Department of Planning, Building and Code Enforcement, these residences are not eligible for listing in the CRHR, or the NRHP. In addition, they have been found to be “non-significant” under the City’s criteria for inclusion in the San Jose Historic Resources Inventory. It is therefore anticipated that there will be no project-related impacts to these resources. The 1515A Alviso-Milpitas Road structure was removed as part of the site preparation prior to construction of the original LECEF in 2001.

Since project development and construction usually entail surface and subsurface disturbance, the proposed Phase 2 has the potential to adversely affect both known and unknown cultural resources. Staff has analyzed the potential direct, indirect, and cumulative impacts from the proposed project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation or demolition. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or vandalism due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur.

PROJECT SPECIFIC IMPACTS

Only impacts to eligible cultural resources sites can be potentially significant. No known cultural resources that appear to meet the criteria for eligibility to the CRHR would be impacted by the project.

CUMULATIVE IMPACTS

The LECEF Phase 2 project site is located in an area that has been established in the above review as being highly sensitive for buried prehistoric and historic archaeological remains. Due to the rapid encroachment of commercial and residential development occurring in the San Jose area resulting in the loss of open space and research potential, there is a strong possibility that this site will yield archaeological information important to San Jose history. With the proper implementation of the proposed mitigation measures, and conditions of certification **CUL-1** through **CUL-11**, any cumulative impacts to known and previously unknown archaeological resources and the loss of knowledge that comes with the destruction of those resources, will be reduced to less than significant.

COMPLIANCE WITH APPLICABLE LORS

The City of San Jose has policies and goals and an eleven point plan for the protection of cultural resources. The City does not have any specific procedures for implementation of CEQA that differ from procedures used by the Energy Commission. The City of San Jose's requirements are consistent with CEQA and the proposed conditions of certification. Implementation of the mitigation measures recommended in the conditions of certification will ensure compliance with state and local LORS.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often however, avoidance cannot be achieved and other measures such as surface collection, subsurface testing, and data recovery must be implemented for archaeological resources and documentation must be implemented for historical structures. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

The US DataPort Draft and Final EIR (2001) required the implementation of proposed mitigation measures to avoid or reduce impact to cultural resources. These measures were implemented prior to ground disturbance associated with the LECEF Phase 1 and must continue to be implemented prior to ground disturbance associated with Phase 2. Conditions of certification **CUL-7** and **CUL-8** were designed to assure appropriate mitigation:

CUL-7 require that prior to any ground disturbance, a subsurface mechanical testing program for archaeological materials will be conducted over the entire site. Subsurface testing looks for buried or obscured prehistoric deposits. Backhoe trenches were to be excavated systematically at 30-meter intervals, and samples of excavated soils to be regularly screened. Soil logs and/or stratigraphic profiles for each trench are maintained. Mitigation intended in **CUL-7**, was required during the construction of the original LECEF (01-AFC-12), and condition of certification **CUL-5** continues to mitigate for any cultural resource discoveries.

CUL-8 requires that in the event of the discovery of any archaeological remains, either during preconstruction testing, or during construction, all construction within 50-feet of the find will be halted, the Compliance Project Manager and Director of Planning, Building and Code Enforcement will be notified, and the archaeologist will examine the find and make appropriate recommendations regarding the significance of the find and appropriate mitigation. Recommendations may include collection, recordation, and analysis.

The best mitigation strategy is to avoid impact to cultural resources that may be located in the project area. Avoidance can be accomplished by having the archaeologist and project engineer demarcate cultural resource site boundaries or by monitoring any construction activity on the ground to ensure that proposed project improvements do not impinge on the resource(s). Where a tower, road, or pipeline must be placed within 100-

feet of a known resource, the site can be temporarily fenced as an Environmentally Sensitive Area, or the cultural resource monitor can be present to be sure that no impacts occur to that resource.

APPLICANT'S PROPOSED MITIGATION

LECEF Phase 2 recommends that a Cultural Resources Specialist (CRS) and Cultural Resources Monitor (CRM) would be retained. The CRS would conduct a worker education session for construction supervisory personnel covering the importance and legal protection of significant archeological resources and the education session would be videotaped.

The cultural resources monitor would observe mechanical excavation in high sensitivity areas such as areas on or near stream terraces. If archeological resources are identified during construction the CRM, CRS and construction superintendent will be notified and construction in that area will be halted, if necessary. The CRS will delineate the area where construction is halted. Construction will remain halted until the CRS, in consultation with the Energy Commission staff, inspects and evaluates the discovery. If human remains are found, project officials will follow state law. The CRS and CRM will record all discoveries on Department of Parks and Recreation Form 523 (LECEF 2003, p. 8.3-8 to 8.3-13).

PROPOSED MITIGATION MEASURES

The USDP EIR recommended regarding mitigation for cultural resources that could be discovered by the project and impacted (Wiberg 2000, p. 9). Staff's proposed conditions of certification expand the applicant's proposed mitigation measures and incorporate recommendations from the USDP EIR to ensure compliance with law and mitigation of all impacts to below a significant level. The mitigation measures are incorporated into staff's proposed conditions of certification **CUL-1** through **CUL-11** presented below.

Staff's proposed conditions require implementation of the following measures:

CUL-1 requires that a qualified cultural resources specialist (CRS) manage cultural resources activities for the project. It also ensures that additional qualified specialists or cultural resources monitors would be retained as needed for the project. To ensure that cultural resources are adequately protected, **CUL-1** requires that the CRS have three years of experience in California. In addition to other relevant types of experience, the condition requires that the CRS have some background in data recovery.

CUL-2 requires the project owner to provide the CRS with maps and construction schedule information necessary to schedule monitors and cultural resources activity at the project site.

CUL-3 requires that a Cultural Resources Monitoring and Mitigation Plan (CRMMP) be developed that details all required activities that must be completed to reduce impacts to a level that is less than significant. The CRMMP defines the roles and responsibilities of cultural resources personnel and provides timelines for the completion of the required mitigation. The CRS would also obtain Native American monitors to observe work in areas where Native American artifacts are found. The CRMMP requires a discussion of

curation specifications, materials to be transferred to a curation facility, and the responsibility of the owner to pay all curation fees. A CRMMP was written and approved for LECEF Phase 1. Changes that are specific to LECEF Phase 2 will be reflected in an amendment to the CRMMP that is submitted to the CPM for approval. The amendment is required by **CUL-3**.

CUL-4 provides for worker environmental training. The training serves to instruct workers that halting construction is necessary if a potential cultural resource is discovered. It also provides them with instruction regarding applicable laws, penalties and reporting requirements in the event something is discovered. Workers are also instructed that the CRS and other cultural resources personnel have the authority to halt construction in the event of a discovery.

CUL-5 requires monitoring, including by Native American monitors where appropriate, of the ground disturbance for the project, linear facilities, and ancillary areas and a process for reducing monitoring to a level below full time. It also requires monitoring logs and weekly summaries of the monitoring activities. All non-compliance issues have to be reported to the CPM, and a reporting process is required. **CUL-6** ensures that unanticipated impacts to cultural resources are identified.

CUL-6 requires notification of staff within 24 hours of a cultural resources find. Timely notification enables staff participation in determinations of significance and the selection of appropriate mitigation to lessen impacts on cultural resources to a level that is less than significant.

The CRS, alternate CRS and the CRMs have the authority to halt work so that the Applicant has flexibility in construction scheduling. The CRS does not have to be at all active areas of construction at the same time.

CUL-7 requires an archeological testing program prior to earth disturbing activities or project site preparation. The program was required by the DataPort EIR. (This condition is not required for LECEF Phase 2 because the applicant has provided documentation stating that if any ground disturbance occurs in the laydown area it will be minimal and condition of certification **CUL-5** will apply.)

CUL-8 directs the project owner to ensure that the CRS conducts all the necessary cultural resources activities.

CUL-9 requires that the project owner provide a Cultural Resources Report (CRR) in Archaeological Resource Management Report format. This report would provide information on all field activities and the findings. The CRR would include all Department of Parks and Recreation 523 forms and cultural resource reports not previously provided to the California Historic Resource Information System (CHRIS). Copies of the CRR would be provided to the State Historic Preservation Officer, the CHRIS and the curating institution (if archaeological materials were collected).

CUL-10 ensures that artifacts and documents generated as a result of the project are appropriately curated.

CUL-11 requires that any necessary cultural resources surveys are completed prior to ground disturbance.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS AND RECOMMENDATION

No significant historical resources will be impacted as a result of LECEF Phase 2. In the event of an unanticipated discovery of any archaeological remains, implementation of the proposed mitigation measures and conditions of certification **CUL-1** through **CUL-11** will reduce potential impacts to less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and resume of its Cultural Resources Specialist (CRS), and an alternate CRS, if an alternate is proposed, who will be responsible for implementation of all cultural resources conditions of certification. No ground disturbance shall occur prior to CPM approval of the CRS, unless specifically approved by the CPM. ~~Approval of a CRS may be denied or revoked for non compliance on this or other projects.~~

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

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

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

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

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

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

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

4. The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary to this project and fulfills all the requirements of these conditions of certification. The project owner shall also ensure that the CRS obtains additional technical specialists, or additional monitors, if needed, for this project. The project owner shall also ensure that the CRS evaluates any cultural resources that are newly discovered or that may be effected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

Verification: 1). At least 45 days prior to the start of ground disturbance, the project owner shall submit the name and statement of qualifications of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

2.) If the CPM determines the proposed CRS to be unacceptable, the project owner shall submit another individual's name and resume for consideration. If the CPM determines the proposed alternate to be unacceptable, the project owner may submit another individual's name and resume for consideration. At least 10 days prior to the termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval.

3.) At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for cultural resource monitoring required by this condition. If additional monitors are obtained during the project, the CRS shall provide additional letters to the CPM, identifying the monitor and attesting to the monitor's qualifications. The letter shall be provided one week prior to the monitor beginning on-site duties. At least 10 days prior to beginning tasks, the resume(s) of any additional technical specialists shall be provided to the CPM for review and approval.

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

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

the CPM. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM. Maps shall identify all areas of the project where ground disturbance is anticipated.

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

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

4.) At a minimum, the CRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed. A current schedule of anticipated project activity shall be provide to the CRS on a weekly basis during ground disturbance and provided to the CPM in each Monthly Compliance Report (MCR).

Verification: 1.) At least forty days prior to the start of ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings.

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

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

4.)If there are changes to the scheduling of the construction phases of the project, a letter shall be submitted to the CPM within 5 days of identifying the changes.

5.)A copy of the current schedule of anticipated project activity.

CUL- 3 Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and approval a ~~A~~ Cultural Resources Monitoring and Mitigation Plan (CRMMP) identifying general and specific measures to minimize potential impacts to sensitive cultural resources has been approved by the CPM. Since changes and additions to the project, would make it necessary to amend the CRMMP, the amendment shall be submitted to the CPM for review and approval. The amendment shall identify cultural resources that may be treated programmatically. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site manager. No ground disturbance shall occur prior to CPM approval of the amended CRMMP, unless specifically approved by the CPM.

The CRMMP shall be submitted to the CPM for review, and the CPM must approve the ~~plan in writing~~ CRMMP, prior to any construction-related vegetation clearance or earth disturbing activities or project site preparation. After CPM approval of the plan, the project owner shall make the designated cultural resource specialist and designated cultural resource team available to implement the CRMMP as needed throughout project construction.

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

1. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials. Data sources shall be specified.

2. Discussion of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.

3. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.

4. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.

5. Incorporation of the Applicant's mitigation measures, as mandated by the USDP Draft EIR (2001).

6. A discussion of any measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

7. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the U.S. Secretary of Interior standards requirements for the curation of cultural resources.

8. A description of the set of reporting procedures prepared in concert with the project owner, to be used by all project personnel to notify the designated cultural resource specialist of any unexpected cultural resource discoveries during project construction.

9. A description of the work curtailment procedures prepared in concert with the project owner, to be used by all project personnel in the event of unexpected cultural resource discoveries during project construction.

10. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.

Verification: At least ~~30~~10 days prior to the start of project construction changes, related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide ~~the~~ to the CPM for review and ~~written~~ approval an amendment to the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist. The amendment may be submitted as an appendix to the CRMMP.

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

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a letter to the CPM stating that employees will not begin work until they have completed environmental training and that a sticker on hard hats will identify workers who have received training. Copies of acknowledgement forms signed by trainees shall be provided in the MCR.

CUL-5 1.) The project owner shall ensure that t~~T~~he CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linears and ground disturbance at laydown areas to ensure there are no impacts to undiscovered resources. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter providing a detailed justification for that decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

2.) Those individuals conducting cultural resources monitoring shall keep a daily log describing the construction activities, areas monitored, soils observed, and any cultural materials observed. The CRS may informally

discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

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

4.) A Native American monitor shall be obtained to monitor activities if ~~a~~ Native American archeological ~~site is~~ materials are discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored.

Verification: 1.) During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter or e-mail identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.

2.) During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the daily cultural resource monitoring reports. Copies of daily logs shall be retained.

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

4.) When ~~a~~ Native American archeological ~~site is~~ materials are discovered, the project owner shall send notification to the CPM identifying the person(s) retained to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-6 The designated cultural resource specialist or the specialist's delegated monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project construction-related vegetation clearance or earth disturbing activities or project site preparation or if known cultural resources will be affected in an unanticipated manner.

If any cultural resources are encountered, the project owner shall notify the CPM within 24 hours. Construction will not resume at the discovery site until all of the following have occurred:

1. The specialist has notified the CPM of the find and the work stoppage;
2. The ~~specialist~~ CRS, and the project owner, ~~and the~~ have consulted with the CPM ~~have conferred and determined what~~, and the CPM has concurred with the recommended eligibility of the discovery and proposed ~~if any~~, data recovery or other mitigation ~~is needed~~; and;
3. Any needed data recovery and mitigation has been completed.

The specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the specialist and team members shall monitor construction activities and implement data recovery and mitigation measures as needed.

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

Verification: At least 30 days prior to the start of project construction-related vegetation clearance or earth disturbing activities and site preparation; the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find. The project owner shall also provide to the CPM, for review and written approval, a set of work curtailment procedures to be followed in the event that previously unknown cultural resources are discovered during construction.

~~**CUL-7** Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation within the 13 acre laydown area, the project owner shall implement the archeological testing program as required by the US DataPort EIR. If resources are found, the applicant will notify the CPM in accordance with **CUL-6**. A complete Department of Parks and Recreation 523 form will be prepared. All testing and data recovery will be completed prior to the start of construction related ground disturbance.~~

Verification: ~~Seven days prior to implementing the testing program, the project owner shall provide the CPM with a letter indicating the schedule of the proposed testing, including maps showing where test trenches will be placed.~~

CUL-8 The project owner shall ensure that the designated cultural resource specialist performs the testing, recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of ~~all~~ cultural resource materials encountered and collected during pre-construction surveys, testing and during the monitoring, data recovery, mapping, and mitigation activities related to the project. Cultural resources materials shall be curated in accordance with the California State Historical Resources Commission "Guidelines for the Curation of Archaeological Collections" and the CRMMP including data sources identified in the research design.

Verification: If archeological materials are found, the project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate research specialists. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-9 After completion of the project, the project owner shall ensure that the CRS prepares a Cultural Resources Report (CRR) according to the Archaeological Resource Management Reports ~~(ARMR)~~ Guidelines as recommended by the California Office of Historic Preservation. The project owner shall submit the report to the CPM for review and approval. The report shall be considered final upon approval by the CPM.

Protocol: The CRR shall include (but not be limited to) the following:

A. For all projects:

1. Description of pre-project literature search, surveys, and any testing activities;
2. Maps showing areas surveyed or tested;
3. Description of any monitoring activities;
4. Maps of any areas monitored; and
5. Conclusions and recommendations.

B. For projects in ~~regarding~~ which cultural resources were encountered, include the items specified under “a” and also provide:

1. Site and isolated artifact records and maps;
2. Description of testing for, and determinations of, significance and potential eligibility; and
3. Research questions answered or raised by the data from the project.

C. For projects in which cultural resources were recovered, include the items specified under “a” and “b” and also provide:

1. Descriptions (including drawings and/or photos) of recovered cultural materials;
2. Results and findings of any special analyses conducted on recovered cultural resource materials;
3. An inventory list of recovered cultural resource materials; and
4. The name and location of the public repository receiving the recovered cultural resources for curation.

Verification: After completion of the project, the project owner shall ensure that the CRS completes the CRR within ninety days following completion of the analysis of the

recovered cultural materials. Within seven days after completion of the report, the project owner shall submit the CRR to the CPM for review and approval. Within 30 days after receiving approval of the CRR, the project owner shall provide to the CPM documentation that the report has been sent to the State Historic Preservation Officer and the appropriate archaeological information center(s).

CUL-10 If significant cultural resource deposits are encountered through testing or project monitoring, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources following the filing of the CPM-approved CRR with the appropriate entities. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all significant recovered cultural resource materials and a copy of the CRR are delivered for curation. Significance will be determined after consultation with the CPM. The project owner shall provide a copy of the transmittal letter received from the curation facility and provide a copy to the CPM within thirty days after receipt.

For the life of the project, the project owner shall maintain in its compliance files copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during testing, data recovery and mitigation for the project.

CUL-11 Prior to any additional project-related activities which may result in ground disturbance, the project owner must ensure that the area(s) to be impacted have been subject to a cultural resource surveys for this project, if current (within 5 years) surveys for those areas do not already exist.

The responsibility for the evaluation must be taken by persons meeting the Secretary of the Interior's Professional Qualification Standards in a discipline appropriate to the historic context within which the resource is being considered (OHP 1995).

If significant cultural resources will be affected, then mitigation measures will be determined in consultation with the CPM.

Verification: The project owner shall provide the results of any additional cultural resource surveys and evaluations in the form of a technical report (with request for confidentiality if needed), along with any associated maps, to the CPM at least thirty (30) before any project-related construction is to take place. All required mitigation will be completed prior to construction of the project-related activities.

REFERENCES

CEC (California Energy Commission) Community of Alviso website, 11/16/01. www.cachis.com/alviso/historicalnotes.html

City of San Jose, 2005. San Jose 2020 General Plan, pp. 103-104. Updated January 13, 2005, San Jose, CA.

City of San Jose, 2001. Draft and Final Environment Impact Statement, US DataPort Project. Approved April 3, 2001.

LECEF,LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2, Phase 1 and 2, Application for Certification (03-AFC-2). December 30, 2003.

Bard, Jim and James Sharpe, CH2MHill, 2001. A Cultural Resource Assessment of the Proposed Los Esteros Critical Energy Facility, Santa Clara County, California. By CH2M Hill, for Calpine c*Power.

Wiberg, Randy, 2000. Archaeological Reconnaissance of the U.S. Dataport Planned Development Rezoning EIR Project Area, on HWY 237 Between Coyote Creek and Zanker Road, City of San Jose, California. By Holman and Associates, for David J. Powers & Associates. May 2000.

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Geoffrey Lesh, P.E. and Rick Tyler

INTRODUCTION

The purpose of this staff analysis is to determine if the proposed Los Esteros Critical Energy Facility Phase 2 (LECEF) project complies with applicable laws, ordinances, and regulations (LORS), and has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Staff's **Worker Safety and Fire Protection** analysis portion of this document describes the requirements applicable to the protection of workers from such risks.

No acutely hazardous materials would be stored at the LECEF Phase 2 in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j). The use of the hazardous material, aqueous ammonia (19 percent ammonia in water), significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain and emissions are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, would be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project also involves the operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion.

The LECEF would also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

LAWS, ORDINANCES, REGULATIONS, STANDARDS, AND POLICIES

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

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499, §301,100 Stat. 1614 [1986]), also known as SARA Title III, contains the Emergency Planning and Community Right To Know Act (EPCRA) as codified in 42 U.S.C. §11001 et seq. This Act requires that certain information about any release to the air, soil, or water of an extremely hazardous material must be reported to state and local agencies. The Clean Air Act (CAA) of 1990 (42 U.S.C. §7401 et seq. as amended) established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The CAA section on Risk Management Plans - codified in 42 U.S.C. §112(r) - requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of the CAA are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

The California Accidental Release Prevention Program (Cal-ARP), implemented pursuant to Health and Safety Code, section 25531, directs facility owners storing or handling acutely hazardous materials in reportable quantities to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This program supersedes the California Risk Management and Prevention Plan.

Section 25503.5 of the California Health and Safety Code requires facilities which store or use hazardous materials to prepare and file a Business Plan with the local Certified Unified Program Authority (CUPA), in this case the County of Santa Clara, Department of Environmental Health. This Business Plan is required to contain information on the business activity, the owner, a hazardous materials inventory, facility maps, an Emergency Response Contingency Plan, an Employee Training Plan, and other recordkeeping forms.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

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

codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

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

LOCAL AND REGIONAL

The Uniform Fire Code (UFC 2000) contains provisions regarding the storage and handling of hazardous materials in Articles 4 and 79. The most recent version of the UFC was adopted in 2000.

The County of Santa Clara is the designated Certified Unified Program Authority (CUPA) and is responsible for administering Hazardous Materials Business Plans, Hazardous Materials Management Plans, Spill Prevention, Control, and Countermeasure Plans and RMP’s (LECEF 2003).

SETTING

The LECEF project site is located in San Jose, Santa Clara County, California at 800 Thomas Foon Chew Way. The facility is located within a 21-acre project site. The project site is contained within a 34-acre project parcel that also includes a vacant 13-acre parcel to the south of the project site that will be used for laydown and worker parking during the construction of Phase 2.

The project parcel is immediately north of State Route 237 and east of Zanker Road. To the east are an agricultural field, Coyote Creek, and the City of Milpitas. Immediately to the north of the parcel is a parcel owned by Silicon /valley Power (SVP) for a planned 230 kV switching station. North of the SVP parcel is the existing PG&E Los Esteros Substation. West and further north of the project site are open and undeveloped buffer lands surrounding the San Jose/Santa Clara Water Pollution Control Plant (WPCP). The WPCP is northwest of LECEF. Further north are the WPCP sludge drying ponds and yards. Site topography is characterized as generally flat with rolling foothills to the east. The terrain elevation is approximately 15 feet above mean sea level. The overall terrain in the vicinity is level. **Project Description** portion of this document for more details.

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

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

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

Recorded wind speeds and ambient air temperatures are described in the **Air Quality** section of the AFC (LECEF 2003, Section 8.1). Staff agrees with the applicant's use of F stability (stagnated air, very little mixing), 1.5 meters/second wind speed, and an ambient temperature of 98° F in its modeling analysis of an accidental release of aqueous ammonia (LECEF 2003, Section 8.5). This is an extremely conservative scenario and reflects worst-case atmospheric conditions.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. To the east, the terrain rises approximately 100-feet in 3 miles.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. The locations of sensitive receptors in the project vicinity are shown in Figures 8.9-1a and 8.9-1b of the AFC (LECEF 2003, Section 8.9). There are no sensitive receptors within a 1.3-mile radius.

ENVIRONMENTAL IMPACTS

Staff reviewed and assessed the potential for the handling and use of hazardous materials during both construction and operations to impact the surrounding community. All chemicals proposed for use at the LECEF 2, as well as natural gas, were evaluated.

METHODOLOGY

In order to assess the potential for released hazardous materials to travel off-site, and impact the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some chemicals must be used that are toxic. Therefore, staff conducted its analysis by examining the need for hazardous materials, the choice of chemical to be used and its amount, the manner in which the applicant will use the chemical, the manner it would be transported to the facility and transferred to facility storage tanks, and the way the applicant chooses to store the material on-site. Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or

mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that would help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to people.

Staff conducted a review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant (LECEF 2003, Section 8.5). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for use as listed in Table 8.5-2 and 8.5-5 of the AFC and determined the need and appropriateness of their use;
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment;
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs;
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews; and
- Step 5: Staff then analyzed the theoretical impacts on the public worst-case spill of hazardous materials even with the mitigation measures proposed by the applicant. If the mitigation methods proposed by the applicant were found to be sufficient, no further mitigation would be required. If the proposed mitigation proposed by the applicant were found to be insufficient to reduce the potential for adverse impacts to an insignificant level, staff would then propose additional prevention and response controls until the potential for causing harm to the public was reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

PROJECT IMPACTS

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form, in smaller quantities, have low mobility, or have low levels of toxicity.

In addressing the potential for impacts during the construction phase of the project, the only hazardous materials proposed for use include gasoline, fuel oil, hydraulic fluid,

lubricants, solvents, cleaners, sealants, welding flux, paint, and paint thinner. Any impact of spills or other releases of these materials would be limited to the site due to the small quantities involved and thus no further analysis of construction phase activities appears warranted. These chemicals would be present in very small quantities – and some are solids, thus posing an insignificant risk of off-site impacts. Therefore, these hazardous materials were eliminated from further consideration.

Continuing with the assessment for the operational phase, after removing from consideration those chemicals that fit into Steps 1 and 2, staff continued with Steps 3, 4 and 5 to review the remaining hazardous materials: hydrochloric acid, sodium hypochlorite, natural gas, sodium hydroxide, sulfuric acid, and aqueous ammonia.

Large Quantity Hazardous Materials

Hydrochloric acid

Hydrochloric acid, which is used in large quantities once every four years for the cleaning of the Heat Recovery Steam Generators (HRSG), does not pose a significant risk of off-site impacts because of the infrequent use and the safety measures taken by the HRSG cleaning company, including the use of temporary berms.

Sodium Hypochlorite

According to the AFC's Tables 8.5-2 and 8.5-5 (LECEF 2003), a total of 13,000 gallons of sodium hypochlorite would be stored at the site. Sodium hypochlorite has a low potential to affect the off-site public because its vapor pressure is low and it is in an aqueous solution. In fact, hypochlorite is used at many such facilities as a substitute for chlorine gas, which is much more toxic and much more likely to migrate off-site because it is a gas and is stored in concentrated form under pressure. Thus, the use of a water solution of sodium hypochlorite is much safer to use than the alternative chlorine gas. The amount of sodium hypochlorite that would be stored on the site is below the Reportable Quantity as defined in the Cal-ARP regulations. Based upon staff's knowledge about the use of this material and the modeling of accidental releases, an aqueous solution of sodium hypochlorite poses an insignificant risk to the off-site public. However, the chances for accidental spills during transfer from delivery vehicles to the storage tanks should still be reduced as much as possible. Thus, measures to prevent transfer spills are extremely important and would be required as a standard condition in a Safety Management Plan for delivery of sodium hypochlorite (see Condition of Certification **HAZ-3**).

Sodium Hydroxide

Sodium hydroxide would be stored on site but would not pose a risk of off-site impacts because it has relatively low vapor pressure and thus spills would be confined to the site. Therefore, no further analysis is needed.

Sulfuric Acid

Sulfuric acid would not pose a risk of off-site impacts, because it has a relatively low vapor pressure and thus emissions from spills would be confined to the site. Because of public concern at another proposed energy facility in 1995, staff conducted a

quantitative assessment of the potential for impact associated with sulfuric acid use, storage, and transportation. Staff found no hazard would be posed to the public. However, should a fire occur in the immediate vicinity of the sulfuric acid tank, the potential exists for the tank to rupture and for sulfuric acid to become vaporized and migrate off-site. In order to protect against risk of fire causing this accidental release, an additional condition of certification, **HAZ-6**, requires the project owner to ensure that no combustible or flammable materials would be stored within 100 feet of the sulfuric acid tank.

Natural Gas

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane, and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosions if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas. While natural gas would be used in significant quantities, it would 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.

In particular, gas explosions can occur in the HRSG and during start-up. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures would significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error.

The natural gas pipeline for the proposed Phase 2 facility is already constructed and in operation; it was completed as part of the original LECEF which began operation on March 7, 2003. No additional pipeline modifications are planned for Phase 2.

Aqueous Ammonia

Aqueous ammonia would be used at the LECEF 2 in controlling the emission of oxides of nitrogen (NO_x) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas. Two 10,000-gallon tanks would be used to store a maximum amount of 17,000 gallons of 19 percent aqueous ammonia solution (LECEF 2003). One of these tanks is already in use as part of the current LECEF. LECEF Phase 2 would add the second tank.

Based on the screening analysis discussed above, aqueous ammonia is one of the hazardous materials that may pose a risk of off-site impacts. The use of aqueous

ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia which would be used and stored on-site. However, as with aqueous sodium hypochlorite, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e., ammonia that is not diluted with water) poses far less risk.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm (recently changed from the 200 ppm value), which is also the RMP level 1 criterion used by U.S. EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff presumes that the potential release poses a risk of significant impact. However, staff also assesses the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether, the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact.

Applicant’s AFC (LECEF 2003, Section 8.5.4) provided the results of modeling for a worst-case accidental release of aqueous ammonia. The analysis assumed winds of 1.5 meters per second and atmospheric stability category F would exist at the time of the accidental release. An air temperature of 98º F was assumed. The SLAB (Ermak) air dispersion model was used to estimate airborne concentrations of ammonia. These analyses included many conservative assumptions, and were designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport.

The worst-case release is associated with a failure of one of the ammonia storage tanks releasing all of its content into the secondary containment area, and the alternative scenario is a failure of a supply truck loading hose spilling aqueous ammonia onto the truck unloading area.

The results indicated that concentrations exceeding 198 ppm in the worst-case scenario would be present at 45 feet, which is entirely limited to the project site. The nearest site fence line is 110 feet from the ammonia storage tanks. Staff’s own modeling indicates that concentrations of 75 ppm would be limited to the areas inside the site’s fence line so that there would be no off-site areas impacted by the 75-ppm concentration. Staff modeled the alternative scenario which involves loss of containment of ammonia from the delivery truck. Because the alternative scenario involves a smaller volume of spill and assumes meteorological conditions that would increase dispersion of the vapor cloud, the maximum distance for the 75 ppm concentration for that scenario would also be entirely within the site’s fence line.

There are no sensitive receptors (schools, hospitals, day care centers, etc.) in a one mile radius of the site. The nearest residences are located approximately 0.6 mile southwest, 0.8 mile east, and 1.4 miles southeast of the center of the project site.

Staff reviewed the applicant's modeling calculations and found that due to the engineering controls proposed to be implemented by the applicant for the storage and transfer of aqueous ammonia, any accidental release of aqueous ammonia used for the project would not cause a significant impact.

Seismic Issues

A hazardous materials spill could also occur during an earthquake, which would cause the failure of a hazardous materials storage tank. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, and neutralization systems. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. This concern over earthquake safety is heightened by the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan in January 1995.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be followed in adequately designing and building storage tanks and containment areas to withstand a large earthquake. Staff also reviewed the impacts of the February 2001, Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks were impacted by this quake. Referring to the sections on **Geologic Hazards** and **Facility Design** in the AFC, staff notes that the proposed facility will be designed and constructed to the applicable standards of CCR Title 24 and the 2000 Uniform Building Code for Seismic Zone 4. Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake with newer tanks, staff determined that tank failures during seismic events are not probable and do not represent a significant risk to the public.

Transportation of Hazardous Materials

Hazardous materials, including aqueous ammonia, sodium hypochlorite, and others would be transported to the facility via tanker truck or shipping trucks. While many types of hazardous materials would be transported to the site, staff has found that transport of aqueous ammonia poses the predominance of risk associated with such transport. If the risks of transporting this hazardous material is insignificant, all other transportation risks would be insignificant as well.

Although an accidental release of aqueous ammonia during transportation to an Energy Commission-certified gas power plant is extremely unlikely, it is possible for aqueous ammonia to be released during a transportation accident. The extent of impact in the

event of such a release would depend on the location and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

1. the skill of the tanker truck driver;
2. the type of vehicle used for transport; and
3. accident rate for hazardous materials transport trucks.

Staff routinely focuses on the surface streets within the project area after the delivery vehicle leaves the main highway. Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on main California Highways to ensure safe handling in general transportation (see The Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, The U.S. Department of Transportation Regulations 49 CFR Subpart H, §§172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence. (See AFC section 8.12.1.3 for additional information on regulations governing the transportation of hazardous materials.)

To address the issue of tank truck safety, aqueous ammonia would be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 6,500 gallons. These vehicles are designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. Staff has therefore proposed Condition of Certification **HAZ-5** to ensure that regardless of which vendor supplies the aqueous ammonia, delivery would be made in a tanker, which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on several references to determine the approach to preparing a hazardous materials transportation accident risk analysis (Rhyne, Davies, Harwood 1990, Harwood 1993, Vilchez, Pet-Armacost) supplemented with the following national data bases:

- National Response Center Data Base on chemical spills
- Chemical Incident Reports Center, U.S. Chemical Safety Board data base
- National Transportation Safety Board data base

Staff used this data and that from the Davies and Lee (1992) article, which references the 1990 Harwood study, to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The maximum usage of aqueous ammonia each year of operation of the proposed LECEF Phase 2 would require about 26 - 52 tanker truck deliveries of aqueous ammonia per year (one truck every 7 to 14 days; LECEF 2003, p. 8.5-16). Each delivery truck would travel about one-half mile between State Route (SR) 237 and the facility per delivery along the designated transportation route (Zanker Road, then Thomas Foon Chew Way). The result is a

maximum of 26 miles of delivery truck travel in the project area per year. Previous assessments by staff have found that the risk over this distance is negligible.

Data from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) was approximately 0.1 in one million.

Staff, therefore, believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

Site Security

This facility proposes to use hazardous materials which have been identified by the U.S. 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 2000a) and the U.S. Department of Justice published a special report on Chemical Facility Vulnerability Assessment Methodology (US DOJ 2002). In order to ensure that this facility or a shipment of hazardous material is not the target of unauthorized access, staff's proposed General Condition of Certification on Construction and Operations Security Plan **COM-8** in the **General Conditions** portion of this document would require the preparation of a Vulnerability Assessment and the implementation of Site Security measures consistent with the above-referenced documents.

The level of security should be dependent upon the threat imposed and the consequences of a successful breach of the facility boundaries. In order to determine the level of security, staff will provide guidance in the form of a decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002). Basic site security measures should be required at all locations in order to protect the infrastructure and electrical power generation within the state. These measures will include perimeter fencing, guards, alarms, law enforcement contact in the event of security breach, and fire detection systems. Other locations will have additional security measures dependant upon the results of the vulnerability assessment.

The level of security to be implemented at each power plant is a function of the likelihood of an adversary attack, the likelihood of adversary success in causing a catastrophic event, and the severity of consequences of that event. It is only after

conducting a vulnerability assessment that the level of security required will be known. The vulnerability assessment will be based, in part, on the use and storage of certain quantities of acutely hazardous materials as described by the California Accidental Release Prevention Program (Cal-ARP - Health and Safety Code, section 25531). This will allow staff to use the results of the off-site consequence analysis prepared as part of the Risk Management Plan (RMP) to determine the severity of consequences of a catastrophic event.

Site personnel background checks will be required for this site and will most likely be limited to ascertaining that the employee's claims of identity and employment history are accurate. All site personnel background checks would be consistent with state and federal law regarding security and privacy.

Site access for vendors should be strictly controlled. Consistent with recent state and current 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 conduct background security checks on any employee involved in the transportation and delivery of hazardous materials to the power plant. This requirement will be similar to those conditions of certification which require a project owner to ensure that hazardous materials deliveries are made only in approved vehicles and only via an approved delivery route. All hazardous materials vendor delivery personnel background checks would be consistent with state and federal law regarding security and privacy.

CUMULATIVE IMPACTS

Staff reviewed the potential for the operation of the LECEF Phase 2 combined with any existing or planned industrial facilities to result in cumulative impacts on the population within the area. Projects that could potentially contribute to cumulative impacts are those located or which will be located in the same geographic area of influence defined as within a 1-mile radius of the proposed power plant. Currently, the Water Pollution Control Plant (WPCP) is within one mile of the LECEF proposed Phase 2 site.

As LECEF Phase 2 does not present a significant potential for impacts beyond its boundaries, it does not present significant potential to contribute to cumulative impacts with other sources including the WPCP.

Staff finds that the LECEF Phase 2 as-proposed with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in off-site impacts. It is also extremely unlikely that an accidental release that has very low probability of occurrence (about one in one million per year) would independently occur simultaneously at the Phase 2 site and another facility at the same time.

APPLICANT'S PROPOSED MITIGATION

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Administrative controls include the

development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

ENGINEERING CONTROLS

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- constructed curbs, berms, and/or catchment basins in the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- constructed below-grade spill containment vault;
- process protective systems including continuous tank level monitors, alarms, automatic shut-off valves, and fire protection systems.

ADMINISTRATIVE CONTROLS

Administrative controls also help to prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs and process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program proposed by the applicant for use at this facility would include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner would designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

The facility's Safety Management Program would include regular inspection and maintenance of equipment, valves, piping, and appurtenances. Additionally, the safety management program requires that only trained facility personnel are assigned to the transfer and handling of hazardous chemicals. LECEF Phase 2 would also prepare a Hazardous Materials Business Plan and a Risk Management Plan (RMP).

In order to address the issue of spill response, LECEF Phase 2 would prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation; spill cleanup, hazard prevention, and emergency response.

STAFF'S PROPOSED MITIGATION

Staff proposes eight conditions of certification mentioned throughout the text (above) and listed below. **HAZ-1** ensures that no hazardous material would be used at the facility except those listed in the AFC unless there is prior approval by the County and the Energy Commission Compliance Project Manager (CPM). **HAZ-2** requires that a RMP be prepared and submitted prior to the delivery of aqueous ammonia. The worst-case accidental release scenario evaluated in the AFC assumed that accidental spills of aqueous ammonia would occur from the storage tank into the catchment system. Staff believes that the most likely event resulting in a spill would be during transfer from the delivery tanker to the storage tank. Staff therefore proposes a condition (**HAZ-3**) requiring development of a safety management plan for the delivery of aqueous ammonia (as well as aqueous hypochlorite solution). The development of a Safety Management Plan addressing delivery of ammonia would further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required Risk Management Plan (RMP). **HAZ-4** requires that the aqueous ammonia storage tank be designed to certain rigid specifications, **HAZ-5** addresses the transportation of aqueous ammonia, and **HAZ-6** addresses the safety of the sulphuric acid storage tank.

FACILITY CLOSURE

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

CONCLUSIONS AND RECOMMENDATIONS

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that routine use of hazardous materials would pose little potential for significant impacts to the public.

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

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in any quantity or strength not listed in AFC Tables 8.5-2 and 8.5.5 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 (if required by regulation) and a Hazardous Materials Business Plan HMBP (which shall include the proposed building chemical inventory as per the AFC) to the Santa Clara County and the CPM for review at the time the RMP plan is first submitted to the U.S. Environmental Protection Agency (EPA), if required. The project owner shall include all recommendations of the Santa Clara County and the CPM in the final documents. A copy of the final plans, including all comments, shall be provided to the City of San Jose and the CPM.

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

HAZ-3 The project owner shall update the Safety Management Plan for delivery of aqueous ammonia associated with Phase 2 and shall submit this plan to the CPM for approval. 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 60 days prior to the delivery of aqueous ammonia to the facility that is specified for use in Phase 2 operations, the project owner shall provide the plan to the CPM for review and approval.

HAZ**-4** The aqueous ammonia storage facility shall be designed to both the ASME Pressure Vessel Code and ANSI K61.6, or to API 620. In either case, the storage tank(s) shall be protected by a secondary containment basin capable of holding 110% of the primary container if a single container is used, or in the case of multiple containers, 150% of the volume of the largest container. In

addition, the secondary containment, if open to rainfall, must accommodate the volume associated with 24 hours of rain assuming the 25-year storm. The final design drawings and specifications for the ammonia storage tank(s) and secondary containment basin shall be submitted to the CPM.

Verification: At least 60 days prior to delivery of aqueous ammonia to the facility that is specified for use in Phase 2 operations, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

HAZ-5 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only transport vehicles that meet or exceed the specifications of DOT Code MC-307.

Verification: At least 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**-6** The project owner shall ensure that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

Verification: At least 30 days prior to receipt of sulfuric acid onsite, 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.

REFERENCES

AIChE (American Institute of Chemical Engineers). 1989. Guidelines for Technical Management of Chemical Process Safety, AIChE, New York, NY 10017.

AIChE (American Institute of Chemical Engineers). 1994. Guidelines for Implementing Process Safety Management Systems, AIChE, New York, NY 10017.

API (American Petroleum Institute). 1990. Management of Process Hazards, API Recommended Practice 750; American Petroleum Institute, First Edition, Washington, DC, 1990.

Baldcock, P.J. (date unknown). Accidental Releases of Ammonia: An Analysis of Reported Incidents. (unknown source).

Davies, P.A. and Lees, F.P. 1992. “The Assessment of Major Hazards: The Road Transport Environment for Conveyance of Hazardous Materials in Great Britain.” Journal of Hazardous Materials, 32: 41-79.

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

Ermak, D.E. (1990) User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-Than-Air Releases, Lawrence Livermore National Laboratory, Livermore, CA, 1990.

FEMA (Federal Emergency Management Agency). 1989. Handbook of Chemical Hazard Analysis Procedures, Federal Emergency Management Agency, Washington, DC, 1989.

Harwood, D.W., Viner, J.G., and E.R. Russell. 1990. "Truck Accident Rate Model for Hazardous Materials Routing." Transportation Research Record. 1264: 12-23.

Harwood, D.W., Viner, J.G., and E.R. Russell. 1993. "Procedure for Developing Truck Accident and Release Rates for Hazmat Routing." Journal of Transportation Engineering. 119(2): 189-199.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

Lees, F.P. 1998). Loss Prevention in the Process Industries, Vols. I, II and III. Second Edition, Butterworths.

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

NRC (National Research Council). 1979. Ammonia. Subcommittee on Ammonia. Committee on Medical and Biologic Effects of Environmental Pollutants. Division of Medical Sciences, Assembly of Life Sciences, National Research Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).

Pet-Armacost, J.J., Sepulveda, J. and M. Sakude. 1999. "Monte Carlo Sensitivity Analysis of Unknown Parameters in Hazardous Materials Transportation Risk Assessment." Risk Analysis. 19(6): 1173-1184.

Rhyne, W.R. 1994. Hazardous Materials Transportation Risk Analysis. Quantitative Approaches for Truck and Train. ,Chapter 2: Transportation Quantitative Risk Analysis, and Chapter 3: Databases

Uniform Fire Code (UFC) 2000. International Fire Code Institute, Whittier, Ca.

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

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

Vilchez, J.A., Sevilla, S., Montiel, H. and J. Casal. 1995. "Historical Analysis of Accidents in Chemical Plants and in the Transportation of Hazardous Materials." J. Loss Prev. Process Ind. 8(2): 87-96.

APPENDIX A

HAZARDOUS MATERIAL MANAGEMENT

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

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

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

HAZARDOUS MATERIAL MANAGEMENT
APPENDIX A TABLE 1
Acute Ammonia Exposure Guidelines

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

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)
* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.
** The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

References for Appendix A, Table 1

AIHA. 1989. American Industrial Hygienists Association, Emergency Response Planning Guideline, Ammonia, (and Preface) AIHA, Akron, OH.

EPA. 1987. U.S. Environmental Protection Agency, Technical Guidance for Hazards Analysis, EPA, Washington, D.C.

NRC. 1985. National Research Council, Criteria and Methods for Preparing Emergency Exposure Guidance Levels (EEGL), short-term Public Emergency Guidance Level (SPEGL), and Continuous Exposure Guidance Level (CEGL) Documents, NRC, Washington, D.C.

NRC. 1972. Guideline for short-term Exposure of The Public To Air Pollutants. IV. Guide for Ammonia, NRC, Washington, D.C.

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

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

Abbreviations for Appendix A, Table 1

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

Appendix B

AFC Table 8.5-2. **Chemical inventory, Phase 1 simple-cycle operation.**

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Aqueous Ammonia (19% solution)	Ammonium Hydroxide	1336-21-6 (for NH_4-OH)	10,000-gal.	1,000 lb.	5,000 lb.	[d]	No
Cleaning Chemicals/Detergents	Various	None	20 gal.	[d]	[d]	[d]	No
SUVA 123	Dichlorotrifluoroethane	306-83-2	9,360 lb.	[d]	[d]	[d]	No
Dielectric Insulating Oil (Hyvolt II, Diala Oil AX)	Severely hydrotreated light napthenic distallate	64742-53-6	35,262 gal.	42 gal.[e]	[f]	[d]	No
Diesel Fuel	Oil	None	320 gal.	42 gal.[e]	[f]	[d]	Yes
Laboratory Reagents (liquid)	Various	None	20 gal.	[d]	[d]	[d]	No
Laboratory Reagents (solid)	Various	None	100 lb.	[d]	[d]	[d]	No
Lubrication Oil	Oil	None	6,500 gal.	42 gal.[e]	[f]	[d]	Yes
Lubricating Oil, Synthetic (Royco)	Pentaerythritol Esters	68424-31-7	710 gal.	42 gal.[e]	[f]	[d]	No
NALCO 2584	Sulfurous Acid, Monosodium Salt	7631-90-5	40 gal	[d]	[d]	[d]	No
	Sodium Hydroxide	1310-73-2					
	Potassium Hydroxide	1310-58-3					
	Potassium Bisulfite	7773-03-7					
NALCO 7396	Tetrapotassium Pyrophosphate (60 to 100%)	7320-34-5	400 gal.	[d]	[d]	[d]	No
NALCO 8338	Sodium nitrite	7632-00-0	20 gal.	410 lb.	130 gal.	[d]	No
	Sodium tolyltriazole	64665-57-2		[d]	[d]	[d]	
	Sodium hydroxide	1310-73-2		[d]	[d]	[d]	
NALCO TRASAR 23263	Non-hazardous	None	400 gal.	[d]	[d]	[d]	No

AFC Table 8.5-2. **Chemical inventory, Phase 1 simple-cycle operation.**

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Phosphonate (e.g. VITEC 3000)	Phosphonic Acids (45-50%)	Various	70 gal.	[d]	[d]	[d]	No
Sodium Bisulfite (e.g. NALCO 7408)	Sodium Bisulfite (40 to 70%)	7631-90-5	60 gal.	5,000 lb.	7,143 lb.	[d]	No
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (12%)	7681-52-9	5,000 gal.	100 lb.	1,000 lb.	[d]	No
Sulfuric Acid	Sulfuric Acid (93 to 98%)	7664-93-9	5,000 gal.	1,000 lb.	1,075 lb.	[d]	No
	Battery Acid (<30%)	7664-93-9	2,200 gal.	1,000 lb.	3,333 lb.	[d]	No

[a]Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.
[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10 percent of a reportable chemical and the RQ is 100 lbs., the reportable quantity for that material would be (100 lbs.)/(10%) = 1,000 lbs.
[c] Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.
[d] No reporting requirement. Chemical has no listed RQ or TPQ.
[e] State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)]
[f] Per the California Water Quality Control Board Region 2, they would like all oil spills to surface water reported, even for less than the state reportable quantity of 42 gal.
[g] Some of the chemicals have alternatives (See Table 8.5-1), thus the maximum quantity stored onsite can be zero if an alternative chemical is being used.

AFC Table 8.5-5. **Phase 2 chemical inventory (in addition to Phase 1).**

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65
Acutely Hazardous Materials							
NALCO 356	Cyclohexylamine (10 to 30%) Morpholine (5 to 10%)	108-91-8 110-91-8	400gal.	10,000 lb.	33,333 lb.	10,000 lb.	No
Hazardous Materials							
Aqueous Ammonia (19% solution)	Ammonium Hydroxide	1336-21-6 (for NH_4-OH)	10,000-gal.[e]	1,000 lb.	5,000 lb.	[d]	No
Fyrquel 550	Triphenyl Phosphate	115-86-6	250 gal.	[d]	[d]	[d]	No
ISO VG-32 (hydraulic fluid)	Non-hazardous	None	3,600 gal.	[d]	[d]	[d]	No
NALCO 2833	Sodium Hydroxide (1 to 5%) Sodium Nitrite (10 to 30%) Sodium Molybdate (1 to 5%)	1310-73-2 7632-00-0 7631-95-0	55 gal.	[d] 410 lb. [d]	1367 lb.	[d]	No
NALCO 7342	Sodium bromide	7647-15-6	1,500 gal.	[d]	[d]	[d]	No
NALCO 7346	1,3-Dichloro-5,5-Dimethylhydantoin 1-Bromo-3-Chloro-5,5-Dimethyl-Hydantoin 1,3-Dichloro-5-Ethyl-5-Methylhydantoin	118-52-5 16079-88-2 89415-87-2	5 pails	[d]	[d]	[d]	Yes
NALCO 7396	Tetrapotassium Pyrophosphate (60 to 100%)	7320-34-5	400 gal.[e]	[d]	[d]	[d]	No
NALCO 8305+	Sodium tolyltriazole (1 to 5%)	64665-57-2	1,500 gal.	[d]	[d]	[d]	No
NALCO BT-3000	Sodium Hydroxide (1 to 5%) Sodium Tripolyphosphate (1 to 5%)	1310-73-2 7758-29-4	400 gal.	1000 lb. [d]	20,000 lb	[d]	No
NALCO ELIMIN-OX	Carbohydrazide	497-18-7	400 gal.	[d]	[d]	[d]	No
NALCO TRASAR 23263	Non-hazardous	None	1,500 gal.[e]	[d]	[d]	[d]	No
Sodium Hydroxide	Sodium Hydroxide (50%)	1310-73-2	800 gal.	1,000 lb.	2,000 lb.	[d]	No
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (12.5%)	7681-52-9	8,000 gal.	100 lb.	800 lb.	[d]	No
Sulfuric Acid	Sulfuric Acid (93 to 98%)	7664-93-0	6,000 gal.	1,000 lb.	1,020 lb.	[d]	No

AFC Table 8.5-5. **Phase 2 chemical inventory (in addition to Phase 1).**

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ[a]	RQ of Material as Used Onsite[b]	LaFollette Bill TPQ[c]	Prop 65

[a]Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

[b] Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures containing only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material contains 10 percent of a reportable chemical and the RQ is 100 lbs., the reportable quantity would be (100 lbs.)/(10%) = 1,000 lbs.

[c] Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

[d] No reporting requirement. Chemical has no listed RQ or TPQ.

[e]These materials are currently used for Phase 1. The quantities shown represent an on-site increase for Phase 2.

LAND USE

Testimony of James Adams

INTRODUCTION

The land use analysis for Phase 2 of the Los Esteros Critical Energy Facility (LECEF, 03-AFC-2) focuses on the project's compatibility with existing and planned land uses (including recreational and agricultural uses), and its consistency with applicable land use plans, ordinances and policies. The major activity for the Phase 2 project is converting the existing simple-cycle Los Esteros power plant to a combined-cycle facility. An extensive land use analysis for the simple-cycle plant is contained in the original LECEF (01-AFC-12) Final Staff Assessment (CEC, 2001) and the Commission's Decision for that initial Los Esteros project (CEC, 2002). These documents are incorporated by reference in this analysis.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

LOCAL

Local land use laws, ordinances, regulations and standards (LORS) applicable to the proposed project include the City of San Jose General Plan and Zoning Ordinance, the Alviso Master Plan (i.e., a subset of the General Plan), and the City of San Jose Riparian Corridor Policy Study. The applicable land use LORS are summarized in **Land Use Table 1**.

Land Use Table 1 summarizes relevant policies from the City General Plan, Alviso Master Plan, the Riparian Corridor Policy Study, and provides a brief description of their purpose and intent. The City of San Jose Zoning Ordinance is also listed due to its role as the major tool for implementing these policies. The Zoning Ordinance provides detailed specifications for allowable development within area designated by the General Plan.

SETTING

PROJECT LOCATION

LECEF PHASE 2 Location and Site Characteristics

The LECEF Phase 2 site is located in northern San Jose within Santa Clara County, California, at 800 Thomas Foon Chew Way. The site is:

- north of State Road 237,
- east of Zanker Road and the San Jose/Santa Clara Water Pollution Control Plant (WPCP),
- west of Coyote Creek and the adjacent flood control channel, and
- south of the WPCP's sludge drying pools.

The proposed Phase 2 project would be located within the boundaries of the original LECEF project property, a 34-acre parcel which includes a vacant 13-acre site adjacent to the south sound wall of the existing LECEF facility.

Land Use Table 1
Land Use Policies Relevant to the Proposed Project

Relevant Policy	Description
City of San Jose General Plan	
Economic Development Major Strategy	Strives to make San Jose a more "balanced community" by encouraging commercial and industrial growth to balance existing residential development.
Greenline Major Strategy	Directs the "preservation of the scenic backdrop of the hillsides surrounding San Jose, reserving land that protects water, habitat, or agricultural resources and offers recreational opportunities".
Sustainable City Major Strategy	Mandates a "sustainable city, [which] is a city designed, constructed, and operated to minimize waste, efficiently use its natural resources, and to manage and conserve them for the use of present and future generations".
Industrial Land Use 1	"Industrial development should incorporate measures to minimize negative impacts on nearby land uses".
Urban Design Policy 1	"The City should continue to apply strong architectural and site design controls on all types of development for the protection and development of neighborhood character and for the proper transition between areas with different types of land uses"
Urban Design Policy 7	The City should require the undergrounding of distribution utility lines serving new development sites as well as proposed redevelopment sites. The City should also encourage programs for undergrounding existing overhead distribution lines. Overhead lines providing electrical power to light rail transit vehicles and high-tension electrical transmission lines are exempt from this policy.
Urban Design Policy 24	New development projects should preserve significant trees, and any adverse affects should be avoided through appropriate design measures and construction practices. When tree preservation is not feasible, the project should include appropriate tree replacement.
Tree Removal Controls	Protects native and non-native with trunks measuring 56 inches or more in circumference, 24 inches above the natural grade of slope. A tree removal permit usually requires the replacement of trees on a 3:1 or 4:1 ratio, as dictated by consultations with the City.
Scenic Routes and Trails Diagram	Due to the City's diverse natural environment, the City has: "many scenic and recreational opportunities…The Scenic Routes and Trails Diagram identifies the City's most outstanding natural amenities and establishes guidelines to develop and preserve these resources…Scenic routes, trails and pathways are incorporated into a single plan because they share many of the same characteristics and locations…They all provide scenic views of the natural areas of the City and are linear in form…Because these designations strive for many of the same objectives they sometimes overlap and are incorporated into corridors that provide access to both scenic resources and outdoor recreational opportunities". Urban Throughways are designated on the Scenic Routes and Trails Diagram and they include "all State and Interstate Highways that traverse through the City's Sphere of Influence". Trails and Pathways Corridors are "the interconnecting trail system in the City, providing many important access links to the regional parks and open spaces in or adjoining the City. The Scenic Routes and Trails Diagram indicates these focal points and designates the most feasible and accessible rotes to develop trails.
Trails and Pathways Policy 1	New development adjacent to the Trails and Pathways Corridors should not compromise safe trail access nor detract from the scenic and aesthetic qualities of the corridor.
Trails and Pathways Policy 2	When new development occurs adjacent to a designated Trails and Pathways Corridor, the City should encourage the developer to install and maintain the trail.
Riparian Corridor Policy 4	"New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone."
Hazards Policy 2	Levels of "acceptable exposure to risk" established for land uses and structures based on descriptions of land use groups and risk exposure levels should be considered in the development review process.
Soils and Geologic Conditions Policy 1	The City should require soils and geologic review of development proposals to assess potential hazards relating to seismic activity, surface ruptures, liquefaction, landslides, mudslides, erosion and sedimentation.
Soils and Geologic Conditions Policy 3	In areas susceptible to erosion, appropriate control measures should be required in conjunction with proposed development.
Soils and Geologic Conditions Policy 6	Development in areas subject to soils and geologic hazards should incorporate adequate mitigation measures.
Soils and Geologic Conditions Policy 8	Developments proposed within areas of potential geological hazards should not be endangered by, nor contribute to, the hazardous conditions on the site or on adjoining properties.

Relevant Policy	Description
Earthquake Policies 3	The City should only approve new development in areas of identified seismic hazard if such hazard can be appropriately mitigated.
Earthquake Policies 5	The City should continue to require geotechnical studies for development proposals; such studies should determine the actual extent of seismic hazards, optimum location for structures, the advisability of special structural requirements, and the feasibility and desirability of a proposed facility in a specified location.
City of San Jose: Alviso Master Plan – A Specific Plan For The Alviso Community	
Community Character Policy 2	New developments should have architectural and landscaping qualities that maintain the "seaside" qualities of Alviso.
Industrial/ Non-Industrial Relationships Objective	Setbacks and buffers should be established to protect environmental resources (e.g., Coyote Creek) and "sensitive uses" (e.g., residential, day care, and school uses) from potential negative impacts of industrial use.
Industrial /Non-Industrial Relationships Policy 2	The Light Industrial areas located north of State Street and adjacent to Coyote Creek should mitigate potential negative environmental impacts to nearby natural resources.
Environmental Protection Policy 1	All new parking, circulation, loading, outdoor storage, utility, and other similar activity areas must be located on paved surfaces with proper drainage to avoid potential pollutants from entering the groundwater, Guadalupe River, Coyote Creek, or San Francisco Bay.
Environmental Protection Policy 3	The riparian corridors adjacent to Coyote Creek and Guadalupe River should be preserved intact. Any development adjacent to the waterways should follow the City's Riparian Corridor Policies.
Environmental Protection Policy 5	To protect aquatic habitats that receive storm runoff, all new development must comply with adopted City Council policy entitled "Post-Construction Urban Runoff Management."
Lands Outside of the Village Area Design Objective	Given the high visibility of most of this area, development should be attractive, should fit in the context of the larger community, and should reflect some of the elements and materials of seaside styles to contribute to Alviso's sense of place.
Lands Outside of the Village Area Design Objective – Industrial Development Guidelines	Building heights may only exceed the 45-foot limit if they are located next to State Route 237 and the additional height of the building (up to 90 feet) is coupled with preserved habitat areas on the northern portions of the site.
Landscaping Policy 3	Landscaping should be used to screen unattractive uses and soften the effect of taller buildings due to the flood protection requirements.
Storm Drainage Policy 1	All new development projects should be evaluated to determine the possible need for additional storm drainage facilities.
City of San Jose: Riparian Corridor Policy Study	
Guideline 1A: Orientation	Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges.
Guideline 1C: Setback Areas	All buildings, other structures, impervious surfaces, outdoor activity areas, and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater).
Guideline 2F: Noise	Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.
Planned Development Zoning	City of San Jose: Zoning Ordinance

Linear Facilities

Phase 2 will have two aerial 200-foot-long 230 kV transmission lines that will connect with the recently-constructed Silicon Valley Power (SVP) switching station built on a strip of land just north of the LECEF plant, and south of the existing PG&E Los Esteros Substation. There are no additional linear facilities planned for the Phase 2 project.

SURROUNDING LAND USES AND DESIGNATIONS

The surrounding land uses and designations have not changed substantially since the land use analysis was conducted for the original LECEF (01-AFC-12) project (CEC, 2001). Agricultural uses are located to the north, west, and east. There are office park light industrial areas to the east of the facility as well as new office buildings south of

SR-237. Industrial facilities are located along the I-880 corridor in the City of Milpitas and further south along Zanker Road in San Jose (LECEF 2003, p. 8.6-4).

PLANNED LAND USE - US DATAPORT CAMPUS

According to the AFC, LECEF was originally envisioned as part of a 174-acre planned development originally proposed for the U.S. Dataport (USDP) project, an internet information service campus. It would surround the LECEF site on the former Lin-Hom and Ciker properties. Currently, construction of the USDP project has been delayed due to slow economic conditions and an oversupply of internet information service facilities. Should the USDP project be built, LECEF will provide highly reliable power (LECEF 2003, p. 8.6-4).

RECREATIONAL FACILITIES

Bicycle Paths and Trails

In November 2002, the City of San Jose Planning Department amended the Circulation Element of the San Jose General Plan regarding trails and bike paths to make it consistent with guidelines and maps developed by the San Jose Parks and Recreation Department. Fifteen new trails were incorporated into the General Plan Scenic Routes and Trails Diagram. The two closest to the LECEF site are an alternate route that connects the San Francisco Bay Trail with the Coyote Creek Trail (1750 feet north of the project site), and the Highway 237 Bike Trail (700 feet south of the LECEF site (City of San Jose, 2004c, Pgs. 3 & 4). This latter bike trail has sustained significant damage at some point in time since the 2001 filing of the original LECEF AFC (01-AFC-12). The applicant, in response to inquiries from the Silicon Valley Bicycle Coalition, initiated discussions with the City of San Jose, PG&E, and SVP regarding repair of this segment of the bike path. The City of San Jose, Department of Transportation, Bicycle/Pedestrian Program has taken the lead in developing a repair plan, securing cost estimates and working with the applicant and others to insure that the repairs are funded and completed. While the applicant is not liable for the repairs, they are cooperating with the City to complete these repairs as a good neighbor in the community.

ANALYSIS OF IMPACTS

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

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disrupt or divide the physical arrangement of an established community; or
- convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use.

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

CONFLICT AND CONFORMANCE WITH ANY APPLICABLE LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Public Resources Code § 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the commission make any finding in conflict with applicable federal law or regulation. When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (§ 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the LECEF Phase 2 project is consistent or at variance with each requirement or standard.

Project site

Alviso Master Plan

As defined in the Alviso Master Plan, the land use designation for the project site is *Light Industrial (LI).* According to the General Plan, the LI land use designation allows a wide variety of industrial uses (such as warehousing, wholesaling, light manufacturing, and industrial service and supply businesses) as long as any hazardous or nuisance effects are mitigated. Only low-intensity uses (defined as those with low employment densities) are permitted in the LI areas near Coyote Creek (City of San Jose Alviso Master Plan, 1998). Given the small number of operational employees and the applicant's intent to mitigate for air emissions and other potential impacts, staff has concluded that the project is consistent with the light industrial designation, and compatible with other light industrial uses in the area.

Alviso Master Plan land use policies that are relevant to the proposed project are presented in **Land Use Table 1**.

City of San Jose Zoning Ordinance

On March 14, 2001, the San Jose City Planning Commission certified the US Dataport Planned Development Zoning Project EIR and recommended approval of the project to the San Jose City Council. On April 3, 2001, the City Council, acting as the CEQA Lead Agency, approved the US Dataport Planned Development Zoning Project, and adopted an ordinance (No. 26343) to prezone and rezone the US Dataport site, which includes the proposed LECEF project site (LECEF, 2001). As noted above, under the Planned Land Use heading, the U.S. Dataport project has not been built.

The San Jose City Council adopted this zoning on March 5, 2002, which became effective April 5, 2002. However, that adoption was based on the development of the LECEF simple-cycle project at 180 MW net output. Phase 2 will add an additional 140 MW in generation, for a total electrical output of 320 MW. Therefore, the zoning requirements need to be amended.

The LECEF applicant has submitted a preliminary filing with the City of San Jose to pursue a conforming rezone. City of San Jose staff reviewed the filing, provided comments, and the applicant prepared and filed, in March of 2005, a final Rezone Application. City staff is currently reviewing the final application. The City plans to use the Energy Commission staff's Final Staff Assessment as their California Environmental Quality Act (CEQA) equivalent document (City of San Jose 2004a). The City of San Jose Planning Department intends to have the rezoning application heard by the Planning Commission in July, 2005. Following approval by the Planning Commission, the San Jose City Council would hear the matter during August, 2005. (City of San Jose 2005).

CONSISTENCY WITH OTHER LAND USE CRITERIA FROM CEQA GUIDELINES

Construction and operation of the LECEF Phase 2 combined-cycle power plant and its associated linear facilities would not significantly interfere with, disrupt, or physically divide any established communities around the project site. It would be consistent with existing land uses, particularly the existing LECEF simple-cycle facility since it would be built within the boundaries of the current LECEF site, and it would not result in the conversion of any farmland. The two new 230-kV transmission lines would extend a short distance to the north and connect with the recently constructed Silicon Valley Power Station. Staff is not proposing any additional mitigation measures

CUMULATIVE IMPACTS

Cumulative impacts may be caused if a proposed project would have effects that are individually limited but cumulatively considerable when viewed together with the effects of related projects. **Land Use Table 2** displays the reasonably foreseeable development projects whose status has changed since the original land use analysis was conducted in 2001. .As indicated earlier in this analysis, the U.S. Dataport project, an internet information service campus, has put their project on hold indefinitely.

The LECEF Phase 2 project would not result in any significant cumulative land use impacts. The proposed project does not significantly contribute to regional impacts related to new development and growth, such as population in-migration, increased demand for public services, expansion of public infrastructure, or loss of open space. The proposed project's contribution to land use impacts resulting from past, present, and probable future projects described in **Land Use Table 2** is not expected to be cumulatively considerable. The proposed project is consistent with the long-term plans of the City (Horwedel, 2001a; Horwedel, 2001b), and would not contribute to a cumulatively significant impact to the City's goals and plans for the area. Therefore,

Staff concludes that there are no significant cumulative land use impacts associated with the proposed project.

Land Use Table 2
Reasonably Foreseeable Development Projects

Development	Size	Location	Jurisdiction	Status
Pacific Gas and Electric Los Esteros Substation	7.3-mile transmission line 24-acre substation and upgrades	Located directly north of LECEF	California Public Utilities Commission	In operation.
Metcalf Energy Center Power Plant	600 megawatt power	Approximately eight miles from LECEF, in the Coyote Valley Industrial Park	California Energy Commission	Construction is 98 percent complete.
Silicon Valley Power Switching Station	230 kV upgrade	Between LECEF and the PG&E Los Esteros Substation	California Public Utilities Commission	In operation.
Spartan Energy Center	96 megawatt power plant	Approximately 11 miles from LECEF, at 1980 South 7th Street, San Jose	California Energy Commission	Application was withdrawn.
Palm Corporation Industrial Campus	1.2 million sq. ft. office space	One mile west of LECEF, south of SR 237, east of First Street	City of San Jose	Project has been approved but is currently on hold
Cisco Systems Industrial Campus	2 million sq. ft. office space	One mile west of LECEF, north of SR 237, on both sides of First Street	City of San Jose	Two of ten buildings have been built, but the project is currently on hold.
Irvine Company Apartment Complex	~~2~~ 3,400-units apartments	One mile south of LECEF	City of San Jose	3400 approved apartments; 1344 built with 94% occupancy
Veritas Software Industrial Campus	990,000 sq. ft. office space	Less than one mile from LECEF, north of State Route 237, southwest of McCarthy Boulevard	City of Milpitas	Construction of 3 of the planned 6 buildings is near completion. As of November 2001, Veritas has told the City of Milpitas that only 1 building will be occupied in the immediate future.
Irvine Company Business Park	1 million sq. ft. business park	Less than one mile from the project site, north of State Route 237 and northeast of McCarthy Boulevard	City of Milpitas	Construction is in the advanced stages, but a completion date is not available.
Peery and Arrillaga Company Office Park Development	400,000 sq. ft. of office space, with potential for some residential use.	Less than two miles from LECEF, in Tasman area, south of SR 237 and west of I 880.	City of Milpitas	Construction is about completed, but there is no timeline on when the buildings will become occupied.
High and Medium Residential Development	High and medium residential developments, with a mixture of office uses	Southeast of SR 237, east of I 880	City of Milpitas	The City of Milpitas is studying the conversion of some zoning designations in this area to allow for mixed development. Potential adoption of the plan is scheduled for March 2002. At the maximum extent, up to 4,800 new residential units could be created in the next 20 years, although currently no accurate estimates are available.
PICO Power Project	122 MW-baseload, 147 MW-Peaking	South of Bayshore Freeway; Less than 5miles South	City of Santa Clara	Project is 88 percent complete
Source: AFC, City of San Jose Planning Department (Crabtree, 2001b; Eastman, 2001a,b), City of San Jose Department of Transportation (Tripousis, 2001), and the City of Milpitas Planning Department (Burkey, 2001), City of San Jose Planning Department (City of San Jose, 2004b, and c).				

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS

As noted above, the City of San Jose staff is currently reviewing the applicant's rezoning request. . The proposed LECEF Phase 2 project would not physically divide an established community, and would not conflict with any applicable habitat conservation plan. In addition, the proposed project would not conflict with any existing or planned

land uses, recreational or agricultural land uses. Therefore, there are no significant land use impacts. The approval of the applicant's rezoning request by the City of San Jose, prior to the Commission's Final Decision, will allow staff to fully recommend the approval of the LECEF Phase 2 project.

PROPOSED CONDITION OF CERTIFICATION

None

REFERENCES

CEC (California Energy Commission). Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. July 2, 2002.

City of San Jose 2001a. Letter from Joseph Horwedel, Acting Director of the City of San Jose Planning, Building, and Code Enforcement, to the California Energy Commission on September 13, 2001 regarding the City's approval of the applicant PD rezoning schedule as described in a supplement to the Phase 1 AFC.

City of San Jose 2001b. Letter from Joseph Horwedel, Acting Director of the City of San Jose Planning, Building, and Code Enforcement, to the California Energy Commission on October 17,2001 regarding the City's updated schedule.

City of San Jose 2004a. Personal Communication with Mike Mena, City of San Jose Planning staff, and James Adams, California Energy Commission, on July 7, 2004.

City of San Jose 2004b. Personal Communication via telephone and facsimile with Mike Mena, City of San Jose Planning staff, and James Adams, California Energy Commission, on July 8, 2004.

City of San Jose 2004c. Personal Communication via telephone and facsimile with Mike Mena, City of San Jose Planning staff, and James Adams, California Energy Commission, on August 26, 2004.

City of San Jose, 2005a. Personal Communication via telephone with Rich Buikema, City of San Jose Planning staff, and Bob Eller, California Energy Commission, on May 23, 2005.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2001. Application for Certification, Volume 1 & Appendices, Los Esteros Central Energy Facility. Dated April 2001.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

NOISE AND VIBRATION

Testimony of Steve Baker

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the time of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the Los Esteros Phase 2 Combined Cycle Conversion (LECEF 2), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS). For an explanation of technical terms employed in this testimony, please refer to **NOISE Appendix A** immediately following this testimony.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed (see **NOISE Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects. These guidelines have been applied by other jurisdictions to other types of projects such as power plants. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. The Model also contains a definition of a simple tone, or "pure tone," in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five dBA.

The California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (see **NOISE Appendix A, Table A4**).

LOCAL

County of Santa Clara

Because the project site lies within the City of San Jose, noise regulations of the County of Santa Clara do not apply to this project.

City of San Jose Noise Ordinance

Sections 10.16.010 and 10.16.020 of the City of San Jose Municipal Code are part of a Noise Ordinance that protects the community from disturbing or unreasonably loud noises.

City of San Jose Zoning Ordinance

Title 20 of the San Jose Municipal Code is a Zoning Ordinance that includes performance standards for noise transmitted between properties. These standards specify the amount of noise that is allowed at the property line of a noise source adjacent to sensitive uses. LECEF is located on land designated as Agricultural-Planned Development. The maximum noise levels allowed by Section 20.20.300 of the Zoning Ordinance for uses in agricultural districts are (measured at the adjacent property line):

- 55 dB adjacent to a property used or zoned for residential purposes;
- 60 dB adjacent to a property used or zoned for commercial purposes; and
- 70 dB adjacent to a property used or zoned for industrial use.

This section further prohibits activity that causes ground vibration that is perceptible, without instruments, at the property line of the site.

City of San Jose General Plan Noise Element

The Hazards/Noise Element of the 2020 General Plan (adopted August 16, 1994) designates the following noise levels as satisfactory:

- public, quasi-public, residential, recreation and commercial land uses: 60 dBA L_{dn}
- industrial land uses: 70 dBA L_{dn}
- agricultural and open land: 76 dBA L_{dn}

Noise Policy 1 of the Noise Element pursues the long-range exterior noise goal of 55 dBA L_{dn} by requiring that non-residential uses located adjacent to existing or planned residences or public/quasi-public uses (schools, libraries and hospitals) should mitigate as necessary to achieve a noise limit of 55 dBA L_{dn} at the property line. (Because existing noise levels exceed this figure in many locations, Policy 1 sets 60 dBA L_{dn} as a short-range goal.) Further, the maximum acceptable exterior noise level is 76 dBA L_{dn}, a level beyond which the federal Environmental Protection Agency considers noise to be hazardous to health.

Noise Policy 9 states that construction operations should use available noise suppression techniques.

Noise Policy 11 restates the limit of 55 dBA L_{dn} for property line noise from a non-residential use adjacent to residential and public/quasi-public uses.

Riparian Corridor Policy

The City of San Jose's Riparian Corridor Policy (updated in 1999) provides guidelines that would limit noise impacts on riparian areas, including Coyote Creek. This policy recommends that noise levels be limited to 60 dBA L_{dn} at property lines, or background noise levels not be exceeded.

SETTING

PROJECT BACKGROUND

The LECEF is a currently operating 180 MW peaking power plant consisting of four simple cycle gas turbine generators and auxiliary equipment. This project consists of converting this existing power plant into a four-on-one[1] combined cycle plant by adding the following major equipment (LECEF, LLC 2003, AFC §§ 1.1, 2.1, 2.4):

- a 140 MW steam turbine generator;
- a surface condenser to condense steam exhausted from the turbine;

[1] Four gas turbines generate electricity and exhaust into heat recovery steam generators; the steam from these is directed to a single steam turbine generator, which generates additional electricity.

- a six-cell plume-abated evaporative cooling tower to cool the condenser;
- boiler feedwater pumps and circulating water pumps;
- heat recovery steam generator (HRSG) tube bundles, steam drums and piping (to be installed in the existing HRSG shells);
- HRSG duct burners to increase generating capacity; and
- a second ammonia storage tank.

The LECEF lies on a 21-acre site within a 34-acre parcel, on land previously annexed by the City of San Jose. To the south lies Highway 237; to the west are Zanker Road and buffer lands connected with the San Jose/Santa Clara Water Pollution Control Plant (WPCP); to the north are the existing PG&E Los Esteros substation, agricultural and buffer lands, and the proposed San Francisco Bay Trail; and to the east lie agricultural lands and the Coyote Creek riparian corridor. The land is zoned PD (Planned Development), appropriate for this use (LECEF, LLC 2003, AFC § 8.6.1.3).

Construction is expected to last 19 months (LECEF, LLC 2003, AFC §§ 1.2, 2.4.9).

EXISTING LAND USE

The nearest sensitive noise receptors are residences on the Cilker property, approximately 1,100 feet (0.2 miles) southeast of the site. An existing bicycle-hiking trail and a mobile home park lie to the southwest and east across Highway 237, approximately 0.6 to 0.8 miles distant. See **NOISE AND VIBRATION – FIGURE 1**.

No new linear facilities will be required for this phase of the project.

ANALYSIS

The project must not only comply with the noise LORS described above, but must also be examined for adverse impacts under the California Environmental Quality Act (CEQA).

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

a) exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

d) a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The Energy Commission staff, in applying item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by five dBA L_{90} or more at the nearest sensitive receptor.

Staff considers it reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is clearly significant. An increase between 5 and 10 dBA should be considered adverse, but may be either significant or insignificant, depending on the particular circumstances of a case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. the resulting noise level[2];
2. the duration and frequency of the noise;
3. the number of people affected;
4. the land use designation of the affected receptor sites; and
5. public concern or controversy as demonstrated at workshops or hearings, or by correspondence.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. the construction activity is temporary;
2. use of heavy equipment and noisy activities is limited to daytime hours; and
3. all industry-standard noise abatement measures are implemented for noise-producing equipment.

EXISTING NOISE LEVELS

In order to predict the likely effects on adjacent sensitive receptors, the applicant is typically required to perform measurements of the ambient noise regime in the project vicinity, recording noise levels over a period of 25 hours at a minimum. Then, the expected noise emissions from the project are computer modeled, using available software and noise emission values provided by equipment suppliers. The modeled

[2] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments, and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA at nearby sensitive receptors, and the resulting noise level would be 40 dBA or less, the project noise level would likely be insignificant.

project noise is compared to the measured ambient noise to identify any likely impacts, so that additional noise mitigation can be designed into the project as required.

In the case of LECEF 2 Phase 2, this process had been partially satisfied. Condition of Certification NOISE-4 of the Energy Commission's Decision on the LECEF project (01-AFC-12) required the project owner to measure the noise regime in the project vicinity, both before commencement of construction and with the completed simple cycle project operating:

> "A. Prior to initiating construction, the project owner shall conduct a 25-hour community noise survey at the main Cilker home to determine the ambient noise levels, if appropriate….
>
> "B. 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 Coyote Creek riparian corridor and the location of the proposed San Francisco Bay Trail. 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. In addition, the project owner shall conduct a 25-hour community noise survey at the main Cilker home, if appropriate. The survey during power plant operations 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…." (CEC 2002b, pp. 301-2)

To satisfy part A. of this condition, the project owner measured ambient noise at the backyard fence of the main Cilker residence on January 31 and February 1, 2002 (LECEF, LLC 2003, § 8.7.2.4, App. 8.7-B). The background noise level, or L_{90} value, reached a minimum of 46 dBA for the four-hour period from midnight to 4:00 a.m.

To satisfy part B. of Condition NOISE-4, the project owner measured noise at the Cilker residence, at the proposed San Francisco Bay Trail site, and at the Coyote Creek riparian corridor on April 2 through April 4, 2003 (LECEF, LLC 2003, § 8.7.2.4, App. 8.7-B). With the power plant operating, noise at the Cilker residence was in the same range as without the plant. Background noise levels at the residence were 45 to 47 dBA L_{90} with the plant operating (midnight to 4:00 a.m. on April 3), and 45 to 47 dBA L_{90} with the plant shut down (midnight to 4:00 a.m. on April 4) (LECEF, LLC 2003, App. 8.7-B, Table 2). This indicates that LECEF contributes little, if any, noise at the nearest sensitive receptor, and gives the baseline measurement from which LECEF 2 Phase 2 noise impacts can be predicted and measured.

Existing ambient nighttime noise levels in the vicinity of the project site, then, are summarized in **NOISE Table 1**. Locations are as depicted in **NOISE AND VIBRATION - Figure 1**. Nighttime figures are useful for predicting noise impacts of the operating power plant.

NOISE Table 1: Ambient Nighttime Noise Levels

Monitoring Location	L_{eq} (dBA)	**L_{90} (dBA)**
Cilker Residence	52*	**46***
Coyote Creek Riparian Corridor (M2)	50	**48**
Proposed S.F. Bay Trail	**50***	**47***

*Average of four quietest nighttime hours (midnight-4 a.m.)
Source: LECEF, LLC 2003, AFC Table 8.7-6; Appendix 8.7-B, Tables 1,2,3, and Figure 6

In order to predict construction noise impacts on sensitive receptors, staff compares predicted noise levels to the daytime ambient noise regime at sensitive receptors. Accordingly, **NOISE Table 2** summarizes the daytime noise levels in the vicinity of the Cilker residence, the most sensitive receptor (and the only one for which daytime figures are available):

NOISE Table 2: Ambient Daytime Noise Levels

Monitoring Location	L_{eq} (dBA)	**L_{90} (dBA)**
Cilker Residence	**58**	**53**

Average of four quietest day time hours (noon-4 p.m.) on April 3, 2003
Source: LECEF, LLC 2003, AFC Appendix 8.7-B, Table 2

IMPACTS AND COMPLIANCE WITH LORS

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the plant.

PROJECT CONSTRUCTION

Community Effects

General Construction Noise

Construction noise is usually considered a temporary phenomenon. Construction of LECEF Phase 2 is expected to last approximately 19 months (LECEF, LLC 2003, AFC §§ 1.2, 2.4.9). Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances. While there are no LORS that specifically limit the duration of construction noise, the Noise Element of the City of San Jose General Plan includes Noise Policy 9, which encourages construction operations to use available noise suppression devices and techniques (City of San Jose 1994). In addition, section 20.20.300 of the San Jose Municipal Code includes Table 20-45, which establishes a maximum noise level for the sound delivered to any adjacent property line. If the noise at the property line of an adjacent residential property (such as the Cilker residence) exceeds a maximum of 55 dBA, then a conditional use permit must be obtained for the work. Further, no vibration is permitted that is perceptible, without instruments, at the property line (City of San Jose 2004).

The applicant has predicted likely construction noise impacts on nearby receptors (LECEF, LLC 2003, AFC § 8.7.4.1, p. 8.7-8). Likely construction noise levels at the Cilker residence are expected to range from 46 to 57 dBA. Comparing this to the daytime ambient L_{eq} level of 58 dBA (see **NOISE Table 2** above) allows the conclusion that construction noise will be barely noticeable, and certainly not intrusive, at this location. While the applicable LORS, the San Jose Municipal Code section 20.20.300, limits noise to 55 dBA, the sporadic and temporary nature of construction noise allows staff to conclude that the work will likely be in compliance with this LORS. To avoid surprising nearby residents with construction noise, and to provide a means for dealing with noise complaints, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2** below. These conditions would require notification of nearby residents that construction is about to begin, and would create a noise complaint monitoring and resolution process.

Pile Driving Noise

The applicant plans to employ pile driving in the construction of Phase 2 of the project. Noise levels from this operation are expected to reach 77 dBA at the Cilker property (LECEF, LLC 2003, AFC § 8.7.4.1, p. 8.7-9). While staff agrees with the applicant that this should be tolerable to residents, it would violate the 55 dBA limit specified in section 20.20.300 of the San Jose Municipal Code. Therefore, in order to minimize the potential for adverse impacts on residential receptors, staff recommends that pile driving be restricted to the same daytime hours that were required in the original LECEF Decision (CEC 2002b). These requirements are embodied in proposed Condition of Certification **NOISE-8** below.

Steam Blows

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feed water and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam is then raised in each heat recovery steam generator or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam lines are connected to the steam turbine, which is then ready for operation.

In the case of LECEF, these high-pressure steam blows, if unsilenced, could produce noise as loud as 129 dBA at a distance of 50 feet. With a silencer installed on the steam blow piping, noise levels would still reach 89 dBA at 50 feet. This would attenuate to approximately 59 dBA at the Cilker residence, nearly 1,500 feet distant (LECEF, LLC 2004a, p. S-27). Compared to the daytime ambient noise level at the residence of 58

dBA L_{eq}, steam blow noise should be barely noticeable, and certainly unobtrusive. To ensure that this noise does not present a problem, staff recommends that steam blows be performed only during daytime hours, and only with proper silencers in place. Additionally, staff recommends that nearby residents be notified in advance of steam blows, in order to eliminate possible surprise. To ensure that this occurs, staff proposes Conditions of Certification **NOISE-4** and **NOISE-5** below.

Vibration

The only construction operation likely to produce significant vibration is pile driving. The applicant believes, and staff concurs, that the groundborne vibration from pile driving will attenuate to imperceptible levels at the nearest sensitive receptors (LECEF, LLC 2003, AFC § 8.7.4.1, p. 8.7-10).

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (LECEF, LLC 2003, AFC §§ 8.7.7.2, 8.7.7.3). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

PROJECT OPERATION

Community Effects

Power plant noise is unique. A power plant operates as essentially a steady, continuous noise source, unlike the intermittent sounds that comprise the majority of the noise environment. As such, power plant noise contributes to, and becomes part of, the background noise level, or the sound heard when most intermittent noises cease. Where power plant noise is audible, it will tend to define the background noise level. For this reason, staff compares the projected power plant noise to the existing ambient background (L_{90}) noise levels at the affected sensitive receptors. If this comparison identifies a significant adverse impact, then feasible mitigation must be incorporated in the project to eliminate or reduce the impact.

In most cases, a power plant will be intended to operate around the clock for much of the year. Staff believes it prudent to average the lowest nighttime hourly background noise level values to arrive at a reasonable baseline for comparison with the project's projected noise level. This assumes the potential for annoyance due to power plant noise is greatest at night when residents are trying to sleep.

In addition, staff compares the projected project noise with applicable LORS, in this case, the City of San Jose General Plan Noise Element and Zoning Ordinance.

Power Plant Operation

During its operating life, the LECEF would represent essentially a steady, continuous noise source day and night. Occasional brief increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant

would be shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources added by the Phase 2 project would include the steam turbine generator, HRSG exhaust, mechanical draft cooling tower and various pumps. The noise emanating from a power plant during normal operation is generally broadband, steady state in nature.

The applicant performed noise monitoring to quantify the ambient noise regime at sensitive receptors near the project site (LECEF, LLC 2003, § 8.7.2.4, App. 8.7-B). Staff typically examines the L_{90} values averaged over the four quietest consecutive hours of the night; we believe this gives the most meaningful indication of noise levels when people are trying to sleep.

The applicant performed acoustical modeling to determine the project's noise impacts on sensitive receptors (LECEF, LLC 2003, AFC § 8.7.4.2; Tables 8.7-10, 8.7-11). Note that this modeling included a noise barrier wall around the fuel gas compressors (LECEF, LLC 2003, AFC § 8.7.4.2, p. 8.7-11;§ 8.7.6). These projections are shown in **NOISE Table 3**:

NOISE Table 3 – Projected Plant Operational Noise Impacts (dBA)

Monitoring Location	Ambient Four-Hour Average Background	Projected Power Plant Noise Level	Resultant Level
Cilker Residence	46 L_{90}[1]	55 L_{eq}	55 L_{eq}[2]
Coyote Creek Riparian Corridor (M2)	48 L_{90}[1]	60 L_{dn}[3]	60 L_{dn}

[1]Source: LECEF, LLC 2003, AFC Table 8.7-6; Appendix 8.7-B, Tables 1,2,3, and Figure 6
[2]Source: LECEF, LLC 2003, AFC Table 8.7-10
[3]Source: LECEF, LLC 2003, AFC Table 8.7-11

Compliance with City of San Jose Noise Element

The City General Plan Noise Element sets a short-range guideline of 60 dBA L_{dn} for noise sources such as the LECEF. If the project noise at the Cilker property line is held to 55 dBA L_{eq} as projected in the AFC, for a steady noise source such as a power plant, this would be equivalent to 61 dBA L_{dn}. Since the project noise impact modeling is performed using conservative assumptions, actual project noise will likely be less than projected. Staff thus believes the project will comply with this LORS. To ensure this compliance, staff proposes Condition of Certification **NOISE-6** below.

Compliance with City of San Jose Zoning Ordinance

Section 20.20.300 of the City Zoning Ordinance sets a maximum noise level, at an adjacent residential property line, of 55 dBA L_{eq}. The applicant's projected noise impact at the Cilker residence satisfies this limit.

Compliance with Riparian Corridor Policy

The City's Riparian Corridor Policy sets a limit of 60 dBA L_{dn}, measured at the Coyote Creek Riparian Corridor. The applicant predicts that the project will not exceed this limit (LECEF, LLC 2003, AFC Table 8.7-11). To ensure compliance with this LORS, staff proposed Condition of Certification **NOISE-6** below.

Significant Impacts under CEQA

As described above (see the CEQA subsection under the heading "Analysis"), staff typically considers an increase above background noise levels greater than 10 dBA to constitute a significant adverse impact. Where the ambient noise regime is relatively noisy, as is the case around the LECEF project site, increases up to 10 dBA are generally considered acceptable. (If the ambient noise regime were very quiet, such an increase would be deemed annoying; conversely, if the ambient noise regime were exceedingly noisy, increases much less than 10 dBA would likely be deemed significant.) As shown in **NOISE Table 3** above, the project would cause an increase in the four-hour average background noise level at the Cilker residence, the nearest sensitive receptor, of approximately 9 dBA. Given the noisy nature of the noise regime in this area, staff believes such an increase would not constitute a significant adverse impact. To ensure that project noise does not exceed this level, staff proposes Condition of Certification **NOISE-6** below. In the event that project noise should cause problems, staff proposes Condition of Certification **NOISE-2** below, which would provide for a noise complaint monitoring and resolution process.

Tonal and Intermittent Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. Intermittent noises would include steam relief valves venting during startup, shutdown or unplanned unit trips. The noise monitoring performed after the commencement of operation of the first phase of LECEF (LECEF, LLC 2003, AFC App. 8.7-B, Figure 5) showed that the applicant had succeeded in preventing tonals. Staff fully expects that no tonals will result from the addition of Phase 2. To ensure this is the case, staff proposes Condition of Certification **NOISE-6** below.

Vibration

Vibration from an operating power plant could be transmitted by two chief means; through the ground (groundborne vibration), and through the air (airborne vibration).

The operating components of a combined cycle power plant consist of high-speed gas and steam turbines and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permissible vibration levels are quite low. The applicant claims that no vibration will be felt offsite (LECEF, LLC 2003, AFC § 8.7.4.1, pp. 8.7-9 to 8.7-10). Energy Commission staff agrees with this estimate, and agrees with the applicant that groundborne vibration from LECEF will be undetectable by any likely receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. LECEF's chief source of airborne vibration would be the gas turbines' exhaust. In a combined cycle plant such as LECEF, however, the exhaust must pass through the HRSGs before it reaches the atmosphere. The HRSGs act as extremely efficient mufflers; it would be exceedingly rare for such a plant to cause perceptible airborne vibration effects.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (LECEF, LLC 2003, AFC §§ 8.7.7.2, 8.7.7.3). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7** below.

CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

Neither the applicant nor Energy Commission staff is aware of any other similar projects in the immediate area. Noise impacts from two projects can only accumulate if the projects are relatively near each other, i.e., within less than half a mile. The land surrounding the LECEF site is largely undevelopable. Buffer lands around the WPCP sludge ponds and the small size of the existing undeveloped parcels near the site would discourage development of any use that produces significant noise. The only likely development would be the US DataPort project. Both US DataPort and LECEF have been designed with such cumulative noise emissions in mind (LECEF, LLC 2003, AFC § 8.7.5). Staff believes no cumulative noise impacts are likely.

FACILITY CLOSURE

In the future, upon closure of LECEF, all operational noise from the project would cease, and no further adverse noise impacts from operation of LECEF would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of LECEF, it can be treated similarly. That is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that were

in existence at that time would apply. Applicable conditions of certification included in the Energy Commission Decision would also apply unless modified.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that if LECEF is built as described above, it would produce no significant adverse noise impacts during plant construction or operation, and would comply with all applicable noise LORS. The project would create no cumulative impacts with another project. To ensure compliance, staff recommends adoption of the following Conditions of Certification.

RESPONSE TO COMMENTS FROM THE PUBLIC

Staff has received no comments from the public.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one-half mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. 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: Prior to ground disturbance, the project owner shall transmit to the CPM a statement, signed by the project manager, stating that the above notification has been performed, and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

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 (below), 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 ~~five~~ten days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the local jurisdiction and the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE-3 The project owner shall submit to the CPM for review and approval 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 ground disturbance, the project owner shall submit to the CPM the noise control program. The project owner shall make the program available to Cal-OSHA upon request.

STEAM BLOW MANAGEMENT

NOISE-4 The project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at a distance of 50 feet. The project owner shall conduct steam blows only during the hours specified in Condition of Certification **NOISE-8**, unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance.

Verification: At least 15 days prior to the first steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule.

STEAM BLOW NOTIFICATION

NOISE-5 Prior to the first steam blow(s), the project owner shall notify all residents and business owners within one-half mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner.

The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Project owner shall notify residents and businesses at least 15 days prior to the first steam blow(s). Within five days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE RESTRICTIONS

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due to plant operation to exceed the values shown here:

Monitoring Location	Noise Due to Project
Cilker Residence	55 dBA L_{eq}
Coyote Creek Riparian Corridor (M2)	60 dBA L_{dn}

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 and transient vents shall be adequately muffled to preclude noise that draws legitimate complaints.

A. When the project first achieves a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at the Cilker residence. This 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.

During the period of this survey, the project owner shall conduct a short-term survey of noise at the Coyote Creek Riparian Corridor. 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 measurement of power plant noise for the purposes of demonstrating compliance with this Condition of Certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the nearest residence. However, notwithstanding the use of this alternative method for determining the noise level, the character of the plant noise shall be evaluated at the nearest residence to determine the presence of pure tones or other dominant sources of plant noise.

B. If the results from the noise survey indicate that the power plant noise level (L_{eq}) at the affected receptor exceeds the above value for any given hour during the 25-hour period, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

C. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity. Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the 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. When these measures are in place, the project owner shall repeat the noise survey.

Within 30 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 Following the project first achieving a sustained output of 80 percent or greater of rated capacity, 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.

CONSTRUCTION TIME RESTRICTIONS

NOISE-8 Pile driving and steam blows shall be restricted to the times of day delineated below:

Any day	8 a.m. to 5 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Los Esteros Critical Energy Facility Combined Cycle Conversion
(03-AFC-2)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____

Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: $ _____
Date installation completed: _____
Date first letter sent to complainant: _____ (copy attached)
Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

REFERENCES

CEC (California Energy Commission). 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission). 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission). 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. July 2, 2002.

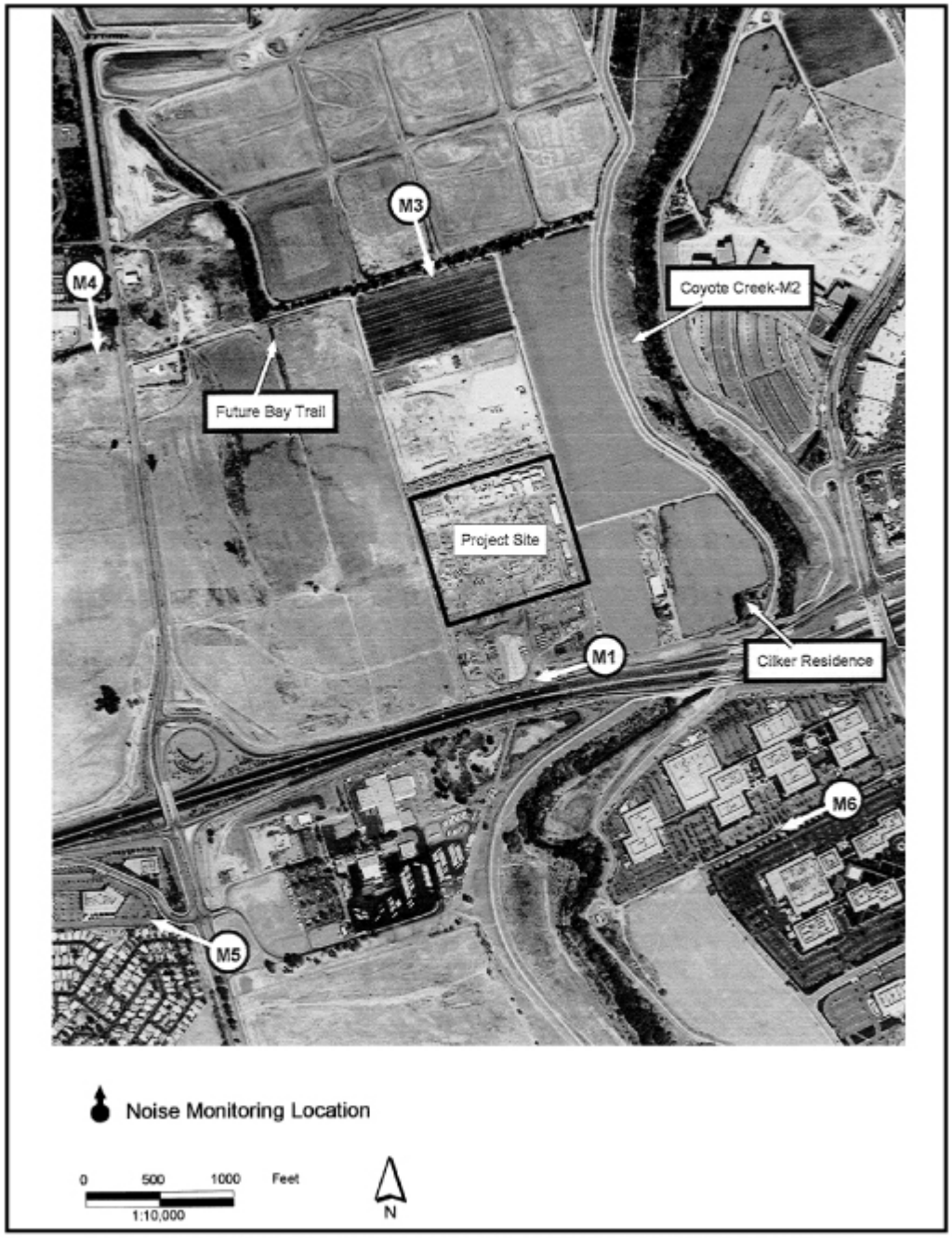
City of San Jose. 1994. San Jose 2020 General Plan. Adopted August 16, 1994.

City of San Jose. 2004. San Jose Municipal Code.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

NOISE AND VIBRATION - FIGURE 1
Los Esteros Phase 2 - Facility Noise Monitoring Locations



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JULY 2004
SOURCE: 03-AFC-2 Figure 8.7-1

JULY 2004 NOISE AND VIBRATION

NOISE APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **Noise Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (L_{dn}). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical L_{dn} values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31,1971).

In order to help the reader understand the concept of noise in decibels (dBA), **Noise Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

Noise Table A1 Definition of Some Technical Terms Related to Noise	
Terms	**Definitions**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level, L_{eq}	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn} or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.

Noise Table A2 Typical Environmental and Industry Sound Levels			
Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

Subjective Response to Noise

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new

noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.
With regard to increases in A-weighted noise levels, knowledge of the following relationships can be helpful in understanding the significance of human exposure to noise.

1 Except under special conditions, a change in sound level of one dB cannot be perceived.

2 Outside of the laboratory, a three dB change is considered a barely noticeable difference.

3 A change in level of at least five dB is required before any noticeable change in community response would be expected.

4 A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970)

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

Noise Table A3
Addition of Decibel Values

When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0

Figures in this table are accurate to ± 1 dB.

Source: Architectural Acoustics, M. David Egan, 1988

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source 10 times reduces the sound pressure level by 20 dB.

Worker Protection

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

Noise Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: 29 C.F.R. § 1910.95

PUBLIC HEALTH

Testimony of Ramesh Sundareswaran

INTRODUCTION

The purpose of staff's public health analysis is to determine if toxic emissions from the proposed Phase 2 combined cycle conversion of the existing Los Esteros Critical Energy Facility (LECEF) will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. The existing LECEF will be converted to a 320MW facility (Phase 2) through the addition of heat recovery steam generators, cooling towers and ancillary equipment. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section. Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** section. Health effects from electronic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams are discussed in the **Soils and Water Resources** section. Historical spills at the site such as those from disposal practices, leaks, accidents or deliberate incidents are described in the **Waste Management** section.

METHOD OF ANALYSIS

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

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

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

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

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

1. using the highest levels of pollutants that could be emitted from the plant;
2. assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
3. using the type of air quality computer model which predicts the greatest plausible impacts;
4. calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
5. using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
6. assuming that an residential individual's exposure to cancer-causing agents occurs for 70 years and that a worker's exposure occurs for 46 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances which could present a health hazard from noninhalation pathways of exposure (see CAPCOA 1993, Table III-5, now superceded by Office of Environmental Health Hazard Assessment Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2003), p 5-2). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19, now superceded by OEHHA 2003, p. 5-3).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term). Acute health effects result from short-term (1-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those which arise as a result of long term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from 12 to one hundred percent of a lifetime or from eight to seventy years (OEHHA 2003, p. 6-5). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called "reference exposure levels" or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36, now superceded by OEHHA 2003, p. 6-2).

These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with California Air Pollution Control Officers Association (CAPCOA) guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (CAPCOA 1993, p. III-37, now superceded by OEHHA 2003, pp. 1-5, 8-12). In those cases where the actions may be synergistic or antagonistic (where the effects are greater than or less than the sum, respectively), this approach may underestimate the health impact (Id).

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

Cancer risk is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called “potency factors”, and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower or even considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate assessment of potential public health risks.

SIGNIFICANCE CRITERIA

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

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

Acute and Chronic Noncancer Health Effects

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

Cancer Risk

Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a cancer risk significance level. Title 22, California Code of Regulations, § 12703(b) states that “the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure.” This level of risk is equivalent to a cancer risk of ten-in-one million, or 10×10^{-6}. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65.

The significant risk level of ten-in-one million is consistent with the level of significance adopted by the Bay Area Air Quality Management District (BAAQMD) Board of Directors pursuant to Health and Safety Code § 44362(b), which requires notification of nearby residents when an air district determines that there is a significant health risk from a facility.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk

estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten-in-one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten-in-one million, staff would deem such risk to be significant, and would not recommend project approval.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following state and local laws, ordinances, regulations, and standards(LORS) generally apply to the protection of public health. These provisions have established the basis for Energy Commission staff's determination regarding the significance and acceptability of project-related impacts on public health. There are no federal LORS that apply directly to the public health analysis of this project.

STATE

California Health and Safety Code sections 39650 et seq.

These sections mandate the Air Resources Board and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

California Health and Safety Code section 41700

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

LOCAL

Bay Area Air Quality Management District Rule 2-1-316

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

SETTING

Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density which, in turn, affects

public exposure to project emissions. Additional factors affecting potential public health impact include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed project is located on approximately 34 acres in north San Jose at 800 Thomas Foon Chew Way. The site lies on the north side of State Route 237, approximately 0.25 mile west of Coyote Creek. The site topography is relatively flat, with an elevation about 15 feet above sea level. The site is located within the northern end of the Santa Clara Valley, at the south end of the San Francisco Bay (which lies approximately seven miles west-northwest of the site). The Valley is bordered by the Santa Cruz Mountains to the west and by the Coastal Range to the east (LECEF LLC 2003).

Currently, land at the proposed site is located within an area designated for industry. Existing land uses in the project vicinity include a wastewater treatment plant and its buffer area, State Route 237, a bus yard, a mobile home park, wildlife refuge and agricultural and industrial uses.

Future growth in Santa Clara County is expected to occur in San Jose and in the south county; the north and west valley cities are expected to experience little population growth. Future development of the proposed U.S. DataPort project adjacent to the LECEF Phase 2 project will result in a new industrial park development in close proximity to Coyote Creek.

As mentioned above, the location of sensitive receptors near the proposed site is an important factor in considering potential public health impacts. The nearest residential areas are approximately 3,200 feet (0.6 mile) southwest, 4,200 feet (0.8 mile) east and 7,500 feet (1.4 miles) southeast of the proposed project site. The nearest schools are located about 5,300 feet (1 mile) and 6,900 feet (1.3 miles) northeast of the proposed site (in the city of Milpitas). AFC Figures 8.9-1a and 1b show sensitive receptors within a three-mile radius of the proposed project site (LECEF LLC 2003).

METEOROLOGY

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

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

annual rainfall occurs between November and March. During the winter, inversions are weak, winds often moderate, and the potential for air pollution is low.
Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents more detailed meteorological data.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of BAAQMD, which includes Santa Clara County as well as eight other Bay Area counties. BAAQMD conducts ambient monitoring of twelve gaseous toxic air contaminants at 23 locations throughout the district (BAAQMD 2003, 2004). By combining average toxic concentration levels from all monitoring sites with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air.

In 2002, the background cancer risk calculated by BAAQMD for the Bay area was 162-in-one million (BAAQMD 2004). The pollutants 1,3-butadiene and benzene, emitted primarily from mobile sources, were the two highest contributors to risk and together accounted for over half of the total. The risk from 1,3-butadiene was about 47-in-one million, while the risk from benzene was about 44-in-one million. Formaldehyde accounts for about ten percent of the 2002 average calculated cancer risk for the Bay Area, with a risk of about 16-in-one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the proposed LECEF Phase 2 project.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease of ambient levels of toxics and associated cancer risk during the past few years. For example, the Bay area average benzene level has continued to drop, and by the end of 2002, the level had dropped to 42 percent of the 1995 levels. Consequently, cancer risk, which was estimated to be 303-in-one million in1995 data, is estimated to be 162-in-one million in 2002.

The toxic air monitoring station closest to the LECEF Phase 2 project is on Fourth Street in San Jose. Daily sampling at this location was suspended in April, 2002 so that the resulting data is incomplete to quantify ambient risk in the vicinity of that station. However, 2001 data show that concentrations of benzene were lower at that station than the Bay Area average. In 2001, cancer risk for benzene was 28-in-one million at that station compared to 50.2 in the Bay Area (BAAQMD 2003).

SITE CONTAMINATION

As discussed in the **Waste Management** section, the site soils still contain residual contamination given the site's past agricultural use. Chemicals persistent at the site include pesticides and metals. The public could be exposed to these known contaminants and/or other unknown contamination during the proposed construction activities for Phase 2. A site-specific Soils Management Plan (SMP) prepared by a qualified registered professional will be implemented in order to mitigate risks from exposure to media, such as contaminated dust or soil, which may be encountered

during construction. The SMP would provide site-specific information for contractors and others that would improve their management of environmental and health and safety contingencies. Among the topics covered by the SMP include requirements for site-specific engineering controls and monitoring measures to minimize the production of contaminated dust and the transport of contaminated materials. Another is the preparation of a Health and Safety Plan (HSP) for site workers. The HSP is intended to protect workers from hazards including contaminated soils at the site through required site monitoring, reporting, and other controls. The requirements for workers also reduce the potential hazards during construction to the general public. A detailed discussion of the SMP is available in the **Waste Managemen**t section.

IMPACTS

PROJECT SPECIFIC IMPACTS

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

Construction Impacts

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

As described in the **Waste Management** section, soils at the proposed project site contain elevated levels of residual pesticides, including total DDT, dieldrin, endrin, lead and arsenic. Construction workers and the public could be exposed to known and unknown residual contamination during earth moving during construction. Control, monitoring and reporting measures as discussed earlier, however, will be in place to reduce the potential for generation of contaminated dust and also the transport of contaminated materials.

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

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

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants (SRP) recommended a chronic REL (see REL discussion in **METHOD OF ANALYSIS** section above) for diesel exhaust particulate matter of 5 $\mu g/m^3$ and a cancer unit risk factor of 300×10^{-6} $(\mu g/m^3)^{-1}$ (SRP 1998). The SRP did not recommend a value for an acute REL, since available data in support of a value was deemed insufficient. On August 27, 1998, the ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved the SRP recommendations regarding health effect levels.

Construction of LECEF Phase 2 is anticipated to take place over a period of approximately 19 months. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from eight to seventy years.

AFC Appendix 8.1-D2 presents exhaust emissions from construction activities. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Maximum daily emissions of 29.8 lb/day PM10 are determined, with 5.4 lb/day PM10 due to construction equipment, worker travel and related truck deliveries and about 24.3 lb/day due to fugitive dust emissions. About 10 percent (3 lb/day) of the total maximum daily PM10 emissions are due to onsite construction equipment emissions.

In order to mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, **Air Quality** staff recommends the use of ultra low sulfur diesel fuel and the installation of soot filters on stationary diesel equipment in its condition of certification **AQ-SC5**. The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both mitigation measures in the range of approximately 85-92 percent. Such filters will reduce diesel emissions during construction and reduce any potential for significant health impacts.

Operation

Emissions Sources

The new emissions sources at the proposed LECEF Phase 2 project include a six cell cooling tower, four heat recovery steam generators equipped with duct burners and a condensing heat turbine. During operation, potential public health risks are related to natural gas combustion emissions from the turbines and duct burners, and noncombustion emissions from the cooling tower.

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

Table 8.1-41 of the AFC lists noncriteria pollutants that may be emitted from LECEF Phase 2 turbines and steam generators as combustion byproducts, along with their anticipated amounts (emission factors). Emission factors are from AP-42 and from the California Air Toxics Emission Factors (CATEF) database. Table 8.9-4 of the AFC lists

toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include reference exposure levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the CAPCOA - now OEHHA Guidelines (OEHHA 2003). **PUBLIC HEALTH Table 1** lists combustion-related toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern, but if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

Noncriteria emissions from the cooling tower originate from contaminants in the cooling source water that become entrained in liquid water droplets emitted as cooling tower drift. LECEF Phase 2 will use treated wastewater from the San Jose/Santa Clara Water Pollution Control Plant (WPCP) for cooling. Constituents found in WPCP wastewater could be emitted as part of the drift and the amounts of each pollutant released to the atmosphere in the cooling tower drift will be based on the pollutant levels in the circulating cooling water. **PUBLIC HEALTH Table 2** lists these pollutants and shows how each contributes to the health risk analysis.

Emissions Levels

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

AFC Table 8.1-36 shows maximum hourly fuel use for the combustion gas turbines. The maximum fuel use is combined with the emission factor for each toxic air contaminant to estimate hourly and maximum annual emissions. Emission factors are estimates of the amounts of toxic substances released per unit of fuel burned and are from data compiled by the AP-42 and the California Air Toxic Emission Factors (CATEF) database maintained by the California Air Resources Board.

PUBLIC HEALTH Table 1
Types of Health Impacts and Exposure Routes Attributed to Combustion-Related Toxic Emissions

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

Source: AFC Table 8.9-4 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993 superceded by OEHHA 2003

PUBLIC HEALTH Table 2
Types of Health Impacts and Exposure Routes Attributed to Cooling Tower Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Chronic Noncancer	Acute Noncancer
Ammonia				3	3
Cadmium		3	3	3	
Chromium (III)				3	
Copper				3	
Lead		3	3	3	
Mercury		3			
Nickel			3	3	
Silver				3	3

Source: AFC Appendix Table 9.1-A2-7 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993 superceded by OEHHA 2003

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

The above method of assessing health effects is consistent with the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program (October 1993). This is now superceded by the OEHHA guidance manual referred to earlier, and results in the following health risk estimates (OEHHA 2003).

Impacts

The screening health risk assessment for the project, including combustion and noncombustion emissions, resulted in a maximum acute hazard index of 0.12 at a location northeast of the proposed site. There is no human habitation at this location (Figure 8.1-C2-1 in AFC). The chronic hazard index at the point of maximum impact for chronic noncancer health effects is 0.007 and is located southeast of the proposed facility and there are no residences at this location (Figure 8.1-C2-1 in AFC). As **PUBLIC HEALTH Table 3** shows, both acute and chronic hazard indices are under the REL of 1.0, indicating that no short- or long-term adverse health effects are expected.

Total worst-case individual cancer risk, as shown in **Public Health Table 3,** is estimated to be 0.093-in-one million. As discussed earlier, this is the risk at the location where long-term pollutant concentrations are calculated to be the highest, and is at the same location as the maximum chronic hazard.

At the time the AFC was being prepared, the Office of Environmental Health Hazard Assessment completed and adopted new guidelines and methods for preparing Health Risk Assessments for the Air Toxics Hot Spots program in October 2003. (OEHHA 2003). However, the software tool, Hotspots Analysis and Reporting Program (HARP) that assists with the programmatic requirements of the new Hot Spots program become available only later, in December of 2003. The new guidelines are a substantial refinement of the old guidelines and result in "better" and more representative estimates of risks from applicable facilities.

The cancer risk assessment portion of the health risk assessment in the AFC was revised using the new OEHHA guidelines (LECEF LLC 2004c) and was still found to be less than significant. The residential maximum cancer risk based on a lifetime exposure of 70 years is estimated to be 0.18 (high-end point estimate) or 0.09 (average point estimate) and at a location southeast of the facility. The maximum cancer risk for workers (who experience less exposure) is 0.04 . Thus, risks at all locations, including residential risks, are less than the significance level of 10 in a million.

PUBLIC HEALTH Table 3
Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Noncancer	0.12	1.0	No
Chronic Noncancer	0.007	1.0	No
Individual Cancer(old guidelines)	0.093×10^{-6}	10.0×10^{-6}	No
Individual Cancer (new guidelines)	a) Residential (high end estimate):0.18×10^{-6}	10.0×10^{-6}	No
	b) Residential (average estimate): 0.09×10^{-6}	10.0×10^{-6}	No
	c) Worker: 0.04×10^{-6}	10.0×10^{-6}	No

Source: AFC, Tables 8.9-9, 8.9-10, 8.9-12, LECEF 2004c

Cooling Tower

In addition to being a source of potential toxic air contaminants, the possibility exists for bacterial growth to occur in the cooling tower, including Legionella. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis.

Legionella can grow symbiotically with other bacteria and can infect protozoan hosts. This provides Legionella with protection from adverse environmental conditions, including making it more resistant to water treatment with chlorine, biocides, and other disinfectants. Thus, if not properly maintained, cooling water systems and their components can amplify and disseminate aerosols containing Legionella.

The U.S. Environmental Protection Agency (U.S. EPA) published an extensive review of Legionella in a human health criteria document (EPA 1999). The U.S. EPA noted that Legionella may propagate in biofilms (collections of microorganisms surrounded by slime they secrete, attached to either inert or living surfaces) and that aerosol-generating systems such as cooling towers can aid in the transmission of Legionella from water to air. The U.S. EPA has inadequate quantitative data on the infectivity of Legionella in humans to prepare a dose-response evaluation. Therefore, sufficient information is not available to support a quantitative characterization of the threshold infective dose of Legionella. Thus, the presence of even small numbers of Legionella bacteria presents a risk - however small - of disease in humans.

In 2000, the Cooling Technology Institute (CTI) issued its own report and guidelines for the best practices for control of Legionella (CTI 2000). The CTI found that 40-60 percent of industrial cooling towers tested were found to contain Legionella. It estimated that

more than 4,000 deaths per year are believed to occur from Legionellosis (from all sources, not limited to industrial cooling towers), but only about 1,000 are reported. The CTI listed no reference or supportive data for this assertion, however.

To minimize the risk from Legionella, the CTI noted that consensus recommendations included minimization of water stagnation, minimization of process leads into the cooling system that provide nutrients for bacteria, maintenance of overall system cleanliness, the application of scale and corrosion inhibitors as appropriate, the use of high-efficiency mist eliminators on cooling towers, and the overall general control of microbiological populations.

Good preventive maintenance is very important in the efficient operation of cooling towers and other evaporative equipment (ASHRAE 1998). Preventive maintenance includes having effective drift eliminators, periodically cleaning the system if appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations. Staff notes that most water treatment programs are designed to minimize scale, corrosion, and biofouling and not to control Legionella.

The efficacy of any biocide is in ensuring that bacterial growth, and in particular Legionella growth, is kept to a minimum. This is contingent upon a number of factors, including but not limited to proper dosage amounts, appropriate application procedures, and effective monitoring. Staff has proposed Condition of Certification **PH-1** that would require the project owner to prepare and implement a biocide and bacterial control program. The program, which would have to be approved by staff, would ensure that proper levels of biocide and other agents are maintained within the cooling tower water at all times, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup. Staff believes that with the use of an aggressive antibacterial program coupled with routine monitoring and bacteria removal, the chances of Legionella growth and dispersion would be reduced to insignificant.

CUMULATIVE IMPACTS

The maximum theoretical cancer risk for the Los Esteros Phase 2 facility ranges from 0.09 per million (average point estimate) to 0.18 per million (high-end point estimate). There is an existing diesel fire pump, permitted as part of the original Phase I project and which will be part of the Phase 2 project. The maximum cancer risk from the pump ranges from 1.68 per million (average point estimate) to 2.44 (high-end point estimate) and is localized to a small uninhabitated area immediately east of the facility's fenceline (Figure HRA-1b in revised cancer risk assessment). Since the risk is in excess of one in a million, the pump uses Best Available Control Technology to minimize Toxic Air Contaminant emissions (TBACT) as required by BAAQMD (BAAQMD 2002). TBACT for diesel fueled engines is a CARB or EPA certified engine with a PM10 certified level no greater than 0.1 grams/brakehorsepower-hour and should be successful in reducing health risks associated with the engine's emissions to acceptable levels.

The risks from the facility and the fire pump occur at separate locations. If the maximum risk for both sources occurred at the same location, the cumulative risk would range from 1.77 per million (average point estimate) to 2.62 (high-end point estimate) which is well below the significance threshold of 10 in one million. In comparison, BAAQMD estimated the Bay Area average lifetime cancer risk for inhalation of ambient air to be 162-in-one million based on 2002 ambient average toxic concentration data. Staff does not expect any project-related significant change in lifetime inhalation risk to any person, and the increase does not represent any real contribution to the ambient risk of 162 in one million. Actual risks are expected to be much lower, since worst-case estimates are based on conservative assumptions, and overstate the true magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the additional risk posed by the LECEF Phase 2 project to be either significant or cumulatively considerable given that the estimated risks are predicted to be below the significance threshold of 10 in one million.

The worst-case long-term noncancer health impact from LECEF (0.007 hazard index) is well below the significance level of 1.0. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term hazard would be lower at all other locations, and cumulative impacts at other locations would also be less than significant.

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

Even in the unlikely event that worst-case emissions from an existing facility were to coincide both geographically and temporally with LECEF Phase 2 emissions, the overall long-term health outlook would not change for anyone. Thus, the LECEF Phase 2 project will not result in any significant cumulative cancer or chronic noncancer health impacts.

COMPLIANCE WITH LORS

Staff concludes that construction and operation of the LECEF Phase 2 project will be in compliance with all applicable LORS regarding long-term and short-term project impacts.

FACILITY CLOSURE

The scope of staff's public health analysis is limited to routine releases of harmful substances to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or nonroutine releases from either hazardous materials or wastes which may be onsite. These are discussed in the sections on **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the

environment, since the facility would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments regarding public health were received either from the public or other governmental agencies.

CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the LECEF Phase 2 project. With implementation of the condition of certification included herein, as noted, staff does not expect there to be any significant adverse cancer, or short- or long-term noncancer health effects from project emissions.

Pursuant to the BAAQMD Risk Management Policy, the increased carcinogenic risk attributed to this project is considered to be not significant since it is less than 10.0-in-one million. The chronic hazard index attributed to the emission of non-carcinogenic air contaminants is considered to be not significant since it is less than 1.0. Therefore, the incremental increase in risks due to the proposed facility does not pose a significant health risk.

PROPOSED CONDITIONS OF CERTIFICATION

PH-1: The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is controlled. The Plan shall be consistent with either Staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines.

Verification: At least 30 days prior to the start of commissioning of LECEF Phase 2, the Project Owner shall provide the cooling water management plan to the CPM for review and approval.

REFERENCES

ASHRAE. 1998. American Society of Heating, Refrigeration, and Air Conditioning Engineers Legionellosis: Position Paper. June 25.

BAAQMD. 2002. Risk Management Policy for Diesel-Fueled Engines. January 11.

BAAQMD. 2003. Toxic Air Contaminant Control Program. 2001 Annual Report. Bay Area Air Quality Management District, July 2003.

BAAQMD. 2004. Toxic Air Contaminant Control Program. 2002 Annual Report. Bay Area Air Quality Management District, June 2004.

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

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commision Decision. July 2, 2002.

CTI. 2000. Cooling Technology Institute. Guidelines: Best Practices for Control of Legionella.

EPA. 1999. Environmental Protection Agency November. (EPA-822-R-99-001) “Legionella: Human Health Criteria Document.”

FDA. 1985. United States Food and Drug Administration. Federal Register. Vol. 50, No. 243. December 18.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004c. Revised Cancer Risk Assessment, July 2, 2004.

OEHHA 2003. Office of Environmental Health Hazard Assessment. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. August 2003.

ATTACHMENT A - CRITERIA POLLUTANT HEALTH EFFECTS

OZONE (O_3)

Ozone is formed when reactive organic gases are mixed with nitrogen oxides in the presence of sunlight. Heat speeds up the reaction, typically leading to higher concentrations in the summer months. Ozone is a colorless, very reactive gas which oxidizes other materials. Oxidation damages living cells and tissues by altering their protein, lipid, and carbohydrate components or products. Such damage leads to dysfunction and death of cells in the lung and in other internal tissues.

The U.S. EPA revised the federal ozone standard on July 18, 1997 (62 Fed. Reg. 38856), based on new health studies which became available since the standard was last revised in 1979. These new studies showed that adverse health effects occur at lower ambient concentrations over longer exposure times than those reflected in the previous standard, which was based on acute health effects associated with heavy exercise and short-term exposures. The U.S. EPA's proposed ozone rule lists health effects which have been attributed to result from short-term (one to three hours) and prolonged (six to eight hours) exposure to ozone (61 Fed. Reg. 65719). However, a 1999 federal court ruling blocked implementation of the ozone 8-hour standard. EPA has asked the U.S. Supreme Court to reconsider that decision.

Acute health effects induced by short-term exposures include transient reductions in pulmonary function, and transient respiratory symptoms including cough, throat irritation, chest pain, nausea, and shortness of breath with associated effects on exercise performance. Other health effects associated with short-term or prolonged O_3 exposures include increased airway responsiveness (a predisposition to bronchoconstriction caused by external stimuli such as pollen and dust), susceptibility to respiratory infection by impairing lung defense mechanisms, increased hospital admissions and emergency room visits, and transient pulmonary inflammation.

Generally, groups considered especially sensitive to the effects of air pollution include persons with existing respiratory diseases, children, pregnant women, and the elderly. However, controlled exposure data on people in clinical settings have indicated that the population at greatest risk of acute effects from ozone exposures are children and adults engaged in physical exercise. Children are most at risk because they are active outside, playing and exercising, during the summer when ozone levels are at their highest. Adults who are outdoors and engaging in activities involving heavy levels of exertion during the summer months are also among those most at risk. Exertion increases the amount of O_3 entering the airways and can cause O_3 to penetrate to peripheral regions of the lung where lung tissue is more likely to be damaged. These individuals, as well as those with respiratory illnesses, such as asthma, can experience a reduction in lung function and increased respiratory symptoms, such as chest pain and cough, when exposed to relatively low ozone levels during periods of moderate exertion.

CARBON MONOXIDE (CO)

Carbon monoxide is a colorless, odorless gas which is a product of inefficient combustion. It does not persist in the atmosphere, but is quickly converted to carbon dioxide. However, it can reach high levels in localized areas, or "hot spots".

CO reduces the oxygen carrying capacity of the blood, thereby disrupting the delivery of oxygen to the body's organs and tissues. Persons sensitive to the effects of carbon monoxide include those whose oxygen supply or delivery is already compromised. Thus, groups potentially at risk to carbon monoxide exposure include persons with coronary artery disease, congestive heart failure, obstructive lung disease, vascular disease, anemia, the elderly, newborn infants, and fetuses (CARB 1989, p. 9). In particular, people with coronary artery disease were found to be especially at risk from carbon monoxide exposure (CARB 1989, p. 9). Tests conducted on patients with confirmed coronary artery disease indicated that exposure to low levels of carbon monoxide during exercise produced significant cardiac effects. These included earlier onset of chest pain (angina) and electrocardiographic changes indicative of effects on the heart muscle (CARB 1989, p. 6). Such changes can limit the ability of patients with coronary artery disease to exert themselves even moderately. Therefore, the statewide carbon monoxide one hour and eight hour standards were adopted in part to prevent aggravation of chest pain. Additionally, however, the standards are intended to prevent decreased exercise tolerance in persons with peripheral vascular disease and lung disease, impairment of central nervous system functions, and increased risk to fetuses (Title 17, Cal. Code Regs., §70200).

PARTICULATE MATTER (PM)

Particulate matter is a generic term for particles of various substances, which occur as either liquid droplets or small solids of a wide range of sizes. Particles with the most potential to adversely affect human health are those less than 10 micrometers (millionths of a meter) in diameter (known as PM10), which may be inhaled and deposited within the deep portions of the lung (PM10). PM may originate from anthropogenic or natural sources such as stationary or mobile combustion sources or windblown dust. Particles may be emitted directly to the atmosphere or result from the physical and chemical transformation of gaseous emissions such as sulfur oxides, nitrogen oxides, and volatile organic compounds. PM10 may be made up of elements such as carbon, lead, and nickel; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and soil fragments. The size, chemical composition, and concentration of ambient PM10 can vary considerably from area to area and from season to season within the same area.

PM10 can be grouped into two general sizes of particles, fine and coarse, which differ in formation mechanisms, chemical composition, sources, and potential health effects. Fine-mode particles are those with a diameter of 2.5 micrometers or less (PM2.5), while the coarse-mode fraction of PM consists of particles ranging from 10 micrometers down to 2.5 micrometers in diameter.

Coarse-mode PM10 is formed by crushing, grinding, and abrasion of surfaces, and in the course of reducing large pieces of materials to smaller pieces. Coarse particles consist mainly of soil dust containing oxides of silicon, aluminum, calcium, and iron; as

well as fly ash, particles from tires, pollen, spores, and plant and insect fragments. Coarse particles normally have shorter lifetimes (minutes to hours) and only travel over short distances (of less than tens of kilometers). They tend to be unevenly distributed across urban areas and have more localized effects than the finer particles.

PM2.5 is derived both from combustion by-products, which have volatilized and condensed to form primary PM2.5, and from precursor gases reacting in the atmosphere to form secondary PM2.5. Components include nitrates, organic compounds, sulfates, ammonium compounds, and trace elements (including metals) as well as elemental carbon such as soot. Major sources of PM2.5 are fossil fuel combustion by electric utilities, industry and motor vehicles, vegetation burning, and the smelting or other processing of metals. Dry deposition of fine mode particles is slow allowing such particles to often exist for long periods of time (of from days to weeks) in the atmosphere and travel hundreds to thousands of kilometers. They tend to be uniformly distributed over urban areas and larger regions and are removed from the atmosphere primarily by forming cloud droplets and falling out within raindrops.

The health effects of PM10 from any given source usually depend on the toxicity of its constituent pollutants. The size of the inhaled material usually determines where it is deposited in the respiratory system. Coarse particles are deposited most readily in the nose and throat area while the finer particles are more likely to be deposited within the bronchial tubes and air sacs, with the greatest percentage deposited in the air sacs. Until recently, PM10 particles had been considered to be the major fraction of airborne particulates responsible for various adverse health effects. The PM10 fraction is known to be capable of penetrating the thoracic and alveolar regions of the human and animal lungs. The PM2.5 fraction, however, was found to pose a significantly higher risk for health. This is due to their size and associated deposition and retention characteristics in the respiratory tract, enabling it to penetrate and deposit within the deeper alveolar regions of the lung. The following aspects of PM2.5 deposition all contribute to the more serious health effects attributed to smaller particles:

- The deposition of PM2.5 favors the periphery of the lungs, which is especially vulnerable to injury for anatomical reasons.
- Clearance of the PM2.5 from within the deeper reaches of the lungs is a much slower process than from the upper regions. Consequently, the residence time is longer, implying longer exposure, and hence greater risk.
- The human anatomy further allows the penetration of the superficial tissues by PM2.5 and entry into the bodily circulation without much effort in the periphery of the lungs.

Many epidemiological studies have shown exposure to particulate matter capable of inducing a variety of health effects, including premature death, aggravation of respiratory and cardiovascular disease, changes in lung function and increases in existing respiratory symptoms, effects on lung tissue structure, and impacts on the body’s respiratory defense mechanisms. The underlying biological mechanisms are still poorly understood. Based on their review of a number of these epidemiological studies (as published after 1987 when the federal standards were revised), together with suggestion of PM2.5 concentrations as a more reliable surrogate for the health impacts

of the finer fraction of PM than PM10, the U.S. EPA concluded that the then-current standards were not sufficiently stringent to protect against significant effects in exposed humans. Therefore, federal PM standards were revised on July 18, 1997 (62 Fed. Reg. 38652) to add new annual and 24-hour PM2.5 standards to the existing annual and 24-hour PM10 standards. Taken together, these new standards were meant to provide additional protection against a wide range of PM-related health effects, including premature death, increased hospital admissions and emergency room visits, primarily among sensitive individuals such as the elderly, children and individuals with cardiopulmonary diseases such as asthma. Other impacts include decreased lung function (particularly in children and asthmatics), and alterations in lung tissue and structure.

California has also had 24-hour and annual standards for PM10 (CARB 1982, pp. 81, 84). These studies were aimed at establishing the PM10 levels capable of inducing asthma, premature death and bronchitis-related symptoms. They were set to protect against such impacts in the general population as well as sensitive individuals such as patients with respiratory disease, declines in pulmonary function, especially as related to children (Tit. 17, Cal. Code Regs., §70200). These standards were set to be more stringent than the federal standard, which the ARB regarded as inadequate for the protection desired (CARB 1991, p. 26).

On June 20, 2002, the ARB approved the adoption of a lower annual state standard for PM10, as well as a new annual standard for PM2.5 (CARB 2002). The new standards took effect on July 5, 2003. The 24-hour PM10 standard was not changed. The standards were established to prevent excess death, illnesses such as respiratory symptoms, bronchitis, asthma exacerbation, and cardiac disease, and restrictions in activity from short- and long-term exposures (Title 17, Cal. Code Regs., §70200).

NITROGEN DIOXIDE (NO_2)

Nitrogen dioxide is formed either directly or indirectly when oxygen and nitrogen in the air combine during combustion processes. It is a relatively insoluble gas which is able to penetrate deep into the lungs, its principal site of toxicity. Its toxicity is thought to be due to its capacity to initiate free radical reactions and to oxidize cellular proteins and other biomolecules (CARB 1992, Appendix A, p. 4).

Sublethal exposures in animals produce inflammation and various degrees of tissue injury characteristic of oxidant damage (Evans in CARB 1992, Appendix A, p. 5). The changes produced by low-level acute or subchronic exposure appear to be reversible when animals are allowed to recover in clean air.

Health effects of particular concern in relation to low-level nitrogen dioxide exposure include: (1) effects of acute exposure on some asthmatics and possibly on some persons with chronic bronchitis, (2) effects on respiratory tract defenses against infection, (3) effects on the immune system, (4) initiation or facilitation of the development of chronic lung disease, and (5) interaction with other pollutants (CARB 1992, Appendix A, p. 5).

Several groups which may be especially susceptible to nitrogen dioxide related health effects have been identified (CARB 1992, Appendix A, p. 3). These include asthmatics, persons with chronic bronchitis, infants and young children, cystic fibrosis and cancer patients, people with immune deficiencies, and the elderly.

Studies using controlled brief exposures on sensitive groups have shown an increase in bronchial reactivity or airway responsiveness of some asthmatics, and decreased lung function in some patients with chronic obstructive lung disease (CARB 1992, Appendix A, p. 2). In general, bronchial hyperreactivity (an exaggerated tendency of the airways to constrict) is markedly greater in asthmatics than in nonasthmatics upon exposure to respiratory irritants (CARB 1992a, p. 107). At exposure concentrations relevant to the current one hour ambient standard, there appears to be little, if any, effect on respiratory symptoms of asthmatics (CARB 1992a, p. 108).

SULFUR DIOXIDE (SO_2)

Sulfur dioxide is formed when any sulfur-containing fuel is burned. SO_2 is highly soluble and consequently absorbed in the moist passages of the upper respiratory system. Exposure to sulfur dioxide can cause changes in lung cell structure and function that adversely affect a major lung defense mechanism known as muco-ciliary transport. This mechanism functions by trapping particles in mucus in the lung and sweeping them out via the cilia (fine hair-like structures) also in the lung. Slowed mucociliary transport is frequently associated with chronic bronchitis.

Exposure to sulfur dioxide can produce both short- and long-term health effects. Therefore, California has established sulfur dioxide standards to reflect both short- and long-term exposure concerns. Based on controlled exposure studies of human volunteers, investigators have found that asthmatics comprise the group most susceptible to adverse health effects from exposure to sulfur dioxide (CARB 1994, p. V-1).

The primary short-term effect is bronchoconstriction, a narrowing of the airways which results in labored breathing, wheezing, and coughing. The short-term (one hour) standard is based on bronchoconstriction and associated symptoms (such as wheezing and shortness of breath) in asthmatics and is designed to protect against adverse effects from five to ten minute exposures. In the opinion of the California Office of Environmental Health Hazard Assessment, the short-term ambient standard is likely to afford adequate protection to asthmatics engaged in short periods of vigorous activity (CARB 1994, Appendix A, p. 16).

Longer-term exposure is associated with an increased incidence of respiratory symptoms (e.g., coughing and wheezing) or respiratory disease, decreases in pulmonary function, and an increased risk of mortality (CARB 1991a, p. 12). The long-term (24 hour) standard is based upon increased incidence of respiratory disease and excess mortality. The standard includes a margin of safety based on epidemiological studies which have shown adverse respiratory effects at levels slightly above the standard. Some of the studies indicate a sulfur dioxide threshold for effects, whereby "no adverse effects" are expected from exposures to concentrations at the state standard (Ibid.).

REFERENCES

CARB. 1982. California Air Resources Board. California Ambient Air Quality Standard for Particulate Matter (PM_{10}). December.

CARB. 1989. California Air Resources Board. Adequacy of the Statewide Carbon Monoxide Ambient Air Quality Standard: The Impact of Recent Health Effects Studies. Staff Report. December.

CARB. 1991. California Air Resources Board. Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide. April 11.

CARB. 1991a. California Air Resources Board. Amendments to Regulations for the 24-Hour Ambient Air Quality Standard for Sulfur Dioxide. Staff Report. August.

CARB. 1992. California Air Resources Board. Review of the One-Hour Ambient Air Quality Standard for Nitrogen Dioxide. Staff Report. December.

CARB. 1992a. California Air Resources Board. Review of the One-Hour Ambient Air Quality Standard for Nitrogen Dioxide. Technical Support Document. December.

CARB. 1994. California Air Resources Board. Review of the One-Hour Ambient Air Quality Standard for Sulfur Dioxide. Staff Report. December 27.

CARB. 2002. California Air Resources Board. Resolution 02-24. June 20, 2002.

FDA. 1985. United States Food and Drug Administration. Federal Register. Vol. 50, No. 243. December 18.

Kleinman et al. 1989. Effects on Human Health of Pollutants in the South Coast Air Basin. Final Report to the South Coast Air Quality Management District. June.

SOCIOECONOMICS

Testimony of Joseph Diamond, Ph.D.

INTRODUCTION

In this California Energy Commission (Energy Commission) socioeconomic impact analysis, staff evaluated the project induced changes on community services and/or infrastructure and included an environmental justice screening analysis. Direct, indirect, induced, and cumulative impacts are also included. Staff discusses the estimated impacts of the construction and operation associated with conversion to combined cycle operation (Phase 2) of the Los Esteros Critical Energy Facility (LECEF) on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

California Government Code, sections 65996-65997 place levies against development projects near school districts. As amended by SB 50 (Stats. 1998, ch. 407, Sec. 23), public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

ENVIRONMENTAL SETTING

The LECEF is located in the Alviso area of northern San Jose, in Santa Clara County. Santa Clara County comprises the San Jose Metropolitan Statistical Area (MSA).[1] Santa Clara County, and its major city San Jose, are well within a two-hour one-way commute distance of the power plant site, and are also the area in which construction and operations workers may live. The applicant and staff utilized the Santa Clara County labor market area for the evaluation of construction and operation worker availability and community services and infrastructure impacts from construction and operation. Santa Clara County was used as the study area in identifying non-fiscal (private sector) benefits from the LECEF.

ANALYSIS AND IMPACTS

Staff reviewed the current LECEF AFC, Vol. I, Santa Clara County Socioeconomic section and socioeconomic data adequacy responses (LECEF, LLC. 2004a). Based on staff's use of the socioeconomic data provided and referenced from governmental agencies, trade associations and staff's independent analysis, staff agrees with the applicant's socioeconomic analysis and conclusions.

[1] Most of the environmental and economic impacts identified are based on using Santa Clara County as the study area because it is most likely to be impacted by the project. The economic impact analysis, which used IMPLAN, an input-output model explained later on in this section, was done for Santa Clara County.

In this analysis staff used fixed percentage criteria for housing and environmental justice in the evaluation of potential impacts. For housing, staff uses a vacancy rate of five percent or less of permanent available housing, and for environmental justice, staff uses a threshold of greater than 50 percent for minority/low-income population in the affected area. Criteria for subject areas such as fire protection, water supply and wastewater disposal are analyzed in other sections of this staff assessment. Educational impacts are subjectively determined but are moot, as described later in the testimony. Impacts on medical services, law enforcement, or community cohesion are based on subjective judgments or input from local and state agencies. In general, substantial non-local employment has the potential to result in significant socioeconomic impacts in the study area.

EMPLOYMENT AND ECONOMY

According to the LECEF AFC, 60 percent of the construction workforce will live in Santa Clara County. Construction workers number about 82 (See Table 8.10-10 of the AFC) though 84 was also reported in the AFC. Operations workers number 17 full-time employees. This represents an increase of 8 employees compared to Phase I and they will be drawn from the local labor force.

The average commute time is defined as distances that involve up to a one-hour, one-way commute for construction and operations employees. However, construction workers generally commute as much as two hours (one-way). This defines the local labor market. Construction workers who live in communities at greater distances than a two-hour one-way commute tend to relocate to the project area for the work week, and then return home on the weekend. Operations workers tend to live within a one-hour, one-way commute, and if they live outside this area, they would likely relocate. The “non-local” workers for the LECEF project are estimated to be 40 percent for construction and zero for operations. There is sufficient available workforce within 30 miles of the LECEF project that the LECEF project will not need to draw on other areas for construction workforce. For construction, the applicant expects that less than five percent of the projects workforce would relocate to the project area (LECEF, LLC. 2004a). Staff agrees.

The following **Socioeconomics Table 1** shows that available labor, by skill, in Santa Clara County is considerable when compared to the LECEF project needs.

SOCIOECONOMICS Table 1
Available Labor by Skill for Construction and Operations

Occupational Title	Annual Averages 1997	2004 (Estimated)	Maximum (Monthly) Number Of Construction Workers Needed For The Project (includes power plant and transmissions lines)
Construction Manager	1,290	1,890	N/A
Surveying and Mapping Scientists	120	150	N/A
Carpenters	6,010	8,220	12
Electricians	4,280	5,930	22
Plumbers and pipe fitters	3,080	4,150	N/A
Pipe layers	100	140	20
Sheet metal duct installers	370	550	4
Welders and Cutters	1,110	1,340	N/A
Truck drivers, heavy	4,640	5,300	2
Helpers, laborer	28,850	38,550	20
Boilermaker	N/A	N/A	16
Cement Mason	N/A	N/A	6
Iron Worker	N/A	N/A	28
Millwright	N/A	N/A	10
Operator	N/A	N/A	6
Insulator	N/A	N/A	6
Painter	N/A	N/A	4

Source: CEC 2001, LECEF, LLC. 2003, and De Young 2004b.

Santa Clara County has a fairly large workforce of 876,000 as of January 2004 (State of California 2004). The number of workers needed for the peak construction activity period for the LECEF project represents less than 1 percent of the January 2004 workforce.

The Impact Analysis For Planning (IMPLAN) model (an input-output model), used by the applicant to estimate employment impacts from the LECEF project on the study area, is widely used and acceptable to staff. The University of California at Berkeley uses the IMPLAN model for regional economic assessment, and it has been used to assess other generating projects in California and the U.S. It is a common regional economic tool. In general, most multipliers are estimated by showing the total change divided by the initial change. For example, employment multipliers refer to the total additional employment stimulated by the new economic activity. IMPLAN is a disaggregated type of input-output model that divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). Social Accounting Matrix (SAM)[2] multipliers were used for the applicant's economic impact analysis. SAM multipliers are

[2] Type SAM multipliers capture inter-institutional transfers and account for social security and income tax leakages, institutional savings, and commuting.

similar to Type II[3] multipliers because they both include the indirect and induced effects (secondary impacts). An IMPLAN SAM variety employment multiplier of 1.6 was used for construction (i.e., 82 was used in the IMPLAN estimates) new construction job's income supports approximately 45 indirect and induced jobs in the regional economy for a total of 127 jobs)[4]. An IMPLAN SAM variety employment multiplier of 1.9 was used for operations indicating that the 17 direct jobs support approximately 16 indirect and induced jobs in the regional economy, resulting in a total of 33 jobs. An IMPLAN SAM variety construction income multiplier of 1.2 for the base case was used that resulted in a secondary impact of $1,795,888 and a total impact of $9,464,520. Finally, an IMPLAN SAM variety operation income multiplier of 1.3 was used that resulted in a secondary impact of $1,037,847 and a total impact of $4,544,847.[5] These multipliers are within an acceptable range of 2 to 2.5 over the long run often cited by many economists (Moss et al. 1994). Therefore, staff considers these projected beneficial economic impacts to be reasonable.

Project construction (power generation and electric power transmission) is expected to occur over a 19 month period. The greatest number of construction workers (peak), estimated to be 144 workers, will be needed in the 11th month of construction. The number of construction workers will range from 24 in the first month of construction to approximately 144 workers in the 11th month of construction. These workers will come mainly from the local area.

The preliminary unemployment rate for Santa Clara County was 7.0 percent in January 2004, not seasonally adjusted. For California, during that period the unemployment rate was 6.7 percent (State of California 2004).

Staff accepts the applicant's estimate that the non-local construction workforce (approximately 40 percent of the total average construction workforce or 34) would come from outside of Santa Clara County (LECEF 2003). It is unlikely that the workers would bring their families due to the seasonal nature of the work.

During operation of the project, about 17 workers will be needed to maintain and operate the project. Of the 17 operational workers, 8 new employees register an increase from Phase 1 and are expected to come from Santa Clara County. Staff agrees with the applicant that while there may be a small increase in employment, it will not have a significant impact on local employment.

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[3] A Type I multiplier is the ratio of the direct plus indirect change to the direct change resulting from a unit increase in final demand for any given sector. A Type II multiplier is the ratio of the direct, indirect, and induced change to the direct change resulting from a unit increase in final demand. The Type II multiplier takes into account the repercussionary effects of secondary rounds of consumer spending in addition to the direct and indirect interindustry effects (Richardson 1972). Both multipliers can be of an income or employment type.

[4] Based on $9.06 million in local construction payroll.

[5] All project construction and operations economic estimates are presented in 2008 dollars (De Young 2004a).

POPULATION

The project is located in the Alviso area of northern San Jose in Santa Clara County. The 2000 U.S. Census shows California with a total population of 33,871,648, minority population of 18,054,858 (53.3 percent), and a white (non-Hispanic) population of 15,816,790 or (46.7 percent). For Santa Clara County, the 2000 Census shows a total population of 1,682,585, minority 938,303 (55.8 percent), and a white population of (non-Hispanic) 744,282 or 44.2 percent. The population of San Jose was 894,943 in 2000, minority 572,409 (64 percent), and a white population of 322,534 (36 percent). By 2010, California is expected to grow to 39,958,000, Santa Clara County 1,879,000 and the City of San Jose 1,060,300 (LECEF, LLC, 2003). As mentioned under the **Employment** section, the majority of construction and operation labor will be local so there would be little induced population growth from the LECEF2 project. Furthermore, there would be no displacement of population by the LECEF2 project.

HOUSING

According to federal standards, permanent housing is considered to be in short supply if the vacancy rate is less than five percent (URS 2000). As of January 1, 2000, there were approximately 579,329 housing units in Santa Clara County and an additional 281,841 housing units in the City of San Jose (see Table 8.10-3 of the AFC). The vacancy rate for this housing averages approximately 2.3 percent for Santa Clara County and 1.9 percent for the City of San Jose. There are about 8,500 rooms in the City of San Jose with an average vacancy rate of 49 percent (Shultze 2004). The housing units available to non-local construction workers for this project are sufficient for worker needs. The majority of the construction workforce, and the entire operations workforce, are expected to be drawn from the local labor force. Also, non-local construction workers typically stay in hotel/motels.

The LECEF project is located in San Jose, Santa Clara County and will result in no displacement of housing.

FISCAL

The LECEF Phase 2 project total construction costs are approximately $100 million. The estimated value of local construction expenditures (within Santa Clara County) during construction is $ 7.0 million. Sales tax is paid on material and supply expenditures. The sales tax rate of 8.0 percent in Santa Clara County is comprised of the state sales tax rate (5.75 percent), one percent to the place of sale, 0.25 percent to the county transportation authority, 0.5 percent to county transit districts, and 0.5 percent to the county general fund. The total sales tax estimated during construction is $560,000 with $402,500 going to the state, $70,000 to places of sale, $17,500 to the county transportation authority, $35,000 to the general fund, and $35,000 to the transit district.

The construction payroll is $15.1 million. The total average payroll for the operation phase is estimated to be $957,000 annually. In addition, there are local expenditures of $400,000 per year. The estimated annual sales tax during operation at 8.0 percent times the cost of purchasing locally purchased materials would be approximately $32,000 with $23,000 to the state, the place of sale (city or county) $4,000, $1,000 to

the county transportation authority, the county general fund $2,000, and $2,000 to the county transit district (LECEF, LLC., 2003).

Property taxes for Phase 2 of the LECEF can not be estimated by the California Board of Equalization (BOE) (Lundin 2004) but will be paid when the construction is complete on an annual basis. The LECEF power plant property taxes will continue to be a major contributor to the tax base of Santa Clara County and the City of San Jose. The BOE has assumed (commencing January 1, 2003) the assessment responsibility for electric generating facilities that have a generating capacity of 50 megawatts or more, and are not a qualifying facility or a cogeneration facility, pursuant to AB 81 and amended Property Tax Rule 905. Once the BOE has determined the assessed value of the facility, they will deliver the value to the local tax jurisdiction where the facility is located and the local taxing jurisdiction will apply and collect the appropriate tax.

SCHOOLS

There are a total of 35 elementary, high school, and unified school districts in Santa Clara County. The project is located in Santa Clara Unified School District. This district has 23 schools, had a 2002-2003 enrollment of 13,623 students with an average pupil to teacher ratio of 20.0 and an average class size of 27.8. Santa Clara County, on the other hand, had an average pupil to teacher ration of 19.9 and an average class size of 26.5 (LECEF, LLC. 2003).

Staff agrees with the applicant that most non-local construction workers (40 percent or 58 workers for the peak and 34 workers for the average) will probably not bring their families for the 19-month project. During the operations phase, even if all of the 17 operating employees were to relocate and live in San Jose, which is not likely to be the case, it would not result in a significant adverse impact. Assuming an average family size of 3.14 (US 2000 Census) this would result in about 19 children added to the local schools. This would result in a less than one-percent increase in enrollment for the base year of 2002-2003 for the Santa Clara Unified School District. Overall, staff expects no significant impact on study area schools.

Education Code section 17620 states that public agencies may not impose fees, charges or other financial requirements to offset the cost for “school facilities.” School facilities are defined as “any school-related consideration relating to a school district’s ability to accommodate enrollment.” Local and state agencies are precluded from imposing (additional) fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools.

Local agencies charge a one-time assessment of $.33 per square foot of principal building area for industrial development within a school district. Since there are no new principal buildings associated with LECEF Phase 2, there are no new school impact fees.

POLICE PROTECTION

The AFC (Section 8.10.1.6 Law Enforcement) notes that the proposed LECEF Phase 2 project will be served by the San Jose Police Department which has 1,300 sworn police officers, 429 civilian support personnel, 350 patrol cars and other equipment. It has an

average response time of 90 seconds to 4.5 minutes to the “R” District which is where the project is located in the northern part of the City. The Santa Clara County Sheriff’s Department could provide support to the San Jose Police Department. LECEF is close to the City of Milipitas, and their police department could provide additional regular and emergency support. The California Highway Patrol (CHP) is primarily responsible for state highways and roads.

The LECEF project would not significantly increase the existing demand for police service or adversely affect police protection in and around the LECEF project area (LECEF, LLC. 2003). There would be a small increase in population during the 19 months of construction and during operation, but most of the workforce will be local (LECEF, LLC. 2003).

MEDICAL SERVICES/UTILITIES

AFC Section 8.10.1.6, Public Services, discusses the medical services available to the facility. There are 15 hospitals with emergency rooms in Santa Clara County. The Santa Clara County Medical Center (SCVMC) is 10 miles from the project site and is a publicly owned full service hospital with 394 beds. The Santa Clara Kaiser Permanente Medical Center is approximately 7.5 miles from the site. This is a 336 bed full-service hospital.

Water and wastewater discharge are discussed in a separate Final Staff Assessment (FSA) section entitled **Soil and Water Resources**. The Phase 2 LECEF will connect to a new Silicon Valley Power (SVP) switching station and PG&E will deliver natural gas. Adequate supplies of electricity are available for LECEF’s construction, and sufficient natural gas is available for LECEF’s Phase 2 combined-cycle operation which is discussed in the FSA **Reliability** section. Fire protection is discussed in the FSA section entitled **Worker Safety and Fire Protection**. Solid waste removal is discussed in the FSA section entitled **Waste Management**.

Finally, Phase 2 of the LECEF project will not directly or indirectly induce substantial population growth. Hence, there are no significant socioeconomic impacts that might trigger adverse physical impacts in the provision of public services

CUMULATIVE IMPACTS

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that can not be met by local labor, resulting in an influx of non-local workers and their dependents.

According to the applicant, there are no other large industrial projects in the general project area being considered by the City of San Jose (LECEF, LLC. 2003). No additional large industrial projects were found in Santa Clara County, Milpitas, and the City of San Jose (Buikem, Fujimoto, and Walsh 2005).

Staff in doing the **Traffic and Transportation section** identified eight projects in the region that lie within two miles of the proposed LECEF that could affect the regional traffic and transportation network. These projects are as follows:

- Northeast San Jose Transmission Reinforcement Project – Approved; construction date is unknown.
- US DataPort Facility - Approved but on hold; construction activity is unknown.
- Palm Corporation Industrial Campus – Approved but on hold; construction date is unknown.
- Cisco Systems Industrial Campus - Approved but on hold; construction date is unknown.
- Irvine Company Apartment Complex – Approved and under construction.
- Veritas Software Industrial Campus – Approved and under construction.
- Irvine Company Business Park – Approved and under construction.
- Office Park Developments – Approved and under construction.

Four of the eight projects are either on hold or have an undetermined construction schedule. The new LECEF project would not result in any significant adverse socioeconomic impacts to population or housing, or public services due to the small size and temporary nature of construction. Therefore, it is unlikely that it would contribute significantly to cumulative socioeconomic impacts. Staff concludes that there are no significant adverse cumulative socioeconomic impacts associated with the construction and operation of the LECEF's Phase 2 conversion to combined-cycle operation.

MINORITY AND LOW-INCOME POPULATIONS (ENVIRONMENTAL JUSTICE SCREENING ANALYSIS)

The purpose of the environmental justice screening analysis is to determine whether a low-income and/or minority population exists within proximity to the proposed site. Staff conducted the screening analysis in accordance with the "Guidance for Incorporating Environmental Justice Concerns in [the Environmental Protection Agencies'] EPA's [National Environmental Policy Act] NEPA Compliance Analysis," (EPA 1998). Minority populations, as defined by this Guidance, are identified where either:

- the minority population of the affected area is greater than fifty percent of the local area's general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis; or
- one or more census blocks in the local area have a minority population greater than 50 percent.

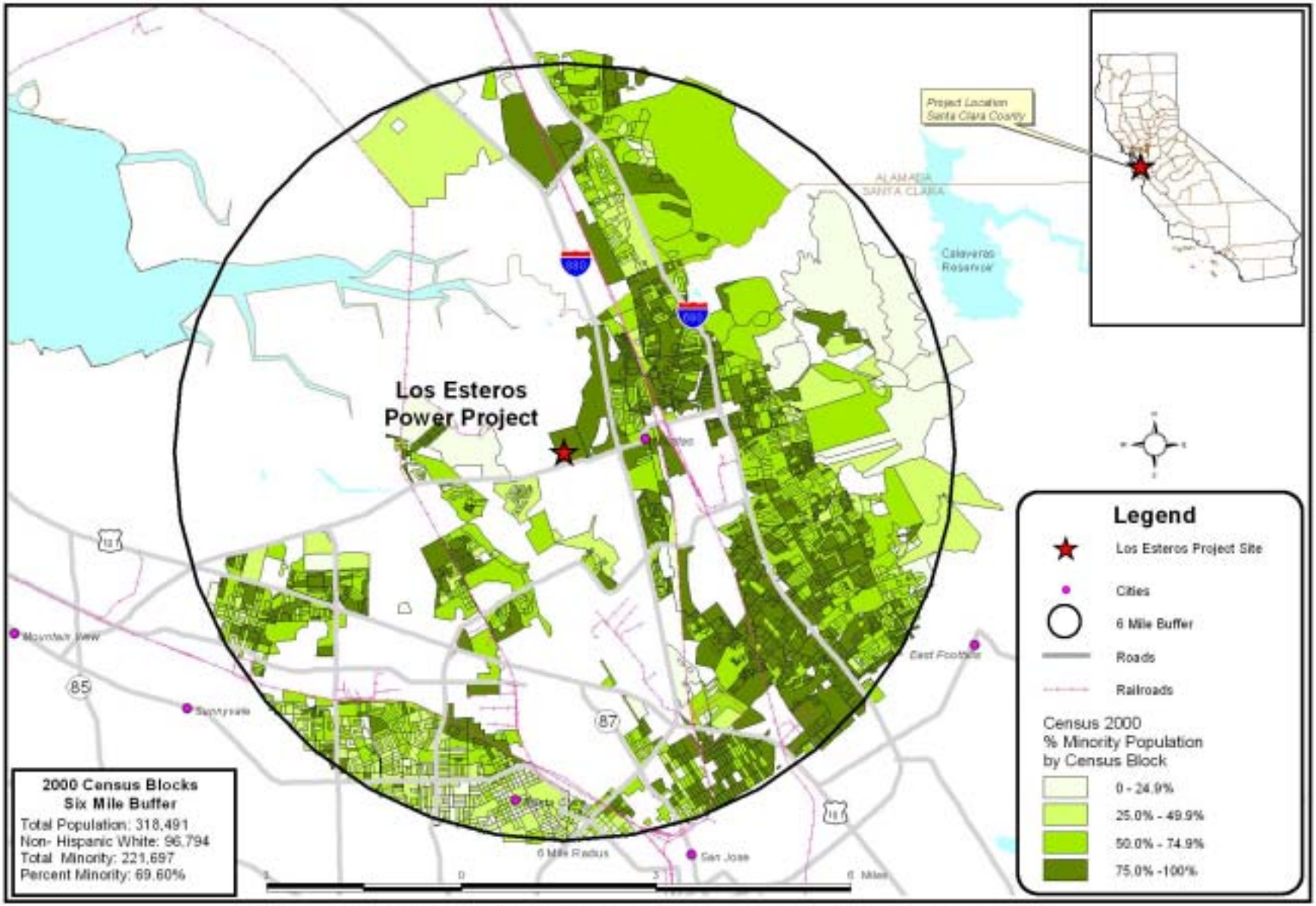
In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance that defines minority as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. Low-income populations are identified with the annual statistical poverty thresholds from the Bureau of the Census's Current Population Reports, Series P-60 on Income and Poverty (OMB 1978).

Staff has reviewed Census 2000 information within a six-mile radius of the proposed LECEF Phase 2 power plant that shows overall the minority population is 69.60 percent, which exceeds staff's threshold of greater than 50 percent (See **Socioeconomics Figure 1**). In addition, there are also pockets (census blocks) with greater than 50 percent minority population. Census 2000 by census block group shows that the low-income population is 7.51 percent within the same radius. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old.

For a listing of other technical sections that include an EJ analysis as well as a summary of environmental justice impacts regarding these other sections, please see the **Executive Summary**.

SOCIOECONOMICS - FIGURE 1

Los Esteros Phase 1 & 2 Power Project - Census 2000 Minority Population by Census Block - Six Mile Buffer



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: California Energy Commission Statewide Transmission & Power Plant Maps 2004, Census 2000 PL 94-171 Data - Matrix PL2

MITIGATION

Staff has not identified any significant adverse socioeconomic impacts associated with the LECEF's Phase 2 conversion to combined-cycle operation.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

There are estimated gross benefits from the LECEF Phase 2 project which include increases in sales taxes, employment, and income for Santa Clara County. For example, there are estimated to be 84 direct project-related construction jobs for 19 months of construction, resulting in 129 total jobs that will be created, of which 45 are secondary (indirect and induced) jobs. Secondary construction income impacts are estimated at $1,795,888 with the total $9,464,520. For operations, 17 direct jobs will be created with 16 secondary (indirect and induced) jobs for a total of 33 jobs. Secondary operation income impacts are estimated at $1,037,847 with a total of $4,543,847. The total sales tax during construction is estimated to be $560,000. Annual property taxes for the LECEF Phase 2 are not currently available but expected to be substantial.

Staff finds that the LECEF project will not cause a significant adverse socioeconomic impact on the study area's housing, schools, police, emergency services, hospitals, and utilities. Based on staff's demographic screening analysis, the minority population within six miles of the proposed power plant site is greater than 50 percent but the low-income population within six miles of the proposed power plant site is less than the 50 percent threshold. Staff finds that there would be no significant adverse socioeconomic impacts since most of the construction and operation workforce is within the regional or local labor market area and construction activities are short-term. Staff has determined that there would be no significant adverse direct or cumulative socioeconomic impacts.

The LECEF Phase 2 project, as proposed, is consistent with the applicable socioeconomic LORS.

The following **Socioeconomics Table 2** provides a summary of socioeconomic data and information from this analysis, with emphasis on economic benefits of the LECEF Phase 2 project, conversion to combined-cycle operation.

PROPOSED CONDITIONS OF CERTIFICATION

None.

SOCIOECONOMIC DATA AND INFORMATION - TABLE 2[6]	
Project Construction Costs	$100 million
Estimate of Locally Purchased Materials	
Construction	$5.8 million
Operation	$1.8 per year
Estimated Annual Property Taxes	N/A
Estimated School Impact Fees	None required. No building expansion.
Direct Employment	
Construction (average)	82 jobs
Operation	17 jobs
Secondary Employment	
Construction	45 jobs
Operation	16 jobs
Direct Income	
Construction	$7,668,632
Operation	$3,507,000
Secondary Income	
Construction	$1,795,888
Operation	$1,037,847
Payroll	
Construction	Total-$15.1 million.
Operation	Average: $957,000 annually.
Estimated Sales Taxes (on equipment and materials)	
Construction	$560,000
Operation	$32,000 annually.
Existing /Projected Unemployment Rates	Existing – 7 percent in January 2004, not seasonally adjusted for Santa Clara County. Projected - Not available.
Percent Minority Population (6 mile radius)	69.60 percent
Percent Poverty Population (6 mile radius)	7.51 percent

[6] Table 2 uses 2008 dollars (De Young 2004a), construction is for 19 months, and project life planned for 30 years. Economic (non-fiscal and fiscal) impacts, unemployment, and population information are generally for Santa Clara County. However, the results of IMPLAN/Input-Output modeling are for Santa Clara County and show secondary, indirect and induced impacts, as well as direct impacts.

REFERENCES

Baikema, Richard. 2005. San Jose Department of City Planning and Building. Telephone Conversation with Joseph Diamond regarding Socioeconomic Cumulative Impacts, May 13, 2005.

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

De Young, S. 2004a. Calpine. Telephone Conversation with Joseph Diamond regarding Year of dollar estimates for construction, operation, and secondary economic impact estimates. April 9, 2004.

De Young, S. 2004b. Calpine. Telephone Conversation with Joseph Diamond regarding Clarification of Table 8.10-10 in the Los Esteros 2 AFC. June 16, 2004

EPA (U. S. Environmental Protection Agency). 1998. Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis. April, 1998.

Fujimoto, Troy. 2005. Milpitas City Planning Department. Telephone Conversation with Joseph Diamond regarding Socioeconomic Cumulative Impacts, May 13, 2005.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March 8, 2004.

Lewis, Eugene, Russell Youmans, George Goldman, Garnet Premer. 1979. Economic Multipliers: Can a rural community use them? Western Rural Development Center 24.

Lundin, J. and Yamamoto, J. 2004. California Board of Equalization and Santa Clara County Tax Assessor's Office. Telephone conversation with Joe Diamond (California Energy Commission) regarding property taxes for LECEF2. April 12 and 13, 2004.

Moss, Steven J., Richard J. McCann, and Marvin Feldman. 1994. A Guide for Reviewing Environmental Policy Studies. Spring.

OMB (Office of Management and Budget). 1978. Statistical Policy Directive No. 14 Definition Of Poverty For Statistical Purpose. May.

Richardson, Harry W. 1972. Input-Output and Regional Economics.

Shultze, M. 2004. San Jose Convention and Visitors Bureau. Telephone conversation with Joe Diamond (California Energy Commission) regarding 2003 Hotel/Motel vacancy rates. March 19, 2004.

State of California, Employment Development Department, California Labor Market Review, February 2004.

US Census 2000. Highlights from the Census 2000 Demographic Profiles.

URS (Huntington Beach Project). 2000. Application for Certification, Huntington Beach Generating Project (00-AFC-13). Submitted to the California Energy Commission, December 1, 2000.

Walsh, Carolyn. 2005. Santa Clara County Planning Agency. Telephone Conversation with Joseph Diamond regarding Socioeconomic Cumulative Impacts, May 13, 2005.

SOIL AND WATER RESOURCES

Testimony of John Kessler

INTRODUCTION

This section analyzes potential effects on soil and water resources by the Los Esteros Critical Energy Facility (LECEF) Phase 2 expansion from a simple cycle powerplant to a combined cycle generating plant. Since the LECEF simple-cycle facility is built and operating, this Phase 2 analysis begins with Phase 1 as a base case for review. The analysis of LECEF Phase 1 was published in the Staff Assessment dated November 15, 2004, and the Energy Commission Decision relicensing Phase 1 taken on March 16, 2005. A brief summary of the relevant issues is included herein. The LECEF Phase 2 analysis specifically focuses on the potential for the project to:

- accelerate wind or water erosion and sedimentation;
- exacerbate flood conditions in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade surface or groundwater quality; and
- comply with all applicable laws, ordinances, regulations and standards (LORS).

The primary issues identified by staff in this Phase 2 analysis consider the efficient use of recycled water, effects of the LECEF wastewater discharge on the overall quality of recycled water in the South Bay Water Recycling (SBWR) Program, and the quantity/quality of storm water discharged into Coyote Creek. Staff believes the applicant has worked diligently with Randolph Shipes, Deputy Director, Environmental Services Department, Watershed Protection, City of San Jose and the Santa Clara Valley Water District (SCVWD) to resolve these issues, including providing updated projections of recycled water demands and quantity/quality estimates of wastewater to be discharged to the San Jose/Santa Clara Water Pollution Control Plant (WPCP). Where the potential for impacts is identified, staff has proposed mitigation measures to reduce the significance of the impact and, as appropriate, has recommended revisions to the original conditions of certification. Staff concludes that there will not be any significant adverse impacts to soil and water resources as a result of the proposed LECEF Phase 2 Project.

Solid waste disposal is also discussed in the **Waste Management** section, as are land use effects in the **Land Use** section of this Staff Assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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

Applicable Law	Description
Federal	
Clean Water Act	The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality, which includes regulation of storm water discharges during construction and operation of a facility. These are normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit. For the LECEF Project, regulation of water quality is administered by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB).
Resource Conservation and Recovery Act	The Resource Conservation 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.
NRCS *National Engineering Handbook, 1983,* sections 2 and 3	The handbook provides standards for soil conservation during planning, design, and construction activities.
Section 404 Permit to Place or Discharge Dredged or Fill Material	Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. The Army Corps of Engineers (ACOE) issues site-specific or general (nationwide) permits for such discharges.
Section 401 Water Quality Certification	Section 401 of the Clean Water Act provides for state certification that federal permits allowing discharge of dredged or fill material into waters of the United States will not violate federal and state water quality standards. These certifications are issued by the RWQCBs. Proposed linear facilities can also cross ephemeral drainages that are considered waters of the United States.
State	
California Constitution, Article X, Section 2	This section requires that the water resources of the State be put to beneficial use to the fullest extent possible. The waste, unreasonable use, or unreasonable method of use of water is prohibited.
Porter-Cologne Water Quality Control Act	The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. In addition, discharges to land for the protection of surface and groundwater are regulated under Title 23, California Code of Regulations, Chapter 15, Division 3. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
California Water Code	California Water Code 13550 requires the use of reclaimed water for industrial purposes subject to reclaimed water being available and meeting certain conditions. California Water Code Section 13260 requires that, as part of the NPDES permit, any person discharging waste, or proposing to discharge

	waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system must submit a report of waste discharge to the RWQCB.
The California Safe Drinking Water and Toxic Enforcement Act	This Act (California Health & Safety Code Section 25249.5 et seq.) prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The requirements of the Act are administered by the RWCQB.
Recycling Act of 1991	The Water Recycling Act of 1991 (Water Code § 13575 et seq.) encourages the use of recycled water whenever possible.
Water Recycling Criteria	Under Title 22 of the California Code of Regulations § 60301 et seq., the California Department of Health Services (DHS) reviews and approves wastewater treatment systems to ensure they meet tertiary treatment standards allowing use of reclaimed water for industrial processes such as steam production and cooling water.
SWRCB Resolutions 75-58	The principal policy of the State Board, which addresses the specific siting of energy facilities, is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound.
SWRCB Resolution 77-1	Resolution 77-1 encourages and promotes reclaimed water use for non-potable purposes.
SWRCB Resolution 68-16	Resolution 68-16 (the Anti-Degradation Policy) promotes maintaining existing high quality waters to the maximum extent possible, and requires any activity that discharges a waste to high quality waters to provide the best practicable treatment necessary to maintain the highest quality water.
Energy Commission IEPR 2003	Consistent with State Water Resources Control Board Policy 75-58 and the Warren-Alquist Act, the Energy Commission will approve the use of fresh water for cooling purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound.”
Local	
Santa Clara Valley Water District (SCVWD) - Storm Water Outfall Construction Permit	Santa Clara Valley Water District (SCVWD) requires a Storm Water Outfall Construction Permit in accordance with Ordinance No. 83-2 for the storm water outlet and discharge of flows into Coyote Creek, a designated floodway under SCVWD’s jurisdiction.
City of San Jose – Grading Requirements	The City of San Jose has established requirements for grading, excavation and drainage.
City of San Jose – Recycled Water User Agreement	City of San Jose, Environmental Services Department, Watershed Protection, as administrator for the South Bay Water Recycling (SBWR) Program, has established rules and regulations for the users of program’s recycled water.
City of San Jose – Industrial Wastewater Discharge Permit	City of San Jose regulates wastewater discharges to the San Jose/ Santa Clara Water Pollution Control Plant (WPCP) via the sewer system (Municipal Code chapter 15.14, Ordinance No. 24800). Industrial wastewater dischargers must obtain an Industrial Wastewater Discharge Permit in compliance with these requirements.

ENVIRONMENTAL SETTING

REGIONAL AND VICINITY DESCRIPTION

The existing LECEF power plant occupies 21 acres of a 34-acre site in the Alviso area of northern San Jose, situated northwest of the intersection of Highways 880 and 237 in Santa Clara County. As part of the Phase 2 expansion, the applicant will construct and operate a steam turbine generator, a six-cell cooling tower, and heat recovery steam generator (HRSG) tube sections and associated equipment and piping. Construction activities to install this equipment will affect between 20 and 40 percent of the existing site. As proposed, the remaining 13 acres of the site will be used for equipment laydown and parking during the construction of Phase 2. For a more complete discussion of Phase 1 and Phase 2 equipment and activities, please refer to the **PROJECT DESCRIPTION** section of this final staff assessment (FSA), and the FSA for Phase 1.

Land uses in the vicinity of the LECEF are a combination of agriculture, commercial, residential, industrial, public facilities and major highways. North of the site is the new Silicon Valley Power Switching Station and the PG&E Los Esteros Substation. To the northwest lies the City of San Jose/Santa Clara Water Pollution Control Plant (WPCP) and north of the substation is the WPCP sludge drying ponds and yards. To the west of LECEF lie WPCP buffer lands. Actively cultivated row crops are found in the parcel immediately east of LECEF. Highway 237 and dense urban development are located south of the site.

SOIL

Prior to conversion to industrial use, the site was primarily used for agriculture. Orchard trees occupied the site before 1980 when they were removed and replaced with green houses used to grow potted plants and flowers. As discussed in the original proceeding, the LECEF site is characterized as prime agricultural land. Soil types affected by the construction and operation of the project are Mocho Loam (Mq), Mocho Clay Loam (Mi), and Mocho Loam over Campbell- and Cropley-like soil (Mo). These soils are formed from sandstone and shale rock from recent fluvial deposition (see **Soil and Water Table 2**).

SOIL AND WATER Table 2
Soil Types & Characteristics

Primary Soil Name	Slope Class %	Depth Range	USDA Texture	Parent Material	Water Erosion Hazard	Permeability	Drainage	Revegetation Potential
Mocho Loam (Mq)	1 – 3	0 – 6 ft.	Loam	Alluvium from sedimentary rocks	Slight	Moderate	Well Drained	Good in low alkali soil
Mocho Clay Loam (Mi)	0 – 1	N/A	Clay Loam	Alluvium from sedimentary rocks	Slight	Moderate to Slow	Well Drained	Very Good to Good in low alkali soil
Mocho Loam Over Campbell & Cropley-like Soil (Mo)	1 – 3	N/A	Loam over Clay Loam	Alluvium from sedimentary rocks	Slight	Moderate to Slow	Well Drained	Very Good

(LECEF, LLC. 2003)

Soil and Water Contamination

A Phase I Environmental Site Assessment (Phase I ESA), and a partial Phase II ESA evaluating soil and groundwater contamination were prepared for the LECEF site. The Phase II ESA found that the native soil contains residual pesticide contaminants from past agricultural practices. Please refer to the **Waste Management** section of this Final Staff Assessment for a complete discussion of the Phase II ESA findings and related recommendations.

GROUNDWATER

The proposed LECEF site lies above the Santa Clara Valley Groundwater Basin that extends from the Coyote Narrows at Metcalf Road to the San Francisco Bay. This basin is divided into three hydrogeologic units: the forebay, the upper aquifer and the lower aquifer. The upper or shallow aquifer is characterized by poorer quality water, with high salinity. The lower aquifer is confined and of general good quality making it the principal groundwater source of drinking water for the Santa Clara Valley. Regionally, groundwater flows to the north and west towards San Francisco Bay. Groundwater flows below the site are towards Coyote Creek.

Available groundwater information near the proposed project site indicates that shallow groundwater occurs at depths of 6.5 to 19 feet below ground surface. The project site is underlain by stiff clays, loose clayey silt and clayey sand, to depths of 5 to 20 feet. Below these materials are interbedded strata of very stiff silty clay and loose to dense silty sand and sandy gravel, to at least 30 feet. These sediments have relatively poor groundwater yield and quality, and are subject to saltwater intrusion. The shallow zone is separated from deeper aquifers by a blue clay aquitard, which extends to approximately 150 feet. Below this aquitard, groundwater is used as a supply throughout the Santa Clara Valley (LECEF, LLC. 2003). The Santa Clara Valley groundwater resources are generally in overdraft, meaning that recharge does not keep up with demand.

SURFACE WATER HYDROLOGY

Coyote Creek is the largest drainage basin in the Santa Clara Valley, collecting runoff from a 320 square mile watershed spanning portions of the Diablo Range, Santa Cruz Mountains and Santa Clara Valley. In its 80-mile length, Coyote Creek passes through two flood control reservoirs at the western base of the Diablo Range, and flows northwest through the City of San Jose, and discharges into San Francisco Bay. The stream channel has been modified for flood control purposes in limited reaches through the urbanized Santa Clara Valley. In 1997, a new overflow channel (Coyote Creek Flood Bypass) was built to divert floodwaters along the south side of Newby Island Landfill. Additionally, an enlarged and enhanced levee system was constructed along lower portions of Coyote Creek to improve flood conveyance capacity (LECEF 2001, AFC Section 8.14).

The southern edge of San Francisco Bay is located to the north of the site. As a result of land subsidence in the area caused by overdrafting the groundwater resources, salt water from the Bay travels up shallow creeks and streams. Coyote Creek water quality varies depending on the amount of fresh water flows from upland areas and tidal

conditions in the Bay. The creek's flow and water quality is also influenced by discharges from industrial, commercial and urban sources.

LECEF WATER SUPPLY

Recycled water is used for the vast majority of LECEF's water requirements and is delivered via an 18-inch, 1,500-foot pipeline from the San Jose/Santa Clara Water Pollution Control Plant (WPCP). Recycled water is disinfected, tertiary-treated waste water that has been treated to a level safe for release to the environment through a combination of biological, chemical, and filtration treatment. Potable water for personal needs is currently and will continue to be trucked to the site by local suppliers (no municipal potable supply is used). **Soil & Water Table 3** summarizes the proposed quantities of recycled water use and wastewater discharge to the WPCP associated with LECEF Phase 2. These projections, developed in cooperation with the City of San Jose Department of Environmental Services, Watershed Protection (the City), support revisions to the Recycled Water User Agreement between the City and applicant, as water demands will increase for LECEF Phase 2. The projections also account for several improvements that were identified under Phase 1 and are currently in-progress, for achieving higher in-plant recycled water use efficiency and reductions in wastewater discharge.

These improvements are highlighted as follows:

1. Rerouting the microfilter backwash to the cooling tower for reuse rather than discharging as wastewater;
2. Working with the equipment vendor to assure achievment of the design ratings for the LECEF wastewater treatment equipment;
3. Installing additional instrumentation and valving to better monitor and control the LECEF wastewater system.

During the October 22, 2004 Phase 1 Staff Assessment Workshop in San Jose, the project owner advised staff that rerouting of the microfilter backwash had been accomplished, and that the two other tasks were in-progress and scheduled to be completed during 2005 (LECEF, LLC. 2004d). These modifications, made for the operating Phase 1 facility will also assure greater efficiency for the proposed Phase 2 combined-cycle operations.

SOIL AND WATER Table 3
LECEF Phase 2 – Proposed Recycled Water Usage and Wastewater Discharge
Gallons per Minute (gpm) and Gallons per Day (gpd)

	Average Day		**Normal Peak Day**	
Component Stream	**gpm**	**gpd**	**gpm**	**gpd**
Water Losses to Air and Land:				
Cooling Tower Evaporation	582	838,080	1028	1,480,320
Combustion Turbine Evaporation*	134	192,960	195	280,800
Landscape Irrigation	2	2,880	2	2,880
Total Evap. Loss & Irrigation**	**718**	**1,033,920**	**1225**	**1,764,000**

Wastewater Streams:				
Micro Filter Backwash***	Recycled	Recycled	Recycled	Recycled
Blowdown Cooling Tower	144	207,360	255	367,200
Oil/Water Separator Effluent	2	2,880	2	2,880
Reverse Osmosis Reject Water	47	67,680	69	99,360
Sanitary Wastewater	1	1,440	1	1,440
Total Wastewater Discharge	**194**	**279,360**	**327**	**470,880**
Subtotal – Recycled Water Use	**912**	**1,313,280**	**1552**	**2,234,880**
Water Supply:				
Recycled Makeup Water	912	1,313,280	1552	2,234,880
Potable Water	1	1,440	1	1,440
Total Water Supply	**913**	**1,314,720**	**1553**	**2,236,320**

Sources: Tetzloff, Rick. 2004
*Combustion Turbine evaporation includes inlet cooling, emission control and power augmentation.
**Evaporative Loss & Irrigation is water consumed by the project.
Under the Revised Permit, microfilter backwash is being recycled to the Cooling Tower, rather than being discharged as wastewater.
***Micro Filter Backwash is recycled to the cooling tower.

Please note that the applicant has also estimated a "worst-case" peak day recycled water demand of 2,946,131 million gallons per day (mgd), compared to a "normal" peak day demand of 2,236,320 mgd shown in the table above. The difference in assumptions is as follows:

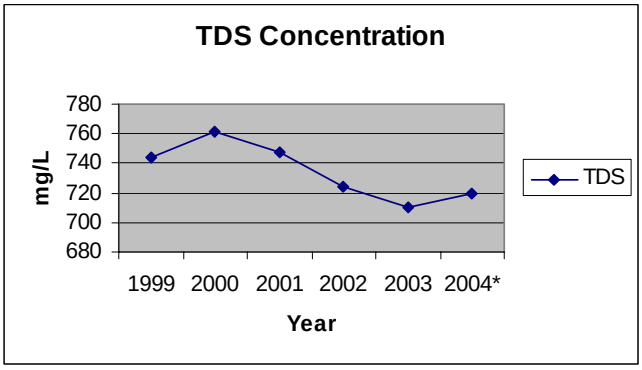
1. Normal Peak Day – The normal peak day assumes 7 hours duct firing and 10 hours without duct firing at an average ambient temperature of 81 °F, and 7 hours without duct firing at an average temperature of 61 °F.
2. Worst-case Peak Day – The worst-case assumes 24 hours duct firing at an average ambient temperature of 81 °F (Tetzloff, Rick. Calpine. 2004).

The corresponding quantity of wastewater discharge would also increase in comparing the "normal peak day" to the "worst case peak day", from 470,880 mgd to 614,656 mgd respectively.

The WPCP treats wastewater to California Code of Regulations Title 22 standards for unrestricted use for the SBWR program (disinfected tertiary recycled water). Approximately ten percent (10 mgd) of the water treated by WPCP is used to supply the various customers of the SBWR program and the balance (90 mgd) is discharged to the Bay. Although the WPCP has a rated treatment capacity of 167 mgd, its existing NPDES permit requires the WPCP to maintain discharges into San Francisco Bay to not exceed 120 mgd. Through the implementation of an influent (waste water entering the treatment facility) reduction program, the City of San Jose has successfully reduced flows into the WPCP so as to reduce its effluent from 120 mgd during 1999 to 100 mgd during 2003. Data shows that the recycled water produced by the WPCP also improved in quality between 1999 and 2003 (see **Soil and Water Figure 1**), as demonstrated by

TDS annual average concentrations declining from 744 mg/L to 710 mg/L. During the first part of 2004, recycled water increased slightly in TDS concentration.

SOIL AND WATER Figure 1
SBWR Program Recycled Water TDS Concentrations



The City of San Jose, as administrator for the South Bay Water Recycling Program, has established rules and regulations for the users of the program's recycled water, including requirements for the design and operation of facilities using recycled water. The applicant obtained a User Agreement for Recycled Water for Phase 1 on December 16, 2002, providing a quantity of 300 acre-feet/year (Customer Number SJ-000-4271). The User Agreement will need to be revised by the City to include the increases for the LECEF Phase 2 recycled water demands if the project is approved.
Soil and Water Table 4 provides water quality data for the SBWR Program's recycled water. The data is as provided in the SBWR Program's 2003 Report and is expressed in a range of minimum, average and maximum values for the year.

SOIL AND WATER Table 4
Recycled Water Quality for the SBWR Program - 2003 Report Data

Water Quality Parameter	Minimum Level	Yearly Average	Maximum Level
Alkalinity (CaCO3) mg/L	170	194	213
Ammonia (Nitrogen) mg/L	<0.1	<0.3	0.8
Bicarbonate (HCO3) mg/L	170	194	213
Biological Oxygen Demand mg/L	2,0	3.4	6.0
Conductivity, µmhos/cm	1102	1205	1282
Hardness (CaCO3) mg/L	223	244	261
Nitrate (Nitrogen) mg/L	5.8	8.0	10.0
Nitrite (Nitrogen) mg/L	<0.05	<0.08	0.2
Settleable Solids mg/L/hr	<0.1	<0.1	<0.1
Total Coliform Count CFU/100ml	< 1	< 1	5
Total Dissolved Solids mg/L	**648**	**710**	**758**
Total Fats, Oils & Grease mg/L	< 5	< 5	< 5
Total Suspended Solids mg/L	<1.0	<2.0	3.6
Turbidity NTU	0.5	0.9	1.7
Arsenic mg/L	< 0.0005	0.0009	0.0014
Boron mg/L	0.479	0.578	0.651
Cadmium mg/L	< 0.0005	< 0.0005	< 0.0005
Calcium mg/L	50.5	53.6	58.7
Chloride mg/L	154.0	181.0	193.0
Total Chromium mg/L	< 0.0005	< 0.0007	0.001
Copper mg/L	0.0016	0.0028	0.0048
Iron mg/L	0.050	0.091	0.120
Lead mg/L	< 0.001	< 0.001	0.001
Magnesium mg/L	28.3	31.2	36.1
Mercury µg/L	< 0.002	< 0.002	0.002
Nickel mg/L	0.005	0.0058	0.008
Phosphate mg/L	0.600	2.370	5.500
Potassium mg/L	14.800	15.800	18.200
Silicon mg/L	10.900	12.400	13.600
Silver µg/L	< 0.2	< 0.2	< 0.2
Sodium mg/L	150.0	158.8	172.0
Sulfate mg/L	89.0	102.0	111.0
Zinc mg/L	0.031	0.054	0.120
Dissolved Oxygen mg/L	5.2	6.9	8.3
Ortho Phosphate mg/L	< 1.0	< 1.5	3.4

Source: San Jose, 2003. http://www.ci.san-jose.ca.us/sbwr/Downloads/WQI2003.pdf

The most sensitive water quality parameter, affecting the SBWR Program's ability to more broadly market its recycled water product, is total dissolved solids (TDS). The effect of the LECEF's operation on the Program's recycled water TDS concentration, as attributed by the quality of the LECEF wastewater discharge, is considered in the following section.

PROCESS WASTEWATER

The City of San Jose regulates wastewater discharges to the San Jose/ Santa Clara Water Pollution Control Plant (WPCP) as conveyed via its sewer system (Municipal Code chapter 15.14, Ordinance No. 24800). Industrial wastewater dischargers such as

LECEF must obtain an Industrial Wastewater Discharge Permit to comply with the City's requirements. For Phase 1, the applicant submitted an application for this permit in September 2002 and is currently operating under an amended Industrial Wastewater Discharge Permit (No. SJ-488A, October 2003). For Phase 2, the Industrial Wastewater Discharge Permit will need to be revised to reflect the higher quantities of wastewater discharge from LECEF, and also to consider any adverse changes in the quality of wastewater.

As shown in **Soil and Water Table 3** which summarizes the LECEF Phase 2 proposed quantities of recycled water usage and wastewater discharge, the projected quantities of wastewater discharge under normal operating conditions range from 279,360 gpd to 470,880 gpd for average and peak conditions respectively. The applicant has also estimated a "worst-case" peak day wastewater discharge of 614,656 gpd. The difference in assumptions is as follows:

1. Normal Peak Day – The normal peak day assumes 7 hours duct firing and 10 hours without duct firing at an average ambient temperature of 81 °F, and 7 hours without duct firing at an average temperature of 61 °F.
2. Worst-case Peak Day – The worst-case assumes 24 hours duct firing at an average ambient temperature of 81 °F (Tetzloff, Rick. Calpine. 2004).

The process wastewater streams are attributable to cooling tower blowdown, effluent from the oil/water separator of the plant drain system, reject water from the reverse osmosis wastewater treatment process, and sanitary wastewater. Another waste stream from the micro filter wastewater treatment process, until recently, was discharged as wastewater to the WPCP. However, under LECEF Phase 1, the applicant has recently re-plumbed the micro filter backwash to allow recycling for use in the cooling tower. This effectively reduces the quantity of wastewater discharge by about 10 percent, as well as the recycled water makeup demands by about 2 percent, and will be continued for the Phase 2 operations.

STORM WATER

Characterized by relatively flat topography, the site elevation is 15 feet above mean sea level. The site has been graded to direct surface drainage at LECEF, predominately storm water, to perimeter ditches and underground culverts that convey the drainage to a sump located in the northeast corner of the site. Surface drainage is then discharged from the sump via a 1,000-foot pipeline into the high water channel of Coyote Creek east of the site. The pipeline crosses under existing flood control structures consisting of a levy/access road, the Coyote Creek Bypass (Overflow) Channel, and through the raised stream bank of Coyote Creek. The stream bank has been armored with rip-rap for erosion control. The project owner is currently working with the Santa Clara Valley Water District and federal agencies to move the discharge point approximately 250 feet from the high water channel to the main (low water) channel of the creek. Santa Clara Valley Water District (SCVWD) requires a Storm Water Outfall Construction Permit in accordance with District Ordinance No. 83-2 for the storm water outlet and discharge of flows into Coyote Creek, a designated floodway under SCVWD's jurisdiction (LECEF, LLC. 2003). The permit to complete the 250 foot extension of the outfall into the low

water (main) channel of Coyote Creek was granted on April 11, 2005 (SCVWD Permit No. 05411).

PHASE I SUMMARY

The most significant soil and water resource issues identified in the Phase 1 proceeding are summarized below.

Phase 1 Water Use

SOIL AND WATER Table 5 below summarizes the originally permitted water use and wastewater discharge rates associated with the LECEF as contained in the Recycled Water Use and Wastewater Discharge Permit applications filed by the project owner with the City.

SOIL AND WATER Table 5
LECEF Phase I – City Permitted & Revised Permit Water Usage and Discharge Gallons per Day (gpd)

	Average Day (gpd)		Peak Day (gpd)	
Component Stream	**Original Permit**	**Revised Permit**	**Original Permit**	**Revised Permit**
Water Losses to Air and Land:				
Cooling Tower Evaporation	51,892	23,000	64,761	137,152
Combustion Turbine Evaporation*	144,319	89,401	180,110	178,115
Landscape Irrigation	Not Included	3,600	Not Included	3,600
Total Evap. Loss & Irrigation**	**196,211**	**116,001**	**244,871**	**318,867**
Wastewater Streams:				
Micro Filter Backwash	9,626	0	12,014	0
Blowdown Cooling Tower	12,665	5,720	15,806	34,491
Oil/Water Separator Effluent	1,512	2,817	1,887	2,817
Reverse Osmosis Reject Water	48,132	29,902	60,069	60,033
Sanitary Wastewater	841	1,560	1,050	1,560
Total Wastewater Discharge	**72,776**	**39,999**	**90,826**	**98,901**
Subtotal – Water Use	**268,987**	**156,000**	**335,697**	**419,341**
Water Supply:				
Recycled Makeup Water	268,490	154,427	335,075	417,768
Potable Water	841	1,573	1,050	1,573
Total Water Supply	**269,331**	**156,000**	**336,125**	**419,341**

Sources: Tetzloff, Rick. 2004 and San Jose/Santa Clara Water Pollution Control Plant Wastewater Discharge Permit Application, dated 9/13/02 and San Jose/Santa Clara Water Pollution Control Plant Industrial Wastewater Discharge Permit No. SJ-488A, as amended 10/3/03.
*Combustion Turbine evaporation includes inlet cooling, emission control and power augmentation.
**Evaporative Loss & Irrigation is water consumed by the project.

Under the Revised Permit, microfilter backwash is being recycled to the Cooling Tower, rather than being discharged as wastewater.
While for the Original Permit condition the Water Use does not quite equal the Total Water Supply, this inconsistency is moot, as it is being superseded by a New Permit, which does balance.
All conditions assume 5 cycles of concentration in the cooling tower.

SOIL AND WATER Table 5 also summarizes updated water use and wastewater discharge rates as recently provided by the project owner to the City to support a revised permit application. The updated data supporting a revised permit application is based on actual LECEF performance data and reflects additional improvements for water efficiency in-progress and planned by the project owner.

The revisions to the Phase 1 recycled water supply permit result in a 42 percent decrease for the average day condition and a 25 percent increase for the peak day condition. The revisions to the wastewater discharge permit result in a 45 percent decrease for the average day condition and a 9 percent increase for the peak day condition.

SOIL AND WATER Table 6 shows the projected worst-case scenario for Phase 1 recycled water use and wastewater discharge as provided in this AFC during 2003 (03-AFC-2), and later updated in 2004. In comparing these values to **SOIL AND WATER Table 5**, it is important to recognize the differences in assumptions; projected differences between the permitted condition and worst-case (AFC) scenario are as follows:

1. Average Day – The permitted condition assumes eight hours operation at 59°F compared to the worst-case condition of 24 hours operation at 59°F.
2. Peak Day – The permitted condition assumes eight hours operation at 109°F and eight hours operation at 59°F compared to the worst-case scenario of 24 hours at 109°F (Tetzloff, Rick. Calpine. 2004).

SOIL AND WATER Table 6
AFC Defined & Revised Worst Case LECEF Water Usage and Discharge

Component Stream	Average Day (gpd)		Peak Day (gpd)	
	2003 AFC	2004 AFC Revision	2003 AFC	2004 AFC Revision
Total Evaporation Loss & Irrigation*	324,000	339,236	523,000	646,127
Total Wastewater Discharge	176,000	111,178	297,000	189,964
Total Water Demand	500,000	450,414	820,000	836,091

Sources: Tetzloff, Rick. 2004 and LECEF, LLC 2003. Please note that several values are provided for both peak and average water demand and wastewater discharge in the AFC. Staff used numbers found on page 8.15-11.
*Evaporative Loss & Irrigation is water consumed by the project.

Staff for the Energy Commission and the City Environmental Services Department, Watershed Protection, have expressed concern to the applicant that the actual Phase 1

performance to date had resulted in higher rates of recycled water use and wastewater discharge than originally estimated and permitted by the City. As a result of these discussions the project owner reviewed its plant performance with respect to recycled water use and wastewater discharge and has initiated the measures discussed in the previous section **LECEF WATER SUPPLY** (p. 4.9-6) that will more efficiently utilize water supply and minimize wastewater discharge.

Phase 1 Process Wastewater

LECEF Phase I produces wastewater through various processes including microfiltration backwash, cooling tower blowdown, reverse osmosis concentrate, process drains and sanitary wastewater. This wastewater is discharged to the WPCP as influent for treatment. The 18-inch, 2,000-foot wastewater pipeline interconnects with the City sewer main trunk line in Zanker Road. The LECEF wastewater is discharged in accordance with the City's Industrial Wastewater Discharge Permit.

The applicant submitted an original application to the City that specified LECEF would discharge an average of 72,776 gpd and a peak of 90,826 gpd to the City sewer system (see **SOIL AND WATER Table 5** above). The permit issued by the City, and required by the Energy Commission's original 2002 Decision (Condition of Certification **Soil & Water-8**), also included these volumes (Permit No. SJ-488A, issued October 3, 2003). The self-monitoring program, during the first two years of operation, showed that LECEF discharges regulated constituents below the specified concentration limits, but discharges more wastewater than specified in the permit for peak conditions (LECEF, LLC 2004b; LECEF, LLC 2004c). As a result of the completed Phase I Recertification process, the project owner revised its estimates of wastewater discharge to an average of 39,999 gpd and a peak of 98,901 gpd. The City indicated that it will revise the Wastewater Discharge Permit accordingly (Shipes, R. 2004d)

The estimated quality of the wastewater discharge from LECEF also changed since the project was originally approved. Specifically, and according to the 2003 AFC data, the concentrations for silicon and total dissolved solids (TDS, analogous to salinity) in the wastewater appeared about three and two times higher respectively than originally estimated in 2001, although the estimates of the source water quality had not changed (see **SOIL AND WATER Table 7**). The project owner provided an updated projection in 2004 as a revision to the 2003 AFC data, and now projects an increase in silicon and TDS on the order of 3 and 1.5 times higher respectively than originally projected in 2001. While neither of these projections violate specific wastewater quality discharge criteria according to the City's permit, the concern is for LECEF's contribution to an incremental increase in TDS to the quality of the City's recycled water product overall. Staff's original analysis identified that LECEF's wastewater had the potential to adversely impact the quality of the recycled water produced for the SBWR program by increasing concentration of certain constituents at the WPCP, specifically TDS.

SOIL AND WATER Table 7
LECEF Effluent Discharge Concentrations

Constituent	Source Water	2001	2003	2004
Max Makeup Flow (gpm)		207	207	290
Silicon (mg/L)	11.7	31.5	107	93.5
TDS (mg/L)	869	2,232	4,328	3,394

Source: LECEF, LLC 2001 Tables 8.14-1 and 8.14-2; LECEF, LLC 2003 Tables 8.15-2 and 8.15-3, and Tetzloff, Rick. 2004; All silicon assumed to be in SiO_2 form.

Staff requested information from the City Environmental Services Department, Watershed Protection, regarding the severity of the increased impacts on the recycled water product (Shipes, R. 2004b). Mr. Shipes responded to the Energy Commission with a letter dated October 15, 2004, in which the City observed that the effect of the LECEF wastewater discharge to the City's recycled water product results in an increase in TDS of about 1.5 percent, from about 719 mg/l to 730 mg/l under peak conditions (revised permit conditions). The City concluded that this incremental effect is not a significant impact to its recycled water quality or marketability at this time. (Shipes, R. 2004d)

Phase 1 Stormwater and Surface Runoff

Of the 34-acre total LECEF site, 21 acres have been developed for Phase I. The LECEF has paved areas for roads, parking lots and some storage areas, whereas the majority of the rest of the site is covered with gravel. As mentioned above, a system of drains, ditches and other drainage features collect surface runoff that is then pumped to the high flow channel of nearby Coyote Creek. A construction-related Notice of Intent (NOI) was submitted for coverage under the RWQCB's general NPDES permit. This construction-related NOI was terminated in March 2004 and the project is now covered under the RWQCB's general stormwater permit for Industrial Activities.

After inspecting the site on March 24, 2004 and evaluating the drainage system, staff was concerned that the current system is not adequately protecting surface runoff from contamination. Staff recommended that additional permanent Best Management Practices (BMPs) be implemented to ensure contaminants from the drainage areas are removed prior to discharge of the runoff to Coyote Creek. Such BMPs could include more frequent cleaning of catch basins, increased inspections and sampling, and directing site drainage from contaminant contact areas (roadways, parking, and uncovered storage areas) to an oil-water separator. An improvement to the BMPs that is already in-place relates to existing perimeter ditches which serve as the initial and primary storm water collection system. These now have established grass that serves to skim the limited oils that collect and drain from the paved and gravel-surfaced non-contact areas of the facility. The collected storm water runoff is then conveyed via underground culverts to a collection sump and then to the storm water outfall line (LECEF, LLC. 2004d). The existing Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity is being updated to address additional BMP's or structural changes as necessary, and will be subject to CPM approval.

ANALYSIS OF PHASE 2 RELATED IMPACTS

PHASE 2 PROPOSED MODIFICATIONS

Phase 2 will increase the current 180 MW generating capacity of LECEF by 140 MW to 320 MW by adding HRSG tubing, associated equipment and piping, and a steam turbine. To cool the steam and additional equipment, the applicant proposes a new six-cell cooling tower using recycled water. The activities defined as part of the Phase 2 expansion of the LECEF generating capacity will predominately affect recycled water demand and wastewater discharge to the WPCP, increasing them on the order of three-fold. In addition, the discharge of storm water will be moved from the Coyote Creek high-flow channel to the low-flow channel.

SOIL

Major excavation and trenching will occur in the switchyard, along on-site roadways, in the southwest corner of the site and adjacent to the combustion turbines near the chiller system. Ground disturbance during construction and operation of LECEF Phase 2 can increase both wind and water-related erosion and off-site sedimentation potential for soil found at the site. As part of construction and operation, various process chemicals, petroleum products, and other materials will be required. These materials, if not handled or stored properly, could contaminate soil and water resources. Exposed contaminated soil can increase health risks to construction and operation staff as well as potentially contaminate stormwater runoff/drainage.

During Phase 1 activities, the applicant developed an Erosion and Sediment Control Plan (ESCP) as well as both a construction-related and operation-related SWPPP. For Phase 2 activities, the applicant proposes to make minor changes to the Phase 1 plans and implement many of the same BMPs. No major modifications to the existing site drainage facilities are proposed. Based on a March 24, 2004 inspection of the LECEF, staff became concerned for the adequacy of BMPs to protect surface drainage and stormwater runoff from on-site contaminants and has recommended making improvements to the existing system. These drainage improvements are discussed in this Phase 2 Storm Water Section as well as in the Phase 1 analysis. Site-specific BMPs for erosion control will be identified and illustrated in a revised ESCP as required under Condition of Certification **SOIL & WATER-1**. Combined with the Storm Water Pollution Prevention Plan (SWPPP) for construction (Condition of Certification **SOIL & WATER-2**), these documents will demonstrate plans for proper handling and containment of chemicals, scheduling for placement and removal of BMPs in coordination with construction activities, and monitoring during construction, among other erosion prevention measures.

The **Waste Management** analysis concurs that the applicant should develop and implement a Soil Management Plan for the construction of Phase 2. Appropriate measures recommended to avoid or remediate contaminated soil and groundwater that may be encountered during construction should be incorporated into the ESCP developed for Phase 2 as well as construction and operation SWPPPs.

Staff recommends Conditions of Certification **SOIL & WATER 1, 2** and **3** to ensure that the LECEF Phase 2 develops and implements plans to avoid contamination of surface runoff, minimizes erosion and offsite sedimentation, meets drainage and surface runoff requirements specified by City of San Jose and SCVWD, and complies with the General NPDES program requirements.

GROUNDWATER

Groundwater is not used for either LECEF Phase 1 or 2. Surface drainage is directed to Coyote Creek rather than a retention pond and process effluent is directed to the WPCP. As part of the Phase 1 construction, the applicant was required to remove and close six wells located on the land purchased by the applicant for the LECEF development (LECEF, LLC 2003, p. 8.15-5). Staff had received confirmation during the initial LECEF construction that five of six wells had been removed and closed (see Condition of Certification **SOIL & WATER 5**). The applicant has since provided confirmation that Well #6 has been closed (LECEF, LLC 2005). Measures to be implemented in the event that shallow groundwater is encountered during trenching and/or excavation (de-watering) for Phase 2 will be addressed in the plans developed for Conditions of Certification **SOIL & WATER 1, 2** and **3.** Staff believes that by implementing the ESCP and SWPPP for construction, LECEF Phase 2 will not adversely impact groundwater resources.

SURFACE WATER HYDROLOGY

Drainage at the LECEF site has been designed to prevent flooding of permanent facilities and roads, both on-site and off-site. LECEF surface runoff/drainage is currently discharged to the high flow channel of Coyote Creek and eventually will be discharged approximately 250 feet further from the plant when the outfall is moved to the low flow channel. The applicant expects to complete the relocation of the outfall no later than the summer of 2005. The SCVWD has issued a permit for the completion of the outfall line to the main low-water channel of Coyote Creek (SCVWD Permit No. 05411, April 11, 2005).

Subsequent to recent modifications to flood control features by the SCVWD and U.S. Army Corps of Engineers, a Letter of map Revision by the Federal Emergency Management Agency documents the site is outside of the 100-year flood plain. Neither the construction of LECEF Phase 2 nor its storm water runoff will exacerbate flooding conditions in Coyote Creek.

WATER SUPPLY

The Phase 2 expansion of the LECEF with the addition of a 140 MW steam turbine will increase recycled water demand for both average and peak day conditions on the order of approximately three-fold compared to Phase 1. Staff and City of San Jose Environmental Services Department, Watershed Protection, noted earlier in this proceeding that the 2003 AFC provided inconsistent projections for the quantities of recycled water use. The projections also differed from the Applicant's initially requested Phase 2 will-serve quantities in its November 25, 2003 submittal to the City. The applicant has since updated its projections and clarified the basis for the differing demand values as being primarily a result of comparing scenarios that are normal operations vs. worst-case, and in adopting recycled water efficiency measures under

Phase 1 that will also be effective in Phase 2. The projections are as presented earlier in **Soil & Water Table 3**.

In its September 28, 2004 letter to the City, the applicant revised projected recycled water quantities for Phase 2, and requested the City provide a letter indicating its ability to serve. The initial approval by the City to serve recycled water for LECEF Phase 2 was indicated in a letter dated December 10, 2003 from Mr. Randolph Shipes (LECEF, LLC 2003, Appendix 7-A). Since receiving the applicant's updated recycled water projections for LECEF Phase 2, Mr. Shipes has indicated to the Energy Commission in a letter dated October 15, 2004, that the City anticipates being able to accommodate the amended request for recycled water supply (Shipes, R. 2004d).

A comparison of the most up-to-date projected water demands for both Phases 1 and 2, showing an approximate three-fold increase, is shown in **Soil and Water Table 8**.

SOIL AND WATER Table 8
Comparison of Recycled Water Demands for LECEF Phases 1 and 2

	Phase 1 (gpd)		**Phase 2 (gpd)**	
	average	**peak**	**average**	**peak**
Recycled Water Demand	450,414	836,091	1,313,292	2,946,131

Source: Tetzloff, Rick. 2004
The estimates are based on achieving 5 cycles of concentration in the cooling towers.

Construction and operation of Phase 2 will rely on recycled water to meet process demand. Use of recycled water for the Phase 2 expansion is consistent with statutory requirements and state policies, avoids the use of groundwater resources already affected by overdraft (fresh water resources) and will reduce WPCP flows to the Bay (approximately 60 percent of water used by LECEF will be consumed).

Staff believes the LECEF Phase 2 recycled water demands will not have any adverse effect on the total quantity of supply available from the City, and in fact, will reduce the discharge of treated wastewater to San Francisco Bay. Current total customer demand for the City's recycled water product is approximately 10 million gallons per day (mgd), or 10 percent of the WPCP's average dry weather treated effluent flow of 100 mgd. Primary users of the recycled water currently are agricultural and irrigation customers. The LECEF Phase 2 peak recycled water demand of about three mgd will not have a detrimental effect on the quantity of water available to other existing or prospective customers under the SBWR program. To meet the increase in demand that is required to operate Phase 2, the WPCP can supply LECEF without additional infrastructure. The water supply pipeline from the WPCP to LECEF constructed as part of Phase 1 was sized for both phases, and no additional pipelines are required.

The City of San Jose, as administrator for the South Bay Water Recycling (SBWR) Program, has established rules and regulations for the users of the program's recycled water, including requirements for the design and operation of facilities using recycled water. The applicant obtained a User Agreement for Recycled Water for LECEF Phase 1 on December 16, 2002 for an annual supply of 300 acre-feet/year (Customer Number SJ-000-4271). It is expected the City will revise the User Agreement for Recycled Water

to serve LECEF Phase II to include volumes of recycled water consistent with meeting the projected average and peak demands.

LECEF's use of potable water averaging about one gpm is minimal and is not changing with the Phase 2 expansion. Therefore, Phase 2 will not have any adverse impacts on potable water supplies.

PROCESS WASTEWATER

Operation of LECEF Phase 2 will require a revision by the City Environmental Services Department, Watershed Protection, to the LECEF Industrial Wastewater Discharge Permit, as specified under Condition of Certification **Soil & Water-8**. The revised permit will need to consider both increases above Phase 1 in the average and peak day wastewater discharges, as well as any adverse effects that may be caused due to the quality of the Phase 2 wastewater. The applicant submitted an original will–serve request to the City in its letter dated November 25, 2003 proposing the WPCP receive LECEF Phase 2 average and peak day wastewater discharges of 323,788 gpd and 535,948 gpd respectively. After considering the effects of water efficiency measures being implemented under Phase 1, primarily attributable to the recycling of micro filter backwash to the cooling tower (which reduces the discharge by about 10 percent), the applicant has reduced its average day estimated quantity of wastewater from 323,788 gpd to 279,829 gpd. The applicant also updated its estimate of the peak day wastewater discharge quantity, and chose to increase it from 535,948 gpd to 614,656 gpd. The increase for peak day wastewater discharge considers the combined effects of recycling micro filter backwash (a reduction), in addition to assuming more extreme operating conditions (an increase), which results in an overall net increase in the peak day estimate. In its letter dated September 28, 2004, the applicant requested the City to accept LECEF Phase 2 wastewater discharge rates for average and peak days of 279,829 gpd and 614,656 gpd respectively.

In addition to the discharge rates, the Industrial Wastewater Discharge Permit also imposes limits for various constituents and, as part of the self-monitoring program, directs the project owner to perform periodic sampling for a subset of the regulated constituents in the discharge. The estimated quality of the wastewater discharge from LECEF has changed since the project was originally approved. Comparing the 2001 and 2003 AFC data, the average concentrations for silicon and total dissolved solids (TDS, analogous to salinity) in the wastewater appeared about three and two times higher respectively than originally estimated in 2001, although the estimates of the source water quality have not changed (see SOIL and WATER Figure1. The project owner then provided an updated projection in 2004 as a revision to the 2003 AFC data, and now projects an average increase in silicon and TDS on the order of 3 and 1.5 times higher respectively than original projections of 2001. While neither of these projections violate specific wastewater quality discharge criteria according to the City's permit, the concern is for LECEF's contribution to an incremental increase in TDS affecting the quality of the City's recycled water product and its acceptability for use by other customers overall. Staff's original analysis of the 2001 AFC identified LECEF's wastewater had the potential to adversely impact the quality of the recycled water produced for the SBWR program by increasing the concentration of TDS at the WPCP.

Soil and Water Table 7 summarizes the changes projected by the applicant in concentration of silicon and TDS for the LECEF wastewater discharged to the WPCP.

Based upon information available at the time of the original proceeding, staff recommended, with the City Environmental Services Department's concurrence, that mitigation of these impacts be addressed through a Salinity Control Program being developed by the City of San Jose. This position was similar to that taken by staff in other projects proposed in the San Jose area (Metcalf Energy Center and Pico Power Combined Cycle). However, over the last two years, efforts to develop the Salinity Control Program have progressed slowly. As a result, water quality degradation caused by LECEF to the SBWR recycled water product has not been mitigated. Mr. Randolph Shipes – Deputy Director, Environmental Services with the City of San Jose, informed Energy Commission staff that it may be ten years before a centralized salinity control system is in place (Shipes, R. 2004a). Staff then became concerned that it could no longer rely on the Salinity Control Program to mitigate any adverse impacts caused by the LECEF wastewater to the SBWR recycled water product.

Avoiding impacts to the SBWR recycled water product becomes particularly important when considering the potential future uses of recycled water to meet San Jose regional water demand. To accommodate growth throughout the region, the City, through the Water Task Force, is reviewing options to augment water supplies and expand use of current resources. One alternative water supply option to augment current supplies is recycled water. For example, a new community is being planned in the Coyote Valley of San Jose near the Metcalf Energy Center. This community is projected to consist of employment opportunities of up to 50,000 jobs, 25,000 homes, and 80,000 residents. At present, estimates indicate that local fresh water sustainable yield is limited to approximately 7,000 AF/Y, matching current average consumption in the area. The new community is expected to need 16,000 - 20,000 AF/Y (this does not include Metcalf Energy Center's demand).

To meet the water supply shortfall for this new development, recycled water would have to be advance treated recycled water (beyond Title 22 standards) to reduce TDS concentrations and other contaminants. Building a system capable of improving the quality of the recycled water (microfiltration, reverse osmosis, and ultraviolet treatment) is expensive. Degradation of the recycled water by other users will only increase costs to the City to achieve higher quality recycled water for expanded use (Shipes, R. 2004c). The City had indicated effluent that will degrade the overall recycled water product is unacceptable (Shipes, R. 2004b).

Staff requested information from the City regarding the severity of the increased impacts on the recycled water product (Shipes 2004b). Mr. Shipes responded to the Energy Commission with a letter dated October 15, 2004, which concludes that the effect of the LECEF wastewater discharge to the City's recycled water product results in increases in TDS as follows:

1. Normal peak day – An increase of about 1.5 percent, from about 719 mg/l to 730 mg/l;
2. Worst-case peak day - An increase of about 2.1 percent, from about 719 mg/l to 734 mg/l;

The City concluded that this incremental increase in TDS concentration is not a significant impact to its recycled water quality or marketability at this time. The City has also indicated it will revise the Industrial Wastewater Discharge Permit according to the applicant's proposed wastewater discharge rates for average and peak days (Shipes, R. 2004d).

STORM WATER

LECEF originally incorporated a temporary storm water outfall to the high flow channel of Coyote Creek. The Energy Commission's July 2, 2002 Decision included conditions, including Condition of Certification **Soil & Water-3,** that addressed the compliance of LECEF's temporary and permanent outfall with federal, state and local requirements. The applicant obtained a permit from the Santa Clara Valley Water District for the temporary stormwater outfall in the high flow channel of Coyote Creek (issued July 30, 2002, Permit No. 02464). Other permits obtained for this high flow channel outfall included a conditional waiver of Waste Discharge Requirements, dated July 26, 2002, from the San Francisco Bay Regional Water Quality Control Board (RWQCB); a Section 1601 Lake and Streambed Alteration Agreement (R3-2002-0037) issued by the Department of Fish and Game; and a permit from the Santa Clara Valley Water District for the outfall construction into the high flow channel (July 30, 2002 Permit No. 02464).

As was intended for Phase 2 during the original proceeding, the outfall is to be relocated from the high flow channel to the left bank of the low flow channel in Coyote Creek. As a result, these permits and agreements will either need to be modified or re-issued. The project owner has already obtained most of the permits for the permanent outfall as follows: 1) Water Quality Certification from the SFBRWQCB (3-1-04); 2) Section 1601 Lake and Streambed Alteration Permit from the California Department of Fish and Game (CDFG – 10-29-03); 3) Authorization from the Army Corps of Engineers for use of Nationwide Permits Nos. 7 – Outfall Structures and Maintenance, and 33 – Temporary Construction Access and Dewatering pursuant to Section 404 of the Clean Water Act; and Permit for Stormwater Outfall Construction applicable to the permanent outfall from SCVWD in compliance with Condition of Certification **Soil & Water-4**. The SCVWD issued the permit to construct the final reach of the outfall on April 11, 2005 (SCVWD Permit Number 0511). In addition, the applicant will need to request an extension of time from CDFG for the Section 1601 Permit, which expired December 31, 2004. The 1601 Permit extension is a common request of applicants and will very likely be approved. Once all permits are finalized, but prior to the start of construction for the permanent low flow channel outfall, the project owner will need to submit the recently acquired SCVWD Permit for Stormwater Outfall Construction to the Energy Commission Compliance Project Manager (CPM) (see Condition of Certification **Soil & Water-4**).

The criteria SCVWD established during the original proceeding for accepting the runoff volume from the U.S. Dataport (USD) development including LECEF (both Phases 1 and 2), was to demonstrate that the USD discharge rate into Coyote Creek would not exceed the rate of natural drainage as attributable to the USD area before development. The USD area naturally drains in two directions, a portion to the northeast into Coyote Creek, and a portion towards the northwest along Zanker Road. Of the USD area of 174 acres total, about 58 acres drains naturally into Coyote Creek and the balance along

Zanker Road. SCVWD has specified that the rate of storm water discharge from USD into Coyote Creek is not to exceed the rate calculated under a 10-year 24-hour design storm. The applicant has estimated that for 58 acres under this criterion, the discharge rate would be 64 cubic feet per second (cfs). Under LECEF Phase 1, which occupies a 34-acre site, the applicant limited its discharge of storm water to a maximum of 33 cfs. For LECEF Phase 2, which will occupy the same site area, the applicant proposes to not exceed the existing discharge capacity of 33 cfs.

For Phase 2, the incremental change in area producing storm water runoff will affect an area of approximately 32,000 square feet (< 1 acre), currently surfaced with gravel as part of Phase 1. While storm water runoff will slightly decrease for less than 1 acre affected by Phase 2, the balance of runoff will remain the same for approximately 33 acres of the total 34-acre site. Although Phase 2 will result in less than a 1-acre portion of the project site increasing in impervious surfacing for equipment foundations and paving, the expected net increase in runoff is being more than offset by retention of precipitation within the cooling tower and transformer secondary containment. The precipitation occurring over the cooling tower will be effectively recycled for use in the cooling tower, and will not runoff from the site. The precipitation occurring over the transformer containment will be directed to the process drains and will become a wastewater stream to the WPCP, and also will not runoff from the site. Therefore as a whole, the storm water runoff for the 34-acre LECEF site will slightly decrease as a result of the Phase 2 development and will not exceed the existing maximum rate of discharge of 33 cfs. (LECEF, LLC 2003, Appendix 7).

The design and operation of the LECEF storm water system is to prevent conveyance or discharge of any contaminants such as debris, oil or other petroleum products to Coyote Creek. Staff conducted a site visit of LECEF on March 24, 2004. During inspection of drainage facilities, staff noted that flows from the vast majority of the site are directed to perimeter ditches and catch basins. These areas include “contact” areas where pollutants can usually be found such as in parking areas, roads and uncovered equipment storage areas. Only flows from a small portion of the site, areas where the turbines are housed, are directed to the oil-water separator. After inspecting one of the catch basins that directs water from these ditches to the storm water sump, staff noted the presence of an oily scum on the surface of the water in the catch basin. Staff then inspected the temporary outfall in the high channel area of Coyote Creek. Staff noted that the concrete pad at the temporary outfall appeared clean although some staining could be seen at the high water mark on the concrete. As of March 2004, the swales were lined with filter fabric and contained heavy deposits of silt and sediments, but little vegetation. Since then, the perimeter ditches have established grass and will serve to better skim the limited oils that collect and drain from the paved and gravel-surfaced non-contact areas of the facility (LECEF, LLC. 2004d).

Staff has recommended the catch basins be cleaned, and periodic inspections/sampling be done to ensure contaminants from the drainage areas are removed prior to the discharge of the drainage to the sump/lift station that lifts the drainage to Coyote Creek. If the grass-lined ditches are not successful in removing traces of oils during stormwater runoff events, staff also recommends that modifications to the site drainage occur so that flows from contact areas are also directed to an oil-water separator. The Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity must be updated to

address additional BMP's or structural changes (e.g. rerouting the surface flows to an oil-water separator if needed) that eliminate the contamination of drainage discharged to the Creek (see Condition of Certification **SOIL & WATER-3**). Subject to complying with Conditions of Certification **SOIL & WATER 1 through 4**, staff believes that the applicant's plans for managing storm water will be accomplished in compliance with LORS, including SCVWD's criterion for discharge into Coyote Creek, and with respect to preventing contaminants from being discharged via storm water from the LECEF into Coyote Creek.

CUMULATIVE IMPACTS

Water Supply

Staff has not identified any cumulative development projects, including the Metcalf Energy Center and the planned Coyote Valley community, that would diminish the supply of disinfected tertiary recycled water supply to LECEF. Conversely, development of the LECEF combined-cycle project will not have a negative impact on availability of disinfected tertiary recycled water for any existing or prospective customers of the SBWR Program. The proposed use of reclaimed water would be consistent with California Water Code requirements, State and Local Policies, including SWRCB Resolution 75-58 and CEC IEPR 2003, encouraging conservation of potable water supplies.

Wastewater

The wastewater streams from the LECEF include cooling tower and process blowdown, sanitary wastewater, plant drainage and reject streams from wastewater treatment. The combined wastewater will be monitored to assure that it complies with the City's discharge limits in accordance with the Industrial Wastewater Discharge Permit. The City is familiar with the other electric generation projects proposed in the San Jose area, including Metcalf Energy Center and Pico Power Combined Cycle, and other industrial projects contributing to the quality of its wastewater. The wastewater is tertiary treated at the WPCP and a portion is marketed as disinfected tertiary recycled water with the balance discharged to San Francisco Bay. With these contributing factors in mind, the City has concluded that the incremental increase in TDS concentration attributable to LECEF is not a significant impact to its recycled water quality or marketability at this time. The City has also indicated it will revise the Industrial Wastewater Discharge Permit according to the applicant's proposed Phase 2 wastewater discharge rates for average and peak days (Shipes, R. 2004d).

Storm Water

The LECEF storm water discharge will not exacerbate flooding conditions in Coyote Creek, where all of the 34-acre site will drain. The discharge of up to 33 cfs is consistent with the SCVWD's criterion for the rate and location of discharge. In addition, the applicant is addressing water quality concerns raised by staff in implementing BMPs in accordance with its SWPPP for industrial activity. The proposed mitigation measures and the conditions of certification will reduce the impacts to less than significant.

LIMITATION OF ANALYSIS

Staff's analysis relies on estimates and information provided by the applicant regarding the construction and operation of Phase 2. Determination of potential impacts and recommended mitigation are the direct result of Phase 2 related information and estimates. Review of Phase 1-related estimates, permits and operational data has shown that actual operation differed from original projections for quantities of recycled water use and wastewater discharge. As a result, staff recommends that the applicant continue to monitor the water consumption and wastewater discharge of LECEF and report these results periodically to the Energy Commission (see Condition of Certification **SOIL&WATER-6**). Any changes in recycled water use and wastewater discharge from those volumes expected with operation of Phase 2, can then be analyzed to ensure that any adverse impacts are properly assessed and mitigated.

FACILITY CLOSURE

The LECEF is expected to operate for a minimum of 30 years. Closure options range from "mothballing," with the intent of a restart at some time, to the removal of all equipment and facilities.

The decommissioning plan will be submitted to the Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans will be required. The plan will address all concerns regarding impacts to soil and water resources at that time.

COMPLIANCE WITH LORS

The project as proposed, will comply with LORS provided the recommended Conditions of Certification are adopted and implemented.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS

The primary issues identified by staff in this Phase 2 analysis considers the efficient use of recycled water, effects of the LECEF wastewater discharge on the overall quality of recycled water in the South Bay Water Recycling (SBWR) Program, and the quantity/quality of storm water discharged into Coyote Creek. Staff believes the applicant has worked diligently with the City of San Jose and Santa Clara Valley Water District to resolve these issues and comply with related permits, including providing updated projections of recycled water demands and quantity/quality estimates of wastewater to be discharged to the San Jose/Santa Clara Water Pollution Control Plant (WPCP). Where the potential for impacts is identified, staff has proposed mitigation measures to reduce the significance of the impact and, as appropriate, has recommended revisions to the original conditions of certification. Staff concludes that

there will not be any significant adverse impacts to soil and water resources as a result of the proposed LECEF Phase 2 Project.

PROPOSED CONDITIONS OF CERTIFICATION

Changes and Modifications to Conditions of Certification

Staff recommends several minor edits to the original conditions for construction and operation of LECEF Phase 2. The minor edits shown are generally consistent with those recommended for LECEF Recertification contained in Phase 1 Final Staff Assessment. with minor additions addressing the Phase 2 project. Some of the original conditions address the construction of LECEF and have been satisfied. Others need to be modified if the Phase 2 project is approved to reflect changes since the original LECEF Decision of July 2, 2002, and consistent with the March 16, 2005 Energy Commission Decision to recertify the LECEF simple-cycle power plant (CEC, 2005

Minor changes to Condition of Certification **SOIL & WATER-3** Verification are recommended. Modification to permits and plans required as part of relocating the storm water outfall should be submitted similar to those required for the temporary outfall. The project owner has submitted all permits to the CPM for the permanent outfall except for the SCVWD Stormwater Outfall Construction Permit (acquired on April 11, 2005) and the CDFG approval of an extension of time for the 1601 Permit which is still pending. Improvements to the on-site surface drainage system can be made through the current NPDES permit for Industrial Activities, which are to be documented in the revised SWPPP for Industrial Activity. Staff will want to review and approve the revised SWPPP for Industrial Activity that comprehensively manages storm water for the entire LECEF project including Phase 2. Condition of Certification **SOIL & WATER 5**, requiring confirmation of closure/destruction of the on-site water well #6 has been provided, and this condition is now satisfied. It is presented in strikethrough format in this FSA to insure consistent numbering with the LECEF Phase 1 recertification.

Minor changes have been made to Conditions of Certification **SOIL & WATER-1, 2, 3**, and **10** since the original Staff Assessment in 2002. The Army Corps of Engineers has revised its initial position and specified that the LECEF will need to use Nationwide Permits Numbers 7 and 33, rather than 3 and 7. These permits apply as follows: No. 7 – Outfall Structures and Maintenance; and No. 33 – Temporary Construction Access and Dewatering; and are pursuant to Section 404 of the Clean Water Act. Modification to permits and plans required as part of relocating the storm water outfall into the Coyote Creek low flow channel can be made without otherwise altering the condition. Since the Phase 1 simple-cycle project has been relicensed the underline/~~strikethrough~~ changes reflect the slight differences from the Energy Commission Decision.

The following conditions have been developed for the project:

SOIL & WATER-1: Prior to beginning any site mobilization activities, the project owner shall obtain staff approval of a final Construction Erosion and Sediment Control Plan (ESCP). The Construction ESCP shall include and be consistent with the standards normally required in the City of San Jose's Grading and

Excavation Permit, for all project elements. The final plan shall be submitted for Compliance Project Manager's (CPM's) approval, and for review and comment by the City of San Jose, and shall include provisions for containing and treating any contaminated soil or groundwater. The final plan will also include changes as appropriate, incorporating the final design of the project.

Verification: The Phase 2 ESCP shall be submitted to the CPM for review and approval and to the City of San Jose for review and comments at least 60 days prior to start of any site mobilization activities. The CPM must approve the final ESCP prior to the initiation of any site mobilization activities.

SOIL & WATER-2: The project owner shall submit a Notice of Intent for construction under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity to the State Water Resources Control Board (SWRCB), and obtain CPM approval of the related Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity associated with Phase 2. The SWPPP will include final construction drainage design and specify Best Management Practices (BMPs) for all on and off-site LECEF project facilities. This includes final site drainage plans and locations of BMPs.

Verification: At least 60 days prior to the start of any site mobilization activities, the Phase 2 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 SWRCB, shall be submitted to the CPM. Approval of the final SWPPP plan by the CPM must be received prior to initiation of any site mobilization activities.

SOIL & WATER-3: The project owner shall submit the following to the CPM as appropriate in association with obtaining approval for construction and operation of a storm water outfall into Coyote Creek:

1. If through the permitting process, Nationwide Permits 7 and 33 are not required under **SOIL & WATER-10** for construction of the storm water outfall in Coyote Creek, then the project owner shall submit an Application for 401 Water Quality Certification and/or Waiver of Waste Discharge Requirements to the San Francisco Bay Regional Water Quality Control Board (RWQCB) to obtain a Conditional Waiver of Waste Discharge Requirements;
2. Based on a design that will only discharge storm water from non-process areas for operation of the storm water outfall into Coyote Creek, the project owner shall submit a Notice of Intent and acceptance from the State Water Resources Control Board (SWRCB) for operating under the General NPDES Permit for Discharge of Storm Water Associated with Industrial Activity.
3. For operation of the storm water outfall into Coyote Creek, the project owner shall obtain CPM approval of the related Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity. The SWPPP will include final operating drainage design and specify BMPs and monitoring requirements for the entire LECEF project facilities including Phase 2. This includes final site drainage plans and locations of BMPs.

Verification: The project owner shall submit the following to the CPM, as appropriate, in association with obtaining approval for construction and operation of a stormwater outfall into Coyote Creek:

1) At least 30 days prior to construction of the storm water outfall in Coyote Creek, and if through the permitting process a Conditional Waiver of Waste Discharge Requirements is required, a Conditional Waiver of Waste Discharge Requirements shall be submitted to the CPM. (Please note that if the RWQCB determines a Conditional Waiver of Waste Discharge Requirements is necessary, the Application for 401 Water Quality Certification and/or Waiver of Waste Discharge Requirements must be filed at least 120 days prior to expected approval by the RWQCB.)

2) At least 30 days prior to the start of project operation, evidence of acceptance by the SWRCB of the Notice of Intent for operating under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity shall be submitted to the CPM.

3) At least 30 days prior to construction of the permanent outfall into Coyote Creek, the project owner shall submit to the CPM for approval a revised SWPPP for Industrial Activity for the entire LECEF project including Phase 2. Approval of the revised plan by the CPM must be obtained prior to permanent outfall construction. Installation or modification of BMPs as needed to ensure no contaminants are discharged to Coyote Creek, must be completed prior to permanent outfall operation.

~~**SOIL & WATER-4:** The project owner shall provide the CPM with all information/data necessary to satisfy the requirements of the Storm Water Discharge Outfall Construction Permit for construction of a storm water outlet, and to discharge flows into Coyote Creek, consistent with the requirements of Santa Clara Valley Water District's (SCVWD's) Ordinance No. 83-2. The data shall include stormwater runoff projections based on using HEC1 modeling techniques as requested by SCVWD.~~

~~**Verification:** At least 30 days prior to the start of construction on the permanent outfall in Coyote Creek, the project owner shall submit all elements required for a Storm Water Discharge Outfall Construction Permit to the CPM for review and approval and to the SCVWD for review and comments.~~

Staff has received a copy of the required Storm Water Outfall Construction Permit, Number 05411, dated April 11, 2005, satisfying this Condition of Certification.

~~**SOIL & WATER-5:** The project owner shall provide the CPM with all information/data necessary to satisfy the requirements of the Well Destruction Permit for removal and closure following construction of the one remaining water well consistent with the requirements of Santa Clara Valley Water District's (SCVWD's) Ordinance No. 90-1.~~

~~**Verification:** At least 60 days prior to site mobilization, the project owner shall submit all elements required for a Well Destruction Permit to the CPM for review and approval and to the SCVWD for review and comments.~~

Staff received the confirmation of the destruction of the remaining well, number 6, and this condition (SOIL & WATER 5) has been met.

SOIL & WATER-6: The project owner will install metering devices and/or utilize meters installed by the City of San Jose in order to record on a monthly basis the amount of recycled water used by the project. The project owner shall prepare an annual summary, which will include the monthly range and monthly average of daily usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet. For subsequent years, the annual summary will also include the yearly range and yearly average water use by the project. This information will be supplied to the CPM.

Verification: The project owner will submit as part of its annual compliance report a water use summary to the CPM on an annual basis for the life of the project. Any significant changes in the water supply for the project during construction or operation of the plant shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change.

SOIL & WATER-7: The project owner shall provide the CPM with all information/data necessary to satisfy the requirements of the User Agreement for Recycled Water under the South Bay Water Recycling (SBWR) Program including any additional documentation associated with recent or planned modification affecting recycled water use rates.

Verification: At least 60 days prior to initial operation, the project owner shall submit all documents needed to support the increased recycled water supply quantities for Phase 2 that are submitted to the City of San Jose, and a copy of the User Agreement with the City of San Jose to the CPM.

SOIL & WATER-8: The project owner shall provide the CPM with all information/data necessary to satisfy the requirements of the Industrial Wastewater Discharge Permit for its proposed disposal of industrial and sanitary waste into the San Jose/Santa Clara WPCP.

Verification: At least 60 days prior to operation the project owner shall submit copies of all elements submitted to the City of San Jose for the Industrial Wastewater Discharge Permit, and a copy of the permit to the CPM when issued.

SOIL & WATER-9: The project owner shall provide the CPM with evidence of submitting an accepted Engineer's Report for Title 22 Reclamation Requirements to the CA Department of Health Services, as applicable for obtaining unrestricted use of recycled water.

Verification: At least 30 days prior to project operation, the project owner shall submit to the CPM evidence of submitting an Engineer's Report for Title 22 Reclamation Requirements to the CA Department of Health Services.

SOIL & WATER-10: The project owner shall provide the CPM with evidence of pre-construction notification and consultation with the Army Corps of Engineers regarding compliance with Nationwide Permit #'s 7 and 33, consistent with Section 404 of the Clean Water Act, if necessary, for

placement of the storm water outfall and/or temporary construction, access and dewatering in Coyote Creek. In association with obtaining authorization for use of Nationwide Permit #'s 7 and 33, the Project owner may be directed to obtain Section 401 Water Quality Certification from the SWRCB.

Verification: At least 30 days prior to construction of the storm water outfall, the project owner shall submit to the CPM evidence of consultation with the Army Corps of Engineers (ACOE) and authorization from the ACOE regarding Nationwide Permits #'s 7 and 33 as needed to comply with Section 404 of the Clean Water Act. If Nationwide Permits #'s 7 and 33 are required, at least 30 days prior to construction of the storm water outfall, the project owner shall submit evidence to the CPM regarding Section 401 Water Quality Certification from the SWRCB.

REFERENCES

LECEF (Los Esteros Critical Energy Facility). 2001. Application for Certification, Volume 1 & Appendices, Los Esteros Critical Energy Facility (01-AFC-12). Dated August 3, 2001 and docketed August 6, 2001.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Energy Commission Decision. July 2, 2002.

CEC (California Energy Commission) 2004b. Los Esteros Critical Energy Facility Project (03-AFC-2) Final Staff Assessment for Phase 1. November 15, 2004.

CEC (California Energy Commission) 2005. Los Esteros Critical Energy Facility Project (03-AFC-2) Energy Commission Decision for LECEF II, Phase 1. March 16, 2005. Publication Number CEC-800-2005-002-CMF

Hoock, C. 2004. Plant Manager, Calpine Corporation. Site visit conversation with Lorraine White (California Energy Energy Commission) regarding LECEF Phase 1 construction and operation. March 24, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Energy Commission Staff Data Requests 1-57. April 30, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004c. Response to Soil and Water Resources Compliance Data Requests (01-AFC-12c). May 6, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004d. Responses by LECEF Staff during Staff Assessment Workshop in San Jose. October 22, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2005. SCVWD's Completion Notice from its Water Resources Information System for Destruction & Closing Well #6,. Notice dated January 18, 2005. Well Destruction verified by SCVWD's inspection dated July 27, 2002.

SJSC WPCP. (San Jose/Santa Clara Water Pollution Control Plant) 2004. Clean Bay Strategy: South Bay Watershed Activities Status Report. February 2004. Administered by the Environmental Services Department, City of San José.

Shipes, R. 2004a. Deputy Director of Environmental Services Department, City of San Jose. Telephone conversation with Lorraine White (California Energy Energy Commission) regarding LECEF wastewater discharge. May 28, 2004.

Shipes, R. 2004b. Deputy Director of Environmental Services Department, City of San Jose. Telephone conversation with Lorraine White (California Energy Energy Commission) regarding LECEF wastewater discharge. June 16, 2004.

Shipes, R. 2004c. Deputy Director of Environmental Services Department, City of San Jose. Email correspondence to Lorraine White (California Energy Energy Commission) regarding LECEF wastewater discharge. July 2, 2004.

Shipes, R. 2004d. Deputy Director of Environmental Services Department, City of San Jose. Letter dated October 15, 2004 to Lorraine White (California Energy Commission) addressing effects of LECEF recycled water use and wastewater discharge.

Tetzloff, Rick. 2004. Calpine Project Manager electronic Mail to R. Worl, California Energy Commission. Additional Information for Water Analysis Including Correspondence sent to City of San Jose dated September 13, and 28, 2004. Sent to Energy Commission on October 1, 2004.

San Jose. 2003. City of San Jose. Recycled Water Quality for the SBWR Program - 2003 Report Data: http://www.ci.san-jose.ca.us/sbwr/Downloads/WQI2003.pdf

TRAFFIC & TRANSPORTATION

Testimony of Amanda Stennick

INTRODUCTION

The Traffic and Transportation Section of this Final Staff Assessment is an objective analysis of the transportation systems in the vicinity of the project and addresses the Los Esteros Critical Energy Facility's LLC (LECEF, LLC) compatibility with applicable laws, ordinances, regulations, and standards (LORS). It also identifies potential impacts related to the construction and operation of the project on the surrounding transportation systems and roadways, and potential mitigation measures to avoid or lessen those impacts. This analysis also includes an evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, the movement of these workers can increase roadway congestion and also affect traffic flow.

Staff has analyzed the information provided in the Application for Certification (AFC) and other sources to determine the potential for the LECEF to have significant traffic and transportation impacts, and has assessed the availability of mitigation measures that could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Federal, state, and local regulations that are applicable to the proposed project are listed below. Included are regulations related to the transportation of hazardous materials, which are designed to control and mitigate for potential impacts. The Applicant has indicated its intent to comply with all federal, state, and local regulations related to the transport of hazardous materials.

FEDERAL

- Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.

STATE

- Section 353 defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Sections 31600-31620 regulate the transportation of explosive materials.

- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of substances presenting inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11 regulate the safe operation of vehicles, including those that are used for the transportation of hazardous materials.
- Sections 25160 et seq. addresses the safe transport of hazardous materials.
- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, the possession of certificates permitting the operation of vehicles transporting hazardous materials is required.
- California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Street and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.
- In accordance with Section 21400 of the California Vehicle Code, and per the California Department of Transportation (Caltrans), all construction within the public right-of-way will need to comply with the “Manual of Traffic Controls for Construction and Maintenance of Work Zones.”

LOCAL

The Santa Clara Valley Transportation Authority (VTA) oversees the Santa Clara County Congestion Management Plan (CMP). The County and cities within are mandated by State legislation to implement a deficiency plan whenever applicable roadways operate below an adopted minimum level of service. The Transportation and Circulation Element in the 1994 San Jose General Plan sets forth goals, policies, and implementation programs related to traffic issues in the city. These goals include minimum level of service (LOS) standards for local routes, regional routes, and state highway facilities. LOS measurements represent the flow of traffic. In general, LOS ranges from “A” with free flowing traffic to “F”, which is heavily congested with flow stopping frequently. The General Plan lists the following policies:

- The City’s LOS standards for the state highway system and specific routes of regional significance shall be those standards adopted in the Santa Clara County CMP; and

- The City shall require all new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase.

The City of San Jose has defined the desirable minimum level of service for its local intersections to be D during peak commute times. The Santa Clara County CMP also desires a minimum LOS D but allows a LOS E on certain routes of regional significance as well as state highway facilities.

The City of San Jose considers a traffic impact significant if it causes a local intersection to deteriorate below LOS D. If the intersection is already operating at LOS E or F, a traffic impact is considered significant if it causes an increase in the average stopped delay[1] for the critical movements by four seconds or more and the critical Volume/Capacity[2] (V/C) value to increase by 0.01 or more.

The CMP considers a traffic impact significant if it causes a regional intersection to deteriorate below LOS E. If the intersection is already operating at LOS F, a traffic impact is considered significant if it causes an increase in the average stopped delay for the critical movements by four seconds or more and the critical V/C value to increase by 0.01 or more.

The CMP considers an impact to the freeway system significant if it causes the segment to operate below LOS E, or contributes in excess of 1% of segment capacity[3] to a segment already operating at LOS F.

The General Plan states that truck traffic is encouraged to use state freeways, county expressways, six-lane arterials, and those routes that have the least adverse impact on residential areas. The plan also states that truck travel on neighborhood streets should be minimized, and freight loading and unloading should not occur on public streets.

SETTING

REGIONAL SETTING

The primary roadway corridors in the North San Jose region are Interstate 880 (I-880), US 101, and State Route (SR) 237. I-880 is oriented north/south and provides a connection between Oakland and Campbell. This facility is under the jurisdiction of the California Department of Transportation (Caltrans), serving approximately 183,000 vehicles on a daily basis. In the vicinity of the proposed LECEF, I-880 is a 6-lane

[1] Average Stopped Delay is the total stopped time delay experienced by all vehicles in an approach or lane group during a designated time period divided by the total volume entering the intersection in the approach or lane group during the same time period. The stopped time delay is the time an individual vehicle spends stopped in a queue while waiting to enter an intersection.

[2] Volume/Capacity (V/C) is a measure of the overall sufficiency of an intersection. It is typically referred to as degree of saturation. Sustainable values of V/C range from 0, when the flow rate is zero, to 1.0, when the flow rate equals capacity.

[3] The CMP specifies that freeway capacity for a 6-lane segment is 2,300 vehicles per hour per lane (vphpl) and 2,200 vphpl for a 4-lane facility.

freeway, with three (3) mixed flow lanes in each direction. Access to the project site from I-880 is provided via the SR 237 interchange, which is located a mile to the east.

US 101 provides north-south regional access and extends almost the entire length of California, although in the vicinity of the project, US 101 is an east/west facility. US 101 is an 8-lane freeway with three (3) mixed-flow and one (1) high-occupancy vehicle (HOV) lane in each direction. Approximately 166,000 vehicles travel on this facility on a daily basis, which is under Caltrans' jurisdiction. US 101 intersects with I-880 in San Jose approximately 4 miles to the south, and SR 237 in Mountain View approximately 5 miles to the west of the proposed LECEF.

LOCAL SETTING

SR 237 extends from US 101 to I-880 in an east/west direction and is located immediately south of the proposed LECEF site. The facility is a 6-lane freeway with one (1) HOV lane in each direction and is under the jurisdiction of Caltrans. SR 237 serves 115,000 vehicles per day.

The project site is located east of Zanker Road (directly north of SR 237) in the Alviso area of North San Jose and the County of Santa Clara. The primary routes to the site are Zanker Road and SR 237. The access road to the site is the newly constructed Thomas Foon Chew Way, approximately 0.2 miles north of SR 237. Zanker Road is classified as an arterial from the access road south and a major collector north of the access road. Zanker Road is two lanes north of SR 237 and varies between 2 and 4 lanes to the south. Tasman Drive is an east-west four-lane arterial that extends from Lawrence Expressway to I-880. Montague Expressway is a six-lane expressway with one lane in each direction provided for HOVs.

Railways

Four regional rail operators are in the Bay Area: BART, CalTrain Peninsula Commute Service, Muni Metro, and Santa Clara Light Rail Transit (City of Santa Clara 1992). There are no light rail stations in the immediate vicinity of the proposed LECEF site.

Public Transportation

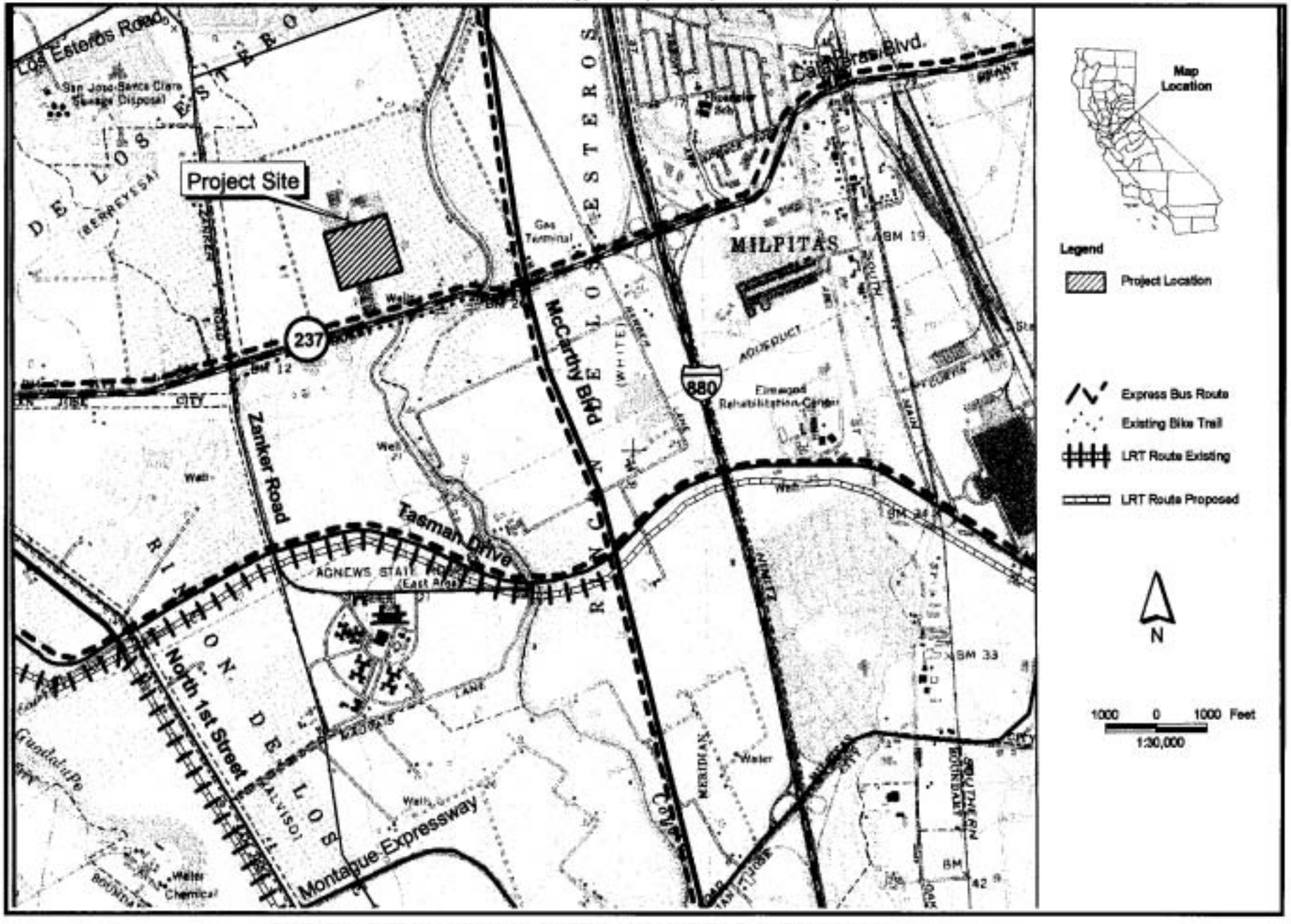
Public transportation in the area is provided by Santa Clara Valley Transportation Authority (VTA). The project site is not served directly by any VTA bus lines, but several lines provide service in the area. The nearest VTA Light Rail Transit station is located about 0.8 mile south of the project site on Tasman Drive, east of Zanker Road.

Pedestrians and Bicycles

The Santa Clara Valley Bikeways Map shows Class I and Class II bicycle paths and lanes west of the project site located along the Guadalupe River, and south of SR 237 between Lafayette Street and North First Street. Bike lanes are also shown on Zanker Road and Tasman Drive, west of Zanker Road. The bike path closest to the project site (south of SR 237) is a Class I Bikeway, which is a completely paved, separated right-of-way, shared with pedestrians, and excludes motor vehicle traffic. The Bikeways Map also has a street rating system for on-street bike lanes that indicates how much caution a bicyclist needs to use when cycling along various roads. Extreme to moderate

TRAFFIC AND TRANSPORTATION - FIGURE 1

Los Esteros Critical Energy Facility - Study Area Roadway Network



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, MAY 2005

SOURCE: AFC Figure 8.12-2

caution is necessary when riding along most of the roads near the project site, as is the case with all on-street bike lanes throughout the Bikeways Map.

Trucks

The City of San Jose Streets and Transportation Department estimates citywide truck traffic to average 5.0 percent of total vehicular traffic. The percentage of trucks on SR 237 at US 101 is 5.7 percent and at I-880 is 5.8 percent; for I-880, the percentage of trucks at US 101 is 3.7 percent. To avoid residential areas, the applicant expects truck deliveries to be routed in the following manner: from SR 237 exit northbound at Zanker Road, turn right onto Thomas Foon Chew Way.

Airports

The LECEF has no major commercial aviation centers in the area. The San Jose International Airport is located about five miles to the south of the proposed site and Moffett Federal Airfield is located about six miles to the west. A local airport in Fremont that closed in 1986 for non-airport related development is located about two miles north of the project. 2003 aerial photos show no development has occurred on the vacant site. Because of the distance of the project from the two commercial aviation sites staff does not anticipate any airport-related impacts.

CURRENT ROADWAY AND INTERSECTION OPERATING CONDITIONS

When evaluating a local transportation system, staff uses levels of service (LOS) measurements as the foundation on which to base its analysis. The City of San Jose General Plan set the performance standards for intersections at LOS D during peak commute times while the County CMP allows a minimum threshold of LOS E for certain routes of regional significance. Existing LOS levels for the intersections in the LECEF vicinity based on p.m. peak hour volume are listed below.

- Zanker Road/SR 237 (northbound) LOS B
- Zanker Road/SR 237 (southbound) LOS B
- Zanker Road/Tasman Drive LOS D
- Zanker Road/Montague Expressway LOS A

ANALYSIS AND IMPACTS

THRESHOLDS OF SIGNIFICANCE

Significance criteria are based on California Environmental Quality Act (CEQA) Guidelines, the CEQA Environmental Checklist Form (amended December 1, 1999), and on performance standards or thresholds established by responsible agencies. An impact may be considered significant if the project results in:

- an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);

- a level of service standard established by the county congestion management agency for designated roads or highways, is exceeded either individually or cumulatively;
- a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- a substantial increase in hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- inadequate emergency access;
- inadequate parking capacity; or
- a significant hazard to the public or the environment through the transportation of hazardous material.

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the Commission make any finding in conflict with applicable federal law or regulation.

When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (Pub. Resources Code § 25523(d)(1)). The traffic and transportation laws, ordinances, regulations, standards (LORS), and policies applicable to the project have been analyzed in the Impacts section below to determine the extent to which the LECEF is consistent or at variance with each requirement or standard.

IMPACTS

The following discussion identifies potential traffic impacts associated with the construction of the LECEF, and provides an explanation of the impact conclusion.

Construction Phase

Traffic impacts from the LECEF construction were evaluated based on daily and peak hour volumes. The peak month of construction activity was evaluated to provide a worst case analysis. The applicant states that it expects construction to last about 19 months, with the peak period of construction occurring 11 to 12 months after the start of construction.

Construction Workforce and Truck Traffic

For traffic impact analysis purposes, staff assumes that most of the construction workforce will come from Santa Clara County and surrounding counties. Regardless of where construction traffic originates, construction workers will have to reach the LECEF site by traveling on SR 237 and/or Zanker Road to the primary access road Thomas Foon Chew Way.

The average construction workforce will be approximately 83, with a peak force of 144. The applicant expects the 19-month construction period to last from the summer of 2005 to the winter of 2006. The applicant expects a total of about 1,512 truck deliveries of materials and supplies during the construction period, or about two to three deliveries per weekday. During peak construction, the number of daily truck deliveries will increase to about seven. All truck deliveries will follow the truck route guidance in the San Jose 2020 General Plan, which states that truck traffic is encouraged to use state freeways, county expressways, and six-lane arterials and to use routes that have the least adverse impact on residential areas.

Traffic and Transportation Table 2 presents a summary of the trip generation for the project construction phase. There will be an average of 84 construction workers per month commuting to the site; during the highest level of construction activity (i.e. peak), an average of 144 workers will be commuting to the site. For this analysis, the applicant estimates that the average vehicle occupancy (AVO) will be 1.1 persons per vehicle. When both construction workers' vehicles and delivery trucks are accounted for, the proposed project will generate a total of 82 daily round trips during the average construction months. During the peak construction months, 145 daily round trips are expected.

The applicant estimates that 80 percent of workers and ten percent of deliveries will arrive or depart during peak commute hours. Staff concurs with this estimate. Thus, during the peak commute hours, the proposed project will generate a total of 67 vehicle round trips and 116 vehicle round trips during the highest level of construction activity (i.e. peak). Staff believes that car-pooling should be encouraged whenever possible. If additional carpooling occurs, the worst-case estimates discussed above would be reduced.

Traffic and Transportation Table 2
Trip Generation Summary Table – Construction Phase

	Vehicle Daily Round Trips		**Vehicle Daily Round Trips for Peak Commute Hours** (3)	
	Average	Peak(2)	Average	Peak(2)
Workers(1)	76	131	66	115
Trucks	6	14	1	1
Total	**82**	**145**	**67**	**116**

(1) Assumes an AVO of 1.1 persons per vehicle.
(2) "Peak" refers to scheduled peak quarter of construction activity (months 11 and 12 from notice to proceed).
(3) Peak commute hours are 7:00 a.m. to 8:00 a.m. and 5:00 p.m. to 6:00 p.m.

Based on the existing roadway and freeway capacities, the traffic volumes that will be added to Zanker Road should not significantly affect local and regional intersections. Likewise, the volumes that will be added to the freeway segments along SR 237 should not significantly affect the freeway system.

Changes to Level of Service (LOS)

In order to assess the potential of project-related traffic significantly impacting City of San Jose intersections and/or Caltrans facilities, the following scenarios were analyzed: background traffic; and background plus construction traffic. Background traffic is existing traffic, plus traffic that will be experienced from approved but not yet built projects.

Local Roads In Project Vicinity

For purposes of determining whether the project could cause a change in the existing LOS and cause a significant adverse impact, the applicant made the following assumptions (see **Traffic and Transportation Figure 1**):

- When leaving the site, 99 percent of the traffic will travel south on Zanker Road; about 35 percent will travel west on SR 237; the remaining 14 percent will continue traveling south on Zanker Road.
- Of the traffic that continues to travel south on Zanker Road, 60 percent will turn onto Tasman Drive, and the remaining 40 percent will travel to the Zanker Road-Montague Expressway interchange.

Traffic and Transportation Table 3 lists the existing plus construction traffic for local roads and intersections in the project vicinity. Project construction traffic, using a passenger car equivalent of 2.0 for peak hour trip generation in **Traffic and Transportation Table 2**, was added to existing traffic based on the above assumptions. No traffic data was available for the portion of Zanker Road north of SR 237.

Project construction traffic should not cause a significant adverse impact to the LOS for roads in the project area. However, under certain conditions or circumstances, the assumptions proposed in the Application of Certification (AFC) may not reflect actual project-related traffic patterns and may lead to unmitigated impacts. To ensure that any potential traffic impacts are mitigated to less than significant, staff is proposing a construction traffic control plan and implementation program that limits construction-period truck and worker commute traffic to off-peak periods in coordination with the City of San Jose, County of Santa Clara, and Caltrans. **Condition of Certification TRANS-1** addresses this concern and if followed by the applicant, will ensure that impacts are reduced to a less than significant level.

Traffic and Transportation Table 3
Existing Plus Construction Traffic

Segments	Capacity(1)	Current	With LECEF Construction	Current LOS	LOS With LECEF Construction
SR 237 from the following segments:					
North First Street to Zanker Road (WB)	6,000	5,050	5,091(2)	D	D
Zanker Road to McCarthy Blvd. (WB)	6,000	5,200	5,258 (2)	D	D
McCarthy Blvd. to I-880 (WB)	6,000	5,650	5,708 (2)	F	F
Zanker Road from the following segments:					
SR 237 to McCarthy Blvd. (NB)	1,700	ND	ND	A	A
SR 237 to Tasman Drive (SB)	5,400	1,437	1,457(3)	A	A
Tasman Drive to Montague Exp. (SB)	3,600	1,423	1,430(3)	A	A

1. Highway Capacity Manual 1985
2. Caltrans 2002
3. City of San Jose 2003

Freeway Segments In Project Vicinity

The CMP states that the minimum acceptable LOS is E for freeway segments in the region. They are:

- SR 237 from North First to Zanker (eastbound);
- SR 237 from Zanker to I-880 (eastbound);
- SR 237 from Zanker to North First (westbound); and
- SR 237 from I-880 to Zanker (westbound).

With existing plus project-generated traffic, three of the four segments will continue to operate at the minimum established LOS threshold in the PM peak hour. SR 237 from from Zanker to I-880 Eastbound will operate at LOS F. According to the local freeway segments analyzed by the applicant, SR 237 from Zanker to I-880 Eastbound (without the addition of project-related construction traffic) currently operates at LOS F during the PM peak hour. Therefore, the addition of construction traffic will impact a freeway segment currently operating at below the minimum acceptable LOS standards set by the CMP. Although the impact to SR 237 from Zanker to I-880 Eastbound is considered significant, the impact will only be experienced during the construction phase. Please see discussion below regarding mitigation to address this impact.

Staff's analysis based in the data provided by the applicant shows that with the exception of the impact described above, project construction traffic volumes should not cause significant adverse impacts to the local freeways. However, under certain conditions or circumstances, the assumptions proposed in the AFC may not reflect actual project-related traffic patterns and may lead to unmitigated impacts. In addition, as described, the freeway segment SR 237 from Zanker Road to I-880 Eastbound is expected to continue operating at LOS F, which is below the acceptable threshold for the Santa Clara County CMP.

To ensure that any potential traffic impacts are mitigated to less than significant, staff is proposing a construction traffic control plan and implementation program that limits construction-period truck and worker commute traffic to off-peak periods in coordination with the City of San Jose, County of Santa Clara, and Caltrans. This measure will ensure that project construction workers will not use the severely congested section of SR 237 during the daily peak traffic hours. Thus, Condition of Certification **TRANS-1** will reduce impacts to a less than significant level. Oversize and heavy loads associated with the new cooling tower, new aqueous ammonia tank, piping and the steam turbine generator have the potential to impact road and adjacent pathway conditions. To insure that these impacts are properly identified and mitigation is applied, Condition of Certification **TRANS-5** is added for the LECEF Phase 2 project.

Railways

The applicant does not plan on using any rail line during construction of Phase 2 of the LECEF.

Pedestrians and Bicycles

As stated above, the bike path closest to the project site (south of SR 237) is a Class I Bikeway, which is a completely paved, separated right-of-way, shared with pedestrians, and excludes motor vehicle traffic. Because extreme to moderate caution is necessary when riding along most of the roads near the project site, staff is proposing Condition of Certification **TRANS-1** will reduce any impacts to users of the bike lanes to a less than significant level.

Parking

Onsite parking was more than adequate for LECEF 1. Staff assumes that onsite parking will be adequate for the peak construction of LECEF 2. Parking along Zanker Road or Alviso-Milpitas Road will be prohibited. As in LECEF 1, all parking for LECEF 2 will be contained onsite.

Operation Phase

Workforce and Visitor Traffic

After construction of Phase 2, the LECEF will employ a total of 17 employees, which represents an increase of eight employees from LECEF Phase 1. Existing roadways can easily accommodate this small increase and existing LOS volume will not change.

Staff does not expect any significant long-term traffic impacts as a result of the LECEF's operational workforce and visitor traffic.

Truck Traffic

During operation of the LECEF, trucks would periodically deliver/pickup replacement parts, lubricants, liquid fuels, aqueous ammonia, sulfuric acid, trash, and other consumables. On average, there would be one or fewer truck deliveries (round trips) to the project site per day (LECEF 2004). The anticipated travel route for materials delivery is the SR 237-Zanker Road approach.

The existing highway and roadway system would not be significantly affected by the increase in truck traffic associated with operation of the LECEF. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

Emergency Access

City of San Jose Fire Station No. 29, located on Innovation Drive near Zanker Road, would handle emergency response to the project site. Fire Station 29 is less than three miles from the project site; response time is about six to seven minutes. The Santa Clara County Medical Center, located at 751 South Bascom Avenue, is about ten miles from the project site.

The project will not lead to inadequate emergency vehicle access (EVA). Emergency vehicles that respond to jobsite emergencies are expected to travel from emergency facilities in Milpitas (to the east) or Santa Clara (to the south). Emergency vehicles are expected to access the site from one of three access roads. The primary EVA to the site will be along Thomas Foon Chew Way, which connects with Zanker Road 0.2 miles north of SR 237. If this access road is blocked, emergency vehicles will take a secondary EVA provided from Alviso-Milpitas Road on the south of the proposed facility. An additional EVA will be located 0.4 miles north of SR 237 along Zanker Road. Emergency vehicles from Milpitas will most likely arrive at the site via SR 237 to Zanker Road while emergency vehicles from Santa Clara will most likely arrive at the site on Zanker Road.

During construction operations, emergency vehicles traveling to the site through any of the four study intersections (i.e., those on the expected travel route) will not be significantly impacted since these intersections will operate at better than the minimum established LOS thresholds in the PM peak hour.

Transportation of Hazardous Material

The construction and operation of the plant will require the transportation of various hazardous materials, including: aqueous ammonia, gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, paint thinner, etc. The transport of hazardous materials over city streets has the potential to result in an increase in traffic hazards. The LECEF AFC has indicated that the transportation of hazardous materials to and from the site will be conducted in

accordance with all applicable LORS for the handling and transportation of hazardous materials. All hazardous material deliveries should be routed as follows: from SR 237 exit northbound at Zanker Road, turn right onto the primary access road and enter the LECEF (see **Condition of Certification TRANS-3**). Implementation of **TRANS-3** will mitigate the potential impact to a less than significant level.

CUMULATIVE IMPACTS

Staff identified eight projects in the region that lie within two miles of the proposed LECEF that could affect the regional traffic and transportation network. These projects are as follows:

- Northeast San Jose Transmission Reinforcement Project – Approved; construction date is unknown.
- US DataPort Facility - Approved but on hold; construction activity is unknown.
- Palm Corporation Industrial Campus – Approved but on hold; construction date is unknown.
- Cisco Systems Industrial Campus - Approved but on hold; construction date is unknown.
- Irvine Company Apartment Complex – Approved and under construction.
- Veritas Software Industrial Campus – Approved and under construction.
- Irvine Company Business Park – Approved and under construction.
- Office Park Developments – Approved and under construction.

Four of the eight projects are either on hold or have an undetermined construction schedule. The remaining four projects are in various phases of construction. Three of the four projects under construction lie to the east of the LECEF and would most likely access SR 237 at locations east of the interchange at Zanker Road closer to I-880. The remaining office park development project lies a mile south of SR 237 and the LECEF, and would likely access SR 237 at Zanker Road from the south. Construction of the previously approved US DataPort project is currently speculative based on economic conditions. Operational traffic associated with the LECEF 1 will be minimal and will not significantly affect construction traffic for either LECEF Phase 2 construction, or other projects listed above. Since traffic generated by the LECEF Phase 2 construction will be temporary and will occur during off-peak hours, as required by Condition of Certification **TRANS-1**, staff concluded that there will be no significant cumulative impacts.

FACILITY CLOSURE

The planned life of the generation facility is 30 years. Facility closure requirements are discussed in detail in the **GENERAL CONDITIONS** section of this Staff Assessment. At least 12 months prior to the proposed decommissioning, the applicant shall prepare a Closure Plan for submission to the Energy Commission for review and action. At the time of closure all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of the LECEF closure on

traffic and transportation would be similar to those discussed for the project itself. Closure would create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials would produce impacts from truck traffic.

MITIGATION

The applicant should implement the following traffic and transportation mitigation measures:

- Prepare a construction traffic control plan with input from the City of San Jose, Santa Clara County, and Caltrans (Condition of Certification **TRANS-1**).
- Obtain and comply with all necessary transportation permits from Caltrans, and the City of San Jose and Santa Clara County, and other jurisdictions regarding the transportation of heavy equipment and hazardous materials and any construction activity within the public right-of-way (Conditions of Certification **TRANS-2 & 3**).
- Enforce a policy that all project-related parking occurs in designated parking areas on the LECEF site (Condition of Certification **TRANS-4**).
- Document existing road, trail and pathways conditions and repair any damage or deterioration occurring as a result of Phase 2 construction traffic (Condition of Certification **TRANS-5**).

COMPLIANCE WITH LORS

The applicant has stated its intention to comply with all federal, state and local LORS. Staff has recommended conditions of certification that will ensure compliance with identified federal, state, and local LORS, including those applicable to the City of San Jose, Santa Clara County, and Caltrans.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS AND RECOMMENDATIONS

Provided that the applicant develops a construction traffic control and implementation program, and follows all LORS acceptable to the City of San Jose, County of Santa Clara, and Caltrans for the handling of hazardous materials, the project will result in less than significant impacts.

The conditions of certification proposed below are those that staff has identified as necessary to mitigate project impacts and assure compliance with LORS. If the Energy Commission certifies the LECEF Phase 2, staff recommends that it adopt the following Conditions of Certification.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall develop a construction traffic control plan that limits peak hour construction-period truck and commute traffic in coordination with the City of San Jose Public Works Department. The project owner shall also consult with Santa Clara County, Caltrans, and the City of San Jose staff dealing with traffic regulation enforcement. Specifically, the overall traffic control plan shall include the following:

- Require the primary contractor and major subcontractors to develop and implement a construction employee carpool program;
- Through worker education and shift scheduling, maximize worker commute trips during off-peak hours (off-peak hours are (1) before 6:00 AM; (2) between 9:00 AM and 4:00 PM; and (3) after 6:00 PM or other hours as agreed to by the CPM;
- Schedule heavy vehicle equipment and building material deliveries as well as the movement of materials and equipment to the site, including the adjacent lay-down area to occur during off-peak hours;
- Signing, lighting, and traffic control device placement;
- Temporary travel lane closures and potential need for flagmen;
- Maintaining access to adjacent residential and commercial properties; and
- Emergency access.

Verification: At least 60 days prior to start of site mobilization, the project owner shall provide to Santa Clara County, the City of San Jose, and the California Highway Patrol for review and comment, and to the CPM for review and approval, a copy of its construction traffic control plan.

TRANS-2 The project owner shall comply with California Department of Transportation (Caltrans) and other affected jurisdictions' limitations on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

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

TRANS-3 The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of all hazardous materials, and that all federal and state regulations for the transport of hazardous materials are observed.

Verification: The project owner shall include in its Monthly Compliance Reports during construction and Annual Compliance Reports during operations copies of all

permits and licenses acquired by the project owner concerning the transport of hazardous materials.

TRANS-4 Prior to the construction of the power plant and all related facilities, the project owner shall develop a parking and staging plan for all phases of project construction, to enforce a policy that all project related parking occurs onsite.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the plan to the City of San Jose Public Works staff for review and comment, and to the CPM for review and approval. The material submitted to the CPM shall include documentation of the City's review and comments. Monthly Compliance Reports submitted to the CPM shall describe the project owner's actions to ensure that this condition is being met.

TRANS-5 The project owner shall repair affected public rights-of-way (e.g., highway, road, bicycle path, pedestrian path, etc.) to original or near original condition that have been damaged due to construction activities conducted for the project and its associated facilities.

Verification: Within 60 calendar days after completion of construction, the project owner shall meet with the CPM, the affected local jurisdiction(s) and Caltrans (if applicable) to identify sections of public right-of-way to be repaired, to establish a schedule to complete the repairs and to receive approval for the action(s). Following completion of any public right-of-way repairs, the project owner shall provide to the CPM a letter signed by the affected local jurisdiction(s) and Caltrans stating their satisfaction with the repairs.

REFERENCES

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

Data Requests and Responses – (Data Requests Nos. 65-79) Submitted to the California Energy Commission, September 2001.

California Department of Transportation (Caltrans). 2001. 1998 Annual Average Daily Truck Volumes, Traffic on the California State Highway System.

California Department of Transportation (Caltrans). 2001. 2000 Traffic Volumes on the California State Highway System.

County of Santa Clara. 1994 Santa Clara County General Plan.

San Jose Department of City Planning and Building. 1994. San Jose 2020 General Plan.

Santa Clara Valley Transportation Authority, 1997. Traffic Levels of Service Analysis Guidelines.

Santa Clara County Congestion Management Plan, May 1998.

Transportation Research Board. 1985. Highway Capacity Manual Special Report 209.

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

The energy from the operating Los Esteros Critical Energy Facility (LECEF) is currently being delivered to the Pacific Gas and Electric (PG&E) power grid through a 150-ft, overhead, wood-pole 115 kV transmission line connecting the project's switchyard to PG&E's 115 kV Los Esteros-Nortec transmission line immediately to the west of the switchyard. While Phase 1 of the present application seeks to re-certify the existing 180 megawatt (MW) simple-cycle gas-fired project and its 115 kV line, Phase 2 seeks a permit to convert the LECEF to a 320 MW combined-cycle project increasing power generation by 140 MW. The generated power would be transmitted at 230 kV through two new 200-ft overhead lines connecting the upgraded facility to a new Silicon Valley Power (SVP) Switching Station located immediately north of the existing LECEF power plant substation (LECEF 2003, pp. 2-1, 2-13, 5-1, and 5-7). The new SVP Switching Station will connect PG&E's Los Esteros Substation to the SVP Northern Receiving Station (LECEF 2003, p. 5-1). At the completion of the Phase 2 combined-cycle conversion and interconnection to the SVP Switching Station, the current Phase 1 115 kV connection to the Los Esteros-Nortech line will be removed.

The new Phase 2 230 kV, 200-ft line would lie within the boundaries of LECEF and the SVP Switching Station where there would be neither public access nor nearby residences. As with the existing 115 kV Phase 1 line, this lack of public access and nearby residences means that the long-term residential field exposures and other field impacts at the root of the present health and safety concern would be insignificant during operations. Since electric power is the product of applied voltage and current level, transmitting the generated power at 230 kV would reduce the level of magnetic field that would have resulted from continued transmission at the 115 kV being applied to the Phase 1 line. The applicant proposes to design, build, and operate the proposed Phase 2 lines in compliance with the applicable safety Laws, Ordinances, Regulations, and Standards regarding aviation safety, interference with radio-frequency communication, audible noise, fire hazards, hazardous shocks, nuisance shocks, and electric and magnetic field exposure (LECEF, 2003, p. 5-1). These categories of impacts and related mitigation measures were addressed in the Final Staff Assessment (CEC, 2002), and summarized in the Commission Decision for the original LECEF (CEC, 2002b, pages 89-92).

The Commission Decision for Phase 1, published November 15, 2004, discusses the recertification of the current simple-cycle facility. Staff has further reviewed the applicable laws, ordinances, regulations and standards (LORS) for any changes that apply to the proposed Phase 2 combined-cycle application. Based upon these reviews and the information in the current Phase 2 AFC (03-AFC-2), staff concludes that there would be no unmitigated environmental impacts resulting from permitting the new 230 kV Phase 2 lines as proposed by the applicant.

The specific proposal to design, build and operate these new 230 kV lines according to the listed California Public Utilities Commission (CPUC) requirements and industry practices constitutes compliance with the health and safety LORS of concern to staff. Staff's line-related recommended conditions of certification are listed below.

The purpose of this staff analysis is to assess the proposed interconnection line's construction and operation plan for incorporation of the measures necessary to minimize the related field and non-field impacts whose reduction remains the focus of the current laws, ordinances, regulations, and standards (LORS). If such compliance were established, staff would recommend approval with respect to the issues of concern in this analysis; if not, staff would recommend revisions as appropriate. Staff's analysis focuses on the following issues as related primarily to the physical presence of the lines, or secondarily, to the physical interactions of their electric and magnetic fields:

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Discussed below by subject area are design-related LORS applicable to the physical impacts of the overhead transmission lines as proposed to connect the LECEF Phase 2 with the Silicon Valley Power (SVP) 230 kV Switching Station. The potential for these impacts is assessed in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local jurisdictions require such lines to be located underground in new housing developments because of the potential for visual impacts on the landscape. Such requirements are not related to the concern over health effects.

AVIATION SAFETY

Any potential hazard to area aircraft would relate to the potential for collision in the navigable air space. The applicable federal LORS, as discussed below, are intended to ensure the distance and visibility necessary to prevent such collisions.

Federal

- Title 14, Part 77 of the Federal Code of Regulations (CFR), "Objects Affecting the Navigation Space."

Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid the aviation hazards of concern.

- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that May Affect the Navigation Space.” This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting.” This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation 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.

Electric fields are unable to penetrate most materials, including the soil, therefore, such interference and other electric field effects are not associated with underground lines. The level of any such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for perception could be assessed from considering the field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

Federal

Federal Communications Commission (FCC) regulations are specified in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff recommends specific conditions of certification as necessary to ensure compliance with this FCC requirement.

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 inductive interference.

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

AUDIBLE NOISE

Industry Standards

There are no design-specific federal or state regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All modern overhead high-voltage lines are designed to assure compliance with such noise limits. As with radio-frequency noise, such 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 kV or higher. It is, therefore, not generally expected at significant levels from those of less than 345 kV as proposed for LECEF Phase 2. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

FIRE HAZARDS

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

State

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

HAZARDOUS SHOCKS

The hazardous shocks addressed by the following regulations and standards 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.

State

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

Title 8, California Code of Regulations, Section 2700 et seq.: “High Voltage Electric Safety Orders,” establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

Industrial Standards

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 in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

NUISANCE SHOCKS

Industry Standards

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 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). As with the proposed overhead lines, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff recommends specific conditions of certification as necessary to ensure that such grounding is made along the proposed route.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans.

However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate in light of present uncertainty, to 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 in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It 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. 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 applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability, efficiency, and maintainability. 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 the 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 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 LECEF Phase 2 connection line according to existing SVP field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management. Staff recommends a specific condition of certification (**TLSN-1**) to ensure implementation of the design measures necessary.

Industrial Standards

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF health issue.

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

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component whose effects can manifest themselves as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate soil, building and other materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible 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, 1995). 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.

SETTING

The LECEF is located within a 34-acre project site that includes the 21-acre fenced area of the LECEF and the facility's surrounding landscaping. The project site includes a vacant 13-acre site, adjacent to the south sound wall, proposed for use as the phase 2 construction lay-down area. The project address is 800 Thomas Foon Chew Way in north San Jose. South of the project parcel is State Route 237. To the east is agricultural land, and further east is Coyote Creek. To the north is agricultural land and open space buffer lands belonging to the Water Pollution Control Plant (WPCP). To the west is undeveloped WPCP buffer land and about 2,500 feet west of the LECEF Zanker Road runs north-south. The PG&E Los Esteros Substation, and the new Silicon Valley Power (SVP) 230 kV Switching Station, are immediately north of the LECEF. See the Phase 2 Project Description section for more detail, and **Project Description Figure 2** showing the orientation of these features. There is a single residence 450 feet from the project site to the southeast, and six tenths of one mile (0.6/mile) to the south across SR 237 is a trailer park residential area. Since the 200 foot-long 230 kV transmission line is completely within the fence line of the LECEF and the newly-constructed SVP Switching Station, no residences are in the immediate vicinity of the proposed LECEF and point of interconnection. This insures that the residential magnetic field exposure at the root of the present health concern would be insignificant for this project. 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 transit under the project's lines. These types of exposures are short term and well understood as not significantly related to the present health concern. The same lack of nearby residences means that the previously noted electric field-related communication impacts would be unlikely from operations.

PROJECT DESCRIPTION

The proposed LECEF interconnection will consist of :

- two new 115/230 kV step up transformers;
- two new overhead lines connecting the LECEF 115 kV switch yard to the new 115/230 kV transformers; and
- two new 200 foot-long overhead lines connecting the new transformers to the 230 kV SVP Switching Station.

The proposed Phase 2 project would expand the existing LECEF switchyard to include two short 230 kV connecting lines and two 115/230 kV transformers. The expanded switchyard or substation would then connect to the SVP Switching Station through two 200-foot long three-phase single circuit 230 kV overhead transmission lines. Each of these transmission circuits would be sized to carry the output of the entire facility. The switchyard expansion and transmission lines would be built within the fenceline of the existing project and will not require new rights-of-way. When the interconnection of Phase 2 is completed the existing Phase 1 tap interconnection to PG&E's Los Esteros – Nortech 115 kV circuit would be removed (LECEF 2004a, Page 5-2).

In addition to connecting the Phase 2 combined-cycle output of the LECEF to SVP, the Updated Final System Impact Study (PG&E, 2004b, pp. 2, and 19) also analyzes the impacts of connecting the Phase 1 simple-cycle power output to the new SVP Switching Station. This interconnection of the Phase 1 output would involve adding the new LECEF transformers, and making the identical connections described above for Phase 2, converting the simple-cycle output to 230 kV from its current 115 kV. With this option the addition of the new 115/230 kV transformers and interconnecting LECEF to the SVP Switching Station could occur earlier and independently from the Phase 2 combined-cycle conversion. This would further reduce the potential magnetic field impacts by increasing the transmission of the 180 MW output to 230 kV from the current 115 kV transmission circuits.

Since the proposed interconnection lines would be designed and operated according to standard SVP practices, its design-driven field strengths (and, therefore, potential contribution to existing area field levels) should be at the same level expected for SVP and PG&E lines of the same voltage and current-carrying capacity. Staff recommends a specific condition of certification (**TLSN-2**) to provide the data necessary for the required compliance assessment.

IMPACTS

PROJECT SPECIFIC IMPACTS

Aviation Safety

Given these conditions, staff considers the proposed interconnection line as unlikely to pose a significant obstruction-related aviation hazard to utilizing aircraft as defined using current FAA criteria. Therefore, no FAA “Notice of Construction or Alteration” would be required.

Interference with Radio-Frequency Communication

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware, and other discontinuities around the conductor surface. The proposed lines would be built and maintained according to standard SVP practices, minimizing such surface irregularities and discontinuities (LECEF 2003, p. 5-7). 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, even in rainy weather when the presence of raindrops increases the strengths of the offending surface electric fields. The intended low-corona design would be the same as used for exiting SVP and adjacent PG&E lines of similar voltage rating. Since these existing lines do not currently produce the corona effects of specific concern, staff does not expect any corona-related radio-frequency interference in the area around the line. Moreover, the line would be located within the LECEF property lines in an area without residences making it unnecessary to recommend a specific condition on the issue of residential radio or television signal interference.

Audible Noise

As happens with radio noise, the low-corona design to be used for the proposed LECEF lines would serve to minimize the potential for corona-related audible noise. This means, as noted by the applicant (LECEF 2003, p. 5-7), that the proposed line operation would be unlikely to add significantly to current background noise levels in the project area. For an assessment of the noise from all phases of the proposed project and related facilities, please refer to staff's analysis in the **Noise and Vibration** section of this Preliminary Staff Assessment.

Fire Hazards

Standard fire prevention and suppression measures for all LECEF lines would be implemented for the proposed interconnection line (LECEF 2003, p. 5-8). The applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this compliance approach. Moreover, the line would be located within LECEF's property lines without the trees that could pose a fire hazard from line contact.

Hazardous Shocks

The applicant's stated intention to implement the GO-95- related measures against direct contact with the energized line (LECEF 2003, pp. 5-5 and 5-8 through 5-11) 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

The potential for nuisance shocks around the proposed line would be minimized through standard industry grounding practices (LECEF 2003, pp. 5-8 through 5-11). Staff recommends Condition of Certification **TLSN-2** to ensure such grounding.

Electric and magnetic field exposure

As noted by the applicant (LECEF 2003, p. 5-8, and Volume II Appendix 5-B), specific field strength-reducing measures would be incorporated into the proposed connecting line design to ensure the field strength minimization currently required by CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include:

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.

Connecting the proposed LECEF Phase 2 line to the SVP-related equipment of the same voltage would not change the existing voltages within the area transmission grid. Staff recommends specific field strength measurements in Condition of Certification **TLSN-3** to verify that the LECEF Phase 2-related voltage would not change the existing electric fields without significant changes to the applied voltage. These measurements would also allow for comparison with electric fields from SVP lines of the same design and voltage. The recommendation for magnetic field strength measurements would allow for comparison with magnetic fields from SVP lines of the same design and current-carrying capacity as well as those from similar lines in the few states with specific limits on line magnetic fields. These magnetic field strength limits vary from 150 to 250 mG established (depending on voltage level) for the edges of the rights-of-way.

Since optimum field-reducing measures have been incorporated into the proposed line design, staff considers further mitigation to be unnecessary at this point, but would seek to validate the applicant's assumed reduction efficiency by comparing the values from the recommended field strength measurements with field strengths typical of SVP lines of similar voltage and current-carrying capacity.

CUMULATIVE IMPACTS

Since the proposed LECEF Phase 2-related transmission lines would be designed according to applicable field-reducing SVP guidelines (as currently required by the CPUC for effective field management), staff expects the resulting fields to be similar in intensity to fields from lines of the similar voltage and current-carrying capacity. Any contribution to cumulative area exposures would 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 utility service area be designed to incorporate the field strength-reducing guidelines of the main utility, which for LECEF Phase 2 will be SVP. Since the proposed connection lines would be designed according to the requirements of GO 95, GO 52, and Title 8, Section 2700 et seq. of the California Code of Regulations and operated and maintained according to current SVP 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-2**.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for overhead and underground lines, the public health significance of any LECEF Phase 2-related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent CPUC considers appropriate in light of the available health effects information. Long-term, mostly residential magnetic exposure would be insignificant for the proposed interconnection lines 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 lines of similar designs and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures to be implemented in keeping with current SVP guidelines (reflecting standard industry practices). 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 General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, should be adequate to minimize any fire hazards. Since there are no major airports or aviation centers in the immediate project area, staff does not expect the proposed line to pose a significant aviation hazard. The use of low-corona line design, together with appropriate corona-minimizing construction practices, minimizes the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed route.

RECOMMENDATIONS

Since the interconnecting LECEF Phase 2, or Phase 1, 230 kV lines would be designed to minimize the safety and nuisance impacts of specific concern to staff, and located at a site with no nearby residences, staff does not recommend further mitigation and recommends approval of the proposed design and operational plan. If such approval is granted, staff recommends that the Energy Commission adopt the conditions of certification specified below to ensure implementation of the measures necessary to achieve the field reduction and line safety assumed by the applicant.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall build the proposed and any future underground interconnection lines according to the requirements of CPUC's GO-128.

Verification: Thirty days before line-related ground disturbance, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the proposed line will be constructed according to the requirements of GO-128.

TLSN-2 The project owner shall engage a qualified consultant to measure the strengths of the magnetic fields from SVP to LECEF's switchyard. Measurements shall be made at the same points (identified as Points A, B, C, and D) for which calculated field strength measurements were provided by the applicant.

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

TLSN-3 The project owner shall build the proposed overhead 230 kV interconnection lines according to the requirements of CPUC's GO-52, (and GO-128 if underground) Title 8, Section 2700 et seq. of the California Code of regulations, and PG&E's EMF reduction guidelines arising from CPUC Decision 93-11-013.

Verification: Thirty days before line-related ground disturbance, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the proposed line will be constructed according to the requirements noted above.

REFERENCES

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

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. July 2, 2002.

CEC (California Energy Commission) 2004. Commission Order Approving Project Modification: Approving a Shorter Temporary Transmission Tap Line (Order No 04-0121-06). January 21, 2004.

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

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

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.

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

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.
Electric and Magnetic fields. National Academy press, Washington.

VISUAL RESOURCES

Testimony of Eric Knight

INTRODUCTION

Visual resources are the natural and man-made features of the environment that can be viewed. This analysis focuses on whether construction and operation of the Los Esteros Critical Energy Facility (LECEF), Phase 2 Project would cause significant impacts to visual resources in the vicinity of the project, and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards (LORS). This analysis complies with the California Environmental Quality Act (CEQA), which requires that government agencies make a determination of the potential for visual impacts resulting from a proposed project.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- description of analysis methodology;
- description of applicable LORS;
- description of the project aspects that may have the potential for significant visual impacts;
- assessment of the visual setting of the proposed power plant site and linear facility routes;
- evaluation of the visual impacts of the proposed project on the existing setting;
- evaluation of the project's compliance with applicable LORS;
- identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and/or to achieve compliance with applicable LORS; and
- conclusions and recommendations.

ANALYSIS METHODOLOGY

Visual resources analysis has an inherently subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Significance Criteria

Energy Commission staff considered the following criteria in determining whether a visual impact would be significant.

The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or aesthetic significance" (Cal. Code Regs., tit.14, § 15382).

Appendix G of the CEQA Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant.

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway corridor?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Evaluation Process

For the Visual Resources analysis, staff first examined the planning documents, such as General Plans and Specific Plans, applicable to the project area to gain insight as to the type of land uses intended for the area, and the guidelines given for the protection or preservation of visual resources. Staff then considered the existing visual setting within the project viewshed, which is defined as the geographical area in which the project can be seen. Staff estimated the visual changes that the project would cause to determine impact significance, following the four CEQA Guidelines checklist questions listed above. Please refer to **Appendix VR-1** at the end of this section of the Final Staff Assessment (FSA) for a more complete description of staff's Visual Resources evaluation process.

Staff examined potential impacts using a Key Observation Point (KOP) analysis, among other tools and information sources. Existing condition photographs, and visual simulations of those same views after project development, were prepared for each KOP. KOPs were selected to be representative of the most sensitive locations from which the project would be seen, but they are not the only locations that staff considered in each view area. Two of the three KOPs from the original simple-cycle LECEF AFC (01-AFC-12) have been used to analyze the visual impacts of the proposed LECEF Phase 2 (conversion to combined-cycle). The locations of these KOPs are shown on **Visual Resources Figure 1**. KOP 1 is located on the Zanker Road onramp to eastbound State Route (SR) 237. KOP 2 is located on Zanker Road to the west of the LECEF site. KOP 3 from the original LECEF AFC has not been used in this analysis. This viewpoint is located about 1.75 miles west of the LECEF site at Grand Boulevard near Pacific Street within the Alviso residential community. As shown in **Visual Resources Figure 14** in the Staff Assessment for the original AFC, the LECEF simple-cycle structures are hardly noticeable from KOP 3, and as such, the visual impacts of the project on this KOP were found to be less than significant. The Phase 2 additions to the facility would be barely perceptible from KOP 3, so the visual impacts of the new project would be less than significant from this viewing location.

Once all potential impacts are examined, staff makes the determination as to whether any impacts reach a significant level and thus require mitigation beyond that proposed by the applicant. Any required mitigation must be specific to an identified impact, and must be feasible.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

The proposed project is not located on federally administered public lands and therefore is not subject to federal regulations pertaining to visual resources.

STATE

None of the highways in the project vicinity, including SR 237 and Interstate 880 (I-880) are eligible or designated as State Scenic Highways. Therefore, no state regulations pertaining to scenic resources are applicable to the project.

LOCAL

The proposed project would be located in the City of San Jose within an area planned for industrial and public service land uses. The proposed project would be subject to local LORS pertaining to the protection and maintenance of visual resources which are found in the City of San Jose General Plan, the Alviso Master Plan, and the General Development Plan adopted as part of Ordinance No. 26579, which approved the Planned Development Zoning for the LECEF site. The pertinent sections of the general plan include the scenic routes and trails and pathways discussions under the chapter on Aesthetic, Cultural and Recreational Resources, and the discussion of urban throughways under Section V Land Use/Transportation Diagram. Relevant policies in the Alviso Master Plan are found in the Land Use Plan section under Land Use Policies, Design Guidelines, and Landscaping Policies. An assessment of the project's consistency with these applicable local LORS is discussed later in this analysis.

PROJECT DESCRIPTION

The following section describes the aspects of the proposed project that may have the potential to cause adverse impacts to visual resources. Please refer to the **PROJECT DESCRIPTION** section of the FSA for a more complete discussion of project details.

The most noticeable component of the Phase 2 project would be a new six-cell, plume-abated cooling tower. The proposed cooling tower would be 58 feet tall (to the top of the fan shrouds) and 289 feet long. Other noticeable new structures would include the steam drums that would be installed on top of the four existing 59-foot tall Heat Recovery Steam Generator (HRSG) casings and a 55-foot tall and 75-foot long steam turbine generator.

Except for the existing one-cell cooling tower, the LECEF power plant structures were painted gray to optimize their integration with the surrounding landscape and the sky. The proposed Phase 2 structures would also be painted or treated with a gray finish (LECEF, LLC 2003; AFC page 8.13-7). The existing one-cell cooling tower has beige-color treated fiberglass side panels. The raw water storage tank in the northeast quadrant of the project site is also painted beige.

The visible water-vapor (steam) plumes from both the cooling towers and exhaust stacks could have an adverse effect on visual resources in the vicinity of the project. Water vapor plumes are generally associated with heavy industrial land uses and thus tend to be regarded negatively by visually sensitive observers. The severity of the impact created by visible plumes depends on several factors, including the frequency of occurrence and physical sizes of the plumes, the sensitivity of the viewers who will see the plumes, the distance between the plumes and the viewers, the visual quality of the existing viewshed, and whether any scenic landscape features would be blocked by the plumes. Plume abatement technology would be installed on the new six-cell cooling tower to minimize the formation of visible plumes (LECEF, LLC 2003; AFC page 8.13-9). The extremely high temperature of the exhaust emitted from the LECEF stacks precludes the formation of visible plumes. However, because combined-cycle exhaust temperatures are much lower (due to the heat recovery by the HRSG units), visible plumes could be emitted from the LECEF Phase 2 stacks. The applicant has not proposed measures to abate the HRSG stack plumes. Staff's computer modeling and visual impact assessment of the Phase 2 cooling tower and HRSG plumes is presented later in this analysis.

The Phase 2 structures would require additional nighttime lighting for operational safety and security. The additional lighting would be designed to minimize offsite visual impacts (LECEF, LLC 2003; AFC page 8.13-9).

Construction of the proposed combined-cycle additions is anticipated to take 19 months. A 13-acre area south of the LECEF site is proposed to be used for storage of equipment and materials during construction. Construction equipment and materials would be visible to passing motorists on SR 237.

EXISTING SETTING

REGIONAL SETTING

The LECEF site is located in Santa Clara Valley, bordering the southern portion of San Francisco Bay. The Santa Clara Valley is defined by the Santa Cruz Mountain range to the south and west, the Diablo Mountain range to the east, and San Francisco Bay to the north. The landform of the valley floor is generally level and exhibits the visual characteristics of an environment transitioning from its historical agricultural use to that with a highly urbanized character, primarily defined by industrial, commercial, office, and residential development; infrastructure; and vegetation typical of landscaped urban parks and streetscapes. While some vestiges of the valley's historical agricultural activity remain, views within this urban environment are typically confined by, and encompass, built structures. Wetlands, sloughs, and diked salt ponds are located between the rapidly developing urban areas of the Santa Clara Valley and the expansive southern portion of San Francisco Bay.

PROJECT SITE AND VICINITY

The 21-acre LECEF site is located in the northern portion of the City of San Jose to the east of the community of Alviso. The LECEF site is north of SR 237, east of Zanker Road, west of Coyote Creek, and south of the San Jose/Santa Clara Water Pollution

Control Plant (WPCP) and associated lands. The site contains the LECEF simple-cycle structures, which include four combustion turbine generators and their associated exhaust stacks, four HRSG casings, a one-cell cooling tower, and an electrical switchyard. The site is surrounded on three sides by a decorative sound wall and landscaping. Immediately north of the LECEF site is the Silicon Valley Power (SVP) electrical switching station and the PG&E Los Esteros Substation. Further north are the settling ponds associated with the WPCP. Immediately west of the site, adjacent to Zanker Road are the WPCP buffer lands that have been used as hay fields. The LECEF plant access road (Thomas Foon Chew Way) traverses these lands and also provides access to the SVP Switching Station and PG&E's Los Esteros Substation. Additional buffer lands are located on the west side of Zanker Road, south of the WPCP. Further west, at a distance of approximately 1.7 miles is one of Alviso's residential neighborhoods (along Grand Boulevard). To the south of the site are SR 237 and technology business parks and Valley Transit Authority's Cerone bus maintenance facility on the south side of SR 237. To the east of the site is the riparian corridor of Coyote Creek and the McCarthy Ranch commercial and office development, which is situated between Coyote Creek and I-880 in the City of Milpitas.

There are two rural residences located on the agricultural property southeast of the LECEF site. These two residences, which are situated about 450 feet and 1,125 feet from the southeast corner of the LECEF site, are not oriented toward the project site and have mature landscaping that blocks views of the LECEF site. Although the resident population in the immediate project area is very low, the LECEF site is visible to large numbers of people who commute to and from work on SR 237. The two-direction Average Daily Traffic (ADT) volume on SR 237 is 143,000 vehicles per day (LECEF, LLC 2003).

VIEWING AREAS AND KEY OBSERVATION POINTS

Visual Resources Figure 1 (all of the visual resources figures are presented at the end of this analysis) shows the location and view direction of the two KOPs selected to characterize the existing visual setting within which the proposed project would be evaluated. The following paragraphs discuss the overall visual sensitivity at each KOP. Visual sensitivity takes into account existing landscape visual quality, viewer concern, and overall viewer exposure.

KOP 1: Eastbound SR 237 at Zanker Road

KOP 1 is located on the Zanker Road onramp to eastbound SR 237, approximately 0.25 mile southwest of the LECEF site. **Visual Resources Figure 2A** shows the current view of the LECEF site that is available to eastbound motorists on SR 237. The present view from KOP 1 in the direction of the LECEF site is dominated by the highway in the foreground and the East Bay Hills in the background. Other prominent features in the view are the LECEF itself, the landscaped berms installed by Calpine south and southwest of the site, and the electrical transmission lines and poles that parallel the north side of the highway. Although the East Bay Hills, including the 2,500-foot-high summit of Mission Peak, are a high quality landscape feature, the LECEF, highway, electrical transmission poles, and roadway signs all detract from the overall quality of the view. The visual quality of the view from KOP 1 toward the LECEF site is considered to be moderately low.

No residential viewers are represented by KOP 1, only commuters traveling east on SR 237. Because the attention of motorists' is primarily focused on navigating this busy section of roadway, and viewers have likely become accustomed to seeing energy infrastructure in this area, viewer concern regarding visual changes is considered moderately low.

The ADT for eastbound SR 237 is 71,500 vehicles per day so the number of potential viewers at KOP 1 is very high. From the First Street onramp to the Zanker Road overcrossing, the upper portions of the LECEF (mostly the stacks) are periodically visible to eastbound motorists on SR 237 when not blocked by buildings and trees along the highway. As eastbound motorists approach the Zanker Road overpass, the LECEF is completely blocked from view by the overpass structure and trees planted along the off-ramp to Zanker Road from westbound SR 237. After passing underneath the Zanker Road overpass (just west of the KOP 1 viewpoint), the LECEF comes into full view and is visible for 20 seconds or more while driving passed it at 55 to 60 MPH. Passengers are free to view the LECEF for the full 20 seconds or so, but drivers can only occasionally glance over at the power plant through their side windows, as their attention would be focused straight ahead down the highway as they navigate their cars along this heavily traveled thoroughfare. The landscaped berms that Calpine installed southwest and south of the LECEF site currently screen only small portions of the facility. Overall viewer exposure (which takes into account the number of viewers and the visibility and duration of their view) in the area of KOP 1 is considered moderately high.

For KOP 1, the moderately low visual quality, moderately low viewer concern, and moderately high viewer exposure result in an overall visual sensitivity rating of moderate.

KOP 2: Zanker Road

KOP 2 is located on Zanker Road approximately 0.38 mile west of the project site and about 0.4 mile north of SR 237. **Visual Resources Figure 3A** shows the current view of the LECEF site as seen from this viewpoint along Zanker Road. Prominent existing features in the view from KOP 2 are the WPCP buffer lands in the foreground (which are covered with wild mustard plants in the spring); the LECEF, PG&E Los Esteros Substation, the SVP Switching Station (not visible in **Figure 3A** as construction had not started when the photograph was taken) and electrical transmission lines in the middleground; and the East Bay Hills in the background. The power plant and substation have substantially changed the formerly rural character of the view from KOP 2, and disrupt the view of the East Bay Hills. Overall visual quality is moderately low at KOP 2.

KOP 2 does not represent any residential views, only views of motorists traveling on Zanker Road. Motorists on Zanker Road, who may work in the area or are using the road to access the neighborhood of Alviso or the Don Edwards San Francisco Bay National Wildlife Area, would likely anticipate seeing public service infrastructure in this area of San Jose, such as the Los Esteros power plant and electrical substation, a wastewater treatment plant, and a landfill. The City of San Jose has planned the area

for industrial and public service uses. For KOP 2, viewer concern regarding visual changes is moderately low.

According to the AFC, Zanker Road has an estimated ADT of approximately 5,000 vehicles per day, which is very low compared to the traffic counts on SR 237 (KOP 1). The LECEF is highly visible from KOP 2 because the intervening land is open, and undeveloped. However, the view shown in the **Visual Resources Figure 3A** is not a view that would typically be seen by motorists driving along Zanker Road. The photograph used in the figure was taken from the side of the road looking directly at the LECEF site. In reality, the LECEF is peripheral to Zanker Road and outside the primary cone of vision (which is 45 degrees of the centerline of the direction of travel) for both northbound and southbound motorists on the road. Overall viewer exposure at KOP 2 is moderate.

For KOP 2, the moderately low visual quality and viewer concern, and the moderate viewer exposure result in an overall visual sensitivity rating of moderately low.

IMPACTS

The following discussion of project impacts is organized around the four questions in the Environmental Checklist (Appendix G of the CEQA Guidelines).

SCENIC VISTAS

The first checklist question is: Would the project have a substantial adverse effect on a scenic vista? Views of Mission Peak and the East Bay Hills are possible from SR 237 and Zanker Road, which are represented by KOPs 1 and 2, respectively. The existing LECEF structures block views of a small portion of the East Bay Hills. The Phase 2 structures would increase the amount of view blockage of the East Bay Hills, but not substantially. As seen from the areas of KOPs 1 and 2, the Phase 2 structures would not disrupt the ridgeline of the East Bay Hills. Thus, staff concludes that LECEF 2, Phase 2 would cause a less than significant impact under this criterion. The landscaped berms south and southwest of the LECEF site and the plantings along the site boundaries were designed with the intent of substantially screening the LECEF over time without blocking the ridgeline of the East Bay Hills.

SCENIC RESOURCES

The second checklist question asks: Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway corridor? The LECEF site does not contain rock outcroppings or historic buildings and has almost completely been built out with power plant structures. The landscaping at the LECEF site was installed to mitigate the impact of the LECEF structures and would remain after installation of the Phase 2 structures. As mentioned earlier in the LORS section, there are no state designated scenic highways within the project viewshed. Although SR 237 is a City-designated Landscape Throughway, it is not a state-designated scenic route. Therefore, the project would have no impact under this criterion.

VISUAL CHARACTER OR QUALITY

The third CEQA checklist question is: Would the project substantially degrade the existing visual character or quality of the site and its surroundings? The project aspects that were evaluated under this criterion include project construction, the combined-cycle structures, and visible water vapor plumes.

Project Construction

The area south of the LECEF site and north of SR 237 would be used during project construction for storage of equipment and materials and for parking by construction personnel. Construction activities would cause temporary visual impacts due to the presence of equipment, materials, and workforce. Construction of the combined-cycle additions is expected to last for 19 months. The visual impacts of construction would be less than significant because: the visual disturbances would be temporary; construction activities would be barely visible from any residential area and only briefly visible to passing motorists on SR 237 and Zanker Road; the landscaped berms would provide partial screening of construction activities and equipment; and because the existing visual quality of the site as seen from SR 237 and Zanker Road is moderately low. Condition of Certification **VIS-1** from the LECEF Commission Decision requires restoration of areas disturbed by construction to prevent these areas from becoming sources of long term visual impacts. Staff believes that the requirement to visually screen staging and storage areas can be deleted from VIS-1 because the berms would partially screen views of construction activities and existing visual quality is moderately low. In addition, the requirement to restore pipeline rights-of-way can be deleted because the Phase 2 project does not involve construction of any pipelines.

In the event that construction activities occur at night, condition **VIS-4** would require Calpine to implement measures to minimize the offsite visibility of any construction lighting. VIS-4 requires temporary construction lighting to be hooded, shielded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and light trespass. These mitigation measures would ensure that construction lighting impacts, if they occur, are kept to less than significant levels.

Combined-Cycle Power Plant Additions

The most noticeable component of Phase 2 would be a new six-cell, plume-abated cooling tower. The proposed cooling tower would be 58 feet tall (to the top of the fan shrouds) and 289 feet long. Other noticeable new structures would include the steam drums that would be installed on top of the four existing 59-foot tall HRSG casings and the 55-foot tall, 75-foot long steam turbine generator. Phase 2 would also include a short, 200-foot long overhead transmission line to interconnect the existing LECEF switchyard to the SVP Switching Station that was built on the land between the LECEF site and the PG&E Los Esteros Substation. Once the interconnection with the SVP Switching Station is completed, the existing aboveground transmission line connecting the LECEF to a PG&E transmission line immediately west of the power plant site would be removed (LECEF, LLC 2003; page 5-2).

A detailed analysis of the visual impacts of the combined-cycle structures was conducted for each KOP and is presented below.

KOP 1: Eastbound SR 237 at Zanker Road

KOP 1 is located on the Zanker Road onramp to eastbound SR 237, approximately 0.25 mile southwest of the LECEF site. As discussed earlier, the present view from KOP 1 in the direction of the LECEF site is dominated by the highway in the foreground and the East Bay Hills in the background. The LECEF, landscaped berms, and electrical transmission lines and poles are prominent features in the middleground of the view. The existing view is considered to be of moderately low visual quality. **Visual Resources Figure 2B** presents a visual simulation of the Phase 2 LECEF as it would be seen from KOP 1.

As seen from KOP 1, the proposed project would add the prominent rectilinear form of the six-cell cooling tower. From KOP 1, the new cooling tower would block much of the existing LECEF structures from view. The piping and steam drums that would be installed on the HRSG casings would be partially obscured by the new tower and would not be particularly noticeable from this viewpoint. Although it would be larger, the proposed six-cell tower would appear similar in form and line to the existing one-cell tower. The simple, horizontal form of the lower portion of the cooling tower structure would cause a low degree of contrast with the simple, horizontal forms of the highway, median barrier, and the rolling, horizontal form of the East Bay Hills in the background. The six cone shapes (fan shrouds) at the top of the tower, although similar to the one on the existing tower, would contrast highly with other landscape forms. The proposed gray color would cause a low degree of contrast with the gray colors of the pavement and median barrier, and would contrast moderately with the seasonally changing colors (green in the winter and spring, and brown in the summer and fall) of the East Bay Hills. Overall, visual contrast with the existing setting would be moderate.

The existing view from KOP 1 is dominated by the highway in the foreground and the East Bay Hills in the background. Although larger than the existing LECEF structures and more massive than other built structures in the view, such as the power poles, the new cooling tower would be subordinate to the East Bay Hills and the expanse of roadway. The six-cell tower would occupy a moderate part of the view from KOP 1 toward the LECEF site. The hill backdrop and the project's location at the edge of motorists' primary view direction reduce the dominance rating of the cooling tower. Overall, the dominance rating of the new cooling tower would be moderate.

The six-cell cooling tower would block most of the existing power plant from view as well as a small portion of the lower slopes of the East Bay Hills. The view of the portion of the hills that would be blocked is already compromised by power poles and other structures. Views of the upper slopes and the ridgeline would be unaffected. The severity of the view blockage is considered moderately low.

From KOP 1, the overall visual change caused by the LECEF Phase 2 would be moderate due to the moderate degree of contrast and dominance, and the moderately low degree of view blockage. When considered within the context of the moderate visual sensitivity of the existing landscape, the moderate degree of visual change that would be perceived from the area of KOP 1 would not substantially degrade existing visual quality, and therefore would result in an adverse but less than significant visual impact. The adverse impacts of Phase 2 would be reduced as the landscaping on the

berms and along the site perimeters matures and substantially screens the power plant structures from view (see **Visual Resources Figure 2C**). Staff is proposing new language for condition **VIS-3** to ensure that the landscaping and berms are maintained for the life of the project.

KOP 2: Zanker Road

KOP 2 is located on Zanker Road approximately 0.38 mile west of the project site and about 0.4 mile north of SR 237. Prominent existing features in the view from KOP 2 are the WPCP buffer lands in the foreground (which are covered with wild mustard plants in the spring); the LECEF, PG&E Los Esteros Substation, the SVP Switching Station, and electrical transmission lines in the middleground; and the East Bay Hills in the background. Present visual quality is rated moderately low at KOP 2. **Visual Resources Figure 3B** presents a visual simulation of the proposed project as it would be seen from KOP 2.

As seen from KOP 2, the most noticeable change to the view would be the addition of the prominent rectilinear form of the six-cell cooling tower. The geometric shapes of the proposed cooling tower would be similar to the forms of the existing LECEF structures but would contrast highly with the flat fields in the foreground and the simple, horizontal form of the East Bay Hills. The straight lines of the project would be similar to the straight lines of the existing LECEF structures, power poles and electrical substation structures, and fields, but contrast moderately with undulating line of the ridgeline. The gray color of the new cooling tower would contrast moderately with the seasonally changing colors of the field and hills. Overall, visual contrast would be moderate.

The new cooling tower would appear comparable in size to the existing LECEF structures and would be subordinate to the expansive field in the foreground and the East Bay Hills in the background. The proposed cooling tower would occupy a small portion of the panoramic view available at KOP 2. The hill backdrop and the project's location outside motorists' primary view direction reduce the dominance rating of the cooling tower. Overall, the dominance rating of the new cooling tower is subordinate.

The proposed cooling tower would increase the amount of the East Bay Hills blocked by the LECEF. The severity of the additional view blockage is considered low because the view to this portion of the East Bay Hills from Zanker Road is outside motorists' primary view direction.

From KOP 2, the overall visual change caused by the Phase 2 LECEF would be moderately low due to the moderate degree of contrast and low degrees of dominance and view blockage. When considered within the context of the moderately low visual sensitivity of the existing landscape, the moderately low degree of visual change that would be perceived from the area of KOP 2 would not substantially degrade existing visual quality, and therefore would result in an adverse but less than significant visual impact.

Cooling Tower and Combustion Exhaust Plumes

The existing LECEF includes a one-cell cooling tower equipped with the Marley Clear Flow plume abatement system. This abatement system was installed for compliance

with City of San Jose Ordinance 26343, which required implementation of the best commercially available technology for minimizing plumes (see condition **VIS-6**). Conversion of the LECEF to a combined-cycle facility would require the addition of a six-cell cooling tower to remove heat from the circulating water system and the steam turbine generator coolers. The new cooling tower would also use plume abatement technology. The existing one-cell tower would remain in operation to provide cooling for the facility's auxiliary systems. While the extremely high temperature of the exhaust emitted from the LECEF stacks precludes the formation of visible water vapor plumes, converting the facility to combined-cycle would reduce the turbine/HRSG exhaust temperature, thereby creating the potential for plumes to be emitted from the LECEF Phase 2 exhaust stacks, particularly during peaking operations when the moisture content of the exhaust increases. Calpine is not proposing any measures to minimize the HRSG exhaust plumes.

Energy Commission staff performed a psychrometric and plume modeling analysis of the abated cooling tower and unabated turbine/HRSG exhausts to predict how frequent the Phase 2 water vapor plumes are expected to occur (Walters, 2004; see **Appendix VR-2** at the end of this section of the FSA). Staff focuses its analysis on the portion of the year when the ambient conditions (i.e., temperature and relative humidity) are such that plumes are most likely to occur (typically November through April) and when "clear" sky conditions are present because this is when the plumes would cause the most visual contrast and have the greatest potential to cause adverse visual impacts. Staff typically eliminates from consideration plumes that occur at night or during rain or fog conditions because plume visibility, and overall visual quality, is typically low during those conditions. In addition, plumes that occur during specific cloudy conditions are also eliminated because under these conditions, plumes have less contrast with the background sky. For this project the meteorological data set used in the analysis categorizes total sky cover and opaque sky cover in 10 percent increments. Staff has included in the "Clear" category a) all hours with total sky cover equal to or less than 10 percent plus b) half of the hours with total sky cover 20-100 percent that have sky opacity equal to or less than 50 percent. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with the sky under clear conditions and, when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100 percent and the opacity of sky cover is relatively low (equal to or less than 50 percent), clouds do not substantially reduce plumes' contrast with the sky; staff has estimated that approximately half of the hours meeting the latter sky cover and sky opacity criteria can be considered high visual contrast hours and are included in the "clear" sky definition.

Cooling Tower Plumes

Staff predicted the plume-abated cooling tower plume frequency by screening a six-year meteorological data set (SFO 1990-1996) against the fogging frequency curves Calpine provided for the cooling tower to determine the number of hours where the ambient conditions would be above the tower's fogging frequency design curves. Hours with ambient conditions above the curve were assumed to have a visible plume and hours with ambient conditions below the curve were assumed not to have a visible plume.

Visual Resources Table 1 provides the predicted plume frequencies for the plume-abated cooling tower. As shown in the table below, the analysis estimates that the cooling tower plumes would occur less than two percent of seasonal daylight clear hours during base load operation, and less than five percent of seasonal daylight clear hours when peaking. Peaking operations would be limited to 1,250 hours per year (LECEF, LLC 2003) and would likely occur in the summer peak demand period; therefore, the operating plume frequency for seasonal daylight clear hours would be expected to be much closer to that predicted for the base load case than the peaking case. Using a linear averaging approach, staff estimates that the actual abated cooling tower plume frequency would be approximately 2.16 percent of seasonal daylight clear hours, which translates to about 18 hours per seasonal daylight clear period per year. Based on the psychrometric analysis performed, staff concludes that the applicant's proposed abatement system is very effective at minimizing plumes. Therefore, due to their very low frequency, the Phase 2 abated cooling tower plumes would result in less than significant visual impacts. Staff has modified **VIS-6** to address plume-abatement for the Phase 2 six-cell cooling tower and to ensure that the cooling towers are operated so that visible plumes are abated to the maximum extent possible for the specific design points of the two towers. New language has been added to require annual reporting to document that plumes were mitigated to the maximum extent possible.

Visual Resources Table 1
Staff Predicted Hours with Cooling Tower Steam Plumes
SFO 1990-1996 Meteorological Data

Period	Available (hr)	Base Load		Peaking	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,583	4,026	7.66%	10,725	20.40%
Daylight Hours	26,843	785	2.92%	2,113	7.87%
Nighttime Hours	25,740	3,241	12.59%	8,612	33.46%
Daylight NRNF	24,694	297	1.20%	1,051	4.26%
Seasonal DNRNF*	10,354	232	2.24%	726	7.01%
Seasonal Daylight Clear*	4,496	85	1.72%	240	4.85%

*Seasonal conditions occur anytime from November through April.

Turbine/HRSG Exhaust Stack Plumes

Staff used the Combustion Stack Visible Plume (CSVP) model to estimate plume frequency for the turbine/HRSG exhausts. This model uses both hourly exhaust parameters and hourly ambient condition data to predict plume frequency. The six-year meteorological data set from San Francisco International Airport (SFO) was used in this modeling analysis. The plume frequency module of the CSVP model is based on an algorithm that determines whether the plume, as it mixes with the given ambient air condition, will cross the air/water vapor saturation curve. If the saturation curve is crossed a supersaturated condition is predicted to occur, and water vapor condensation and the formation of a visible plume is assumed.

Visual Resources Table 2 provides the CSVP modeling results for the HRSG plumes. As shown in the table below, the modeling analysis estimates that the HRSG plumes would occur 3.34 percent of seasonal daylight clear hours during base load operation, and 13.34 percent of seasonal daylight clear hours during peaking load operation. Peaking operations would be limited to 1,250 hours per year and would likely occur in

the summer peak demand period; therefore, the operating plume frequency for seasonal daylight clear hours would be expected to be much closer to that predicted for the base load case than the peaking case. Using a linear averaging approach, staff estimates that the actual HRSG plume frequency would be approximately 4.77 percent of the seasonal daylight clear hours, which translates to about 39 hours per seasonal daylight clear period per year. Because the LECEF Phase 2 unabated HRSG plumes would occur so infrequently they would result in less than significant visual impacts. At the Data Response and Issues Resolution Workshop held by Energy Commission staff on May 19, 2004, City of San Jose Planning staff indicated that because of the infrequency of the exhaust plumes no technological mitigation measures would be necessary for the HRSGs to meet LORS.

Visual Resources Table 2
Staff Predicted Hours with HRSG Steam Plumes
SFO 1990-1996 Meteorological Data

Period	Available (hr)	Base Load		Peaking	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,583	4,216	8.02%	16,059	30.54%
Daylight Hours	26,843	744	2.77%	3,349	12.48%
Nighttime Hours	25,740	3,472	13.49%	12,710	49.38%
Daylight NRNF	24,694	347	1.41%	2,117	8.57%
Seasonal DNRNF*	10,354	333	3.22%	1,697	16.39%
Seasonal Daylight Clear*	4,946	165	3.34%	660	13.34%

*Seasonal conditions occur anytime from November through April.

LIGHT OR GLARE

The fourth CEQA checklist question asks: Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area? The existing LECEF is a source of nighttime lighting at the project site. The LECEF light fixtures are equipped with hoods/shields to minimize offsite lighting impacts and prevent direct illumination of the night sky. Because the lights are shielded and many are not turned on at night unless needed for inspections or maintenance, the LECEF site appears quite dark at night when viewed from the surrounding area. Other sources of lighting in the vicinity of the LECEF site and visible from KOPs 1 and 2 include roadway lights along SR 237 and Zanker Road and lights at the PG&E Los Esteros Substation and at facilities south of SR 237.

The Phase 2 additions to the LECEF would require nighttime lighting for operational safety and security. Calpine would design the new lighting consistent with the existing LECEF lighting to minimize offsite visual impacts. Therefore, Phase 2 would not be a source of substantial new light or glare that could adversely affect nighttime views. Condition **VIS-4** requires Energy Commission staff review and approval of a lighting plan for the project and an inspection after installation to ensure effective implementation of Calpine's proposed lighting control measures.

Calpine proposes to paint/treat the Phase 2 structures gray like the majority of the existing LECEF structures. The semi-gloss finish on the existing LECEF structures does not create substantial daytime glare. Aluminum lagging on pipes at the LECEF is the corrugated variety intended to reduce glare. Thus, staff concludes that the Phase 2 structures would not be a source of substantial glare that could adversely affect daytime

views in the project area. Condition **VIS-2** requires staff review and approval of a surface treatment plan for the Phase 2 structures.

CUMULATIVE IMPACTS

As defined in Section 15355 of the CEQA Guidelines (Cal. Code Regs., tit. 14), a cumulative impact is created as a result of the combination of the project under consideration together with other existing or reasonably foreseeable projects causing related impacts. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. In other words, though any one project in a given area may not create a significant impact to visual resources, the combination of the new project with all existing or planned projects in the area may create significant impacts. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; or (3) visual quality is diminished.

The Commission found the cumulative visual impacts of the LECEF with past, present, and reasonably foreseeable projects known at the time to be less than significant with mitigation. To reduce cumulative visual impacts to a less than significant level, the Commission required the installation of landscaping. The Phase 2 structures would be screened by the landscaping that was planted on the buffer land berm and along the boundaries of the LECEF site so the cumulative visual impacts of the LECEF would remain less than significant. The SVP Switching Station was completed in December of 2004 in the narrow strip of land between the LECEF and the PG&E Los Esteros Substation. As such it is not particularly noticeable to motorists on SR 237. Furthermore, the LECEF berm, landscaping, and structures block views of the switching station from some vantagepoints along SR 237. The SVP Switching Station is more visible from Zanker Road, but like the LECEF, it is not within the primary view direction of motorists. For these reasons, staff concludes that the LECEF Phase 2 and the SVP Switching Station would not combine together to produce significant cumulative visual impacts.

The panoramic view from the Alviso neighborhood along Grand Boulevard west of the LECEF site contains approximately 6-8 visible water vapor plumes emanating from sources south of SR-237. The most prominent of these plumes and the one closest to the proposed project is the plume from Calpine’s Agnews Cogeneration Plant located approximately 0.9 mile south of the LECEF site. Because the Phase 2 HRSG plumes and abated cooling tower plumes would occur very infrequently, the resulting adverse cumulative visual impact experienced from Alviso would not be significant, particularly when viewed at a distance of 1.7 miles away.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LOCAL

The proposed project would be located in the City of San Jose and therefore would be subject to local LORS pertaining to the protection and maintenance of visual resources, which are found in the City of San Jose General Plan, the Alviso Master Plan, and the General Development Plan adopted as part of Ordinance No. 26579, which approved the Planned Development Zoning for the LECEF site. The pertinent sections of the general plan include the scenic routes and trails and pathways discussions under the chapter on Aesthetic, Cultural and Recreational Resources, and the discussion of urban throughways under Section V. Land Use/Transportation Diagram. Relevant policies in the Alviso Master Plan are found in the Land Use Plan section under Land Use Policies, Design Guidelines, and Landscaping Policies. With implementation of the visual resources conditions of certification adopted by the Energy Commission, the Commission found the LECEF consistent with all applicable policies and guidelines related to visual resources found in the San Jose General Plan and Alviso Master Plan. **Visual Resources Table 3** presents staff's assessment of the LECEF Phase 2 combined-cycle project's consistency with applicable local LORS. Staff believes condition **VIS-7**, which was adopted for the purpose of ensuring that the original LECEF project complied with General Plan, Scenic Routes Policy 4, should be deleted (shown in strikethrough format) for the reasons explained below.

Visual Resources Table 3
Consistency with City of San Jose LORS

LORS		
Source	**Objective and Policy Descriptions**	**Consistency Determination**
General Plan; Community Development; Urban Design	Policy 2: Private development should include adequate landscape areas. Landscape areas should utilize water efficient plant materials and irrigation systems. All landscape areas should include provision for ongoing landscape maintenance.	**Yes.** The west, south, and east boundaries of the LECEF site have already been extensively landscaped. In addition, a landscaped berm was installed southwest of the site. No additional landscaping has been proposed for Phase 2. Some of the tree species that were planted are drought tolerant. The LECEF landscape areas are irrigated with reclaimed water. Staff is proposing modifications to Condition of Certification **VIS-3** to require routine maintenance of the landscape areas for the life of the LECEF Phase 2 project.
	Policy 17: Development adjacent to creekside areas should incorporate compatible design and landscaping including plant species which are native to the area or are compatible with native species.	**Yes.** Landscaping was planted along the west, south, and east sides of the LECEF site, and on a large berm southwest of the site. The following trees were planted in these areas: coast redwood, river she-oak, shamel ash, cajeput, California sycamore, and coast live oak. Of these, the redwood, sycamore, and oak are native to California. And of these, the sycamore and oak are found in the Coyote Creek riparian area. The non-native trees in the landscape areas are compatible with native species found in the area.
	Policy 18: Where sound attenuation walls are deemed necessary, landscaping and an aesthetically pleasing design shall be used to minimize visual impact.	**Yes.** An eight-foot tall, masonry block sound wall was installed on the west, south, and east sides of the LECEF site. The wall has a textured surface and is adorned with a 4-foot tall decorative redwood lattice fence along its top. Shrubs and tall

Visual Resources Table 3
Consistency with City of San Jose LORS

LORS		
Source	**Objective and Policy Descriptions**	**Consistency Determination**
		growing trees have been planted on the outside of the wall.
General Plan; Aesthetic, Cultural, and Recreational Resources; Scenic Routes	Policy 1: Development within the designated Rural Scenic Corridors and along designated Landscaped Throughways should be designed with the intent of preserving and enhancing attractive natural and man-made vistas.	**Yes.** SR 237 is a designated Landscaped Throughway. The landscaping surrounding the LECEF has been designed so it will substantially screen the power plant structures but will not block sightlines from KOP 1 of the distant ridgelines of the north trending East Bay Hills. The new cooling tower structure would block a small portion of the East Bay Hills; however, the portion of the hills that would be blocked by the new structure is already compromised by existing development. The new Phase 2 structures would not disrupt views of the ridgeline of the East Bay Hills as seen from public viewpoints.
	Policy 4: Any development occurring adjacent to Landscape Throughways should incorporate interesting and attractive design qualities and promote a high standard of architectural excellence.	**Yes.** An Architectural Review Committee, which included representatives of the cities of San Jose and Milpitas, was established to ensure the LECEF's compliance with Policy 4 (see condition **VIS-7**). The committee did not recommend any architectural treatment on the existing structures themselves, but rather recommended installation of two large landscaped berms to the south and southwest of the LECEF site, which Calpine installed at the end of 2003. Staff inspected the completed landscaping and found that it was installed consistent with the landscape plans approved by the Energy Commission Compliance Project Manager. The landscaping planted on the berms and around the LECEF site will substantially screen the LECEF Phase 2 project structures when it matures. As such, staff does not believe there is a need, as VIS-7 requires, to "continue to confer with the cities of San Jose and Milpitas to consider additional aesthetic changes" to ensure the project's compliance with Policy 4. To avoid confusion as to whether it is necessary to "continue to confer" with the local agencies, staff believes condition **VIS-7** should be deleted (shown in strikethrough format). Calpine proposes to treat the new six-cell cooling tower and the other Phase 2 structures in a gray color to match the existing LECEF power plant structures, and to blend with the sky (as seen from westbound SR 237) and the hills (which change in color seasonally from green to brown and often appear grayish due to haze). The plume abatement air intake vents would break up the otherwise uniform façade of the new cooling tower. The decorative sound wall and the extensive landscaping are interesting and attractive features at the LECEF site.
	Policy 5: Any development along Landscaped Throughways entering the City should be designed to provide attractive gateways to the City.	**Yes.** The LECEF is visible briefly to westbound motorists on SR 237 as they enter San Jose from neighboring Milpitas. Although most people would not consider the existing LECEF structures and the proposed cooling tower to be "attractive," as required by **VIS-2**, all of the LECEF structures will be repainted or retreated as necessary to maintain

Visual Resources Table 3
Consistency with City of San Jose LORS

LORS		
Source	**Objective and Policy Descriptions**	**Consistency Determination**
		a high-quality appearance for the life of the project. The new cooling tower would be treated in a gray color similar to the existing power plant to maximize its integration with the environment. The decorative sound wall and landscaping are attractive features visible to motorists entering the City of San Jose that enhance the overall appearance of the project.
General Plan; Aesthetic, Cultural, and Recreational Resources; Trails and Pathways	Policy 1: The City should control land development along designated Trails and Pathways Corridors in order to provide sufficient trail right-of-way and to ensure that new development adjacent to the corridors does not compromise safe trail access nor detract from the scenic and aesthetic qualities of the corridor.	**Yes.** The sound wall, berm, and tall growing trees will partially screen views of the project structures from the proposed Bay Trail alignment along Coyote Creek.
General Plan; Scenic Routes and Trails Diagram; Scenic Routes	Landscaping in Urban Throughways should be used to supplement and enhance adjacent land. Landscaping along these thoroughfares will provide a foreground framework or a clearing for longer distance views, and will also screen unsightly views or uncharacteristic land uses.	**Yes.** The landscaping that has been installed on and offsite will in time substantially screen the proposed cooling tower and the existing LECEF structures. The landscaping was designed so at maturity it will not block views of the distant ridgeline of the East Bay Hills as seen from SR 237.
	Commercial and industrial development adjacent to Urban Throughways should be attractive and have a high quality of architectural design. These developments should be sufficiently spaced to preserve the scenic character of the thoroughfare.	**Yes.** Upon recommendation of the Architectural Review Committee, landscaped berms were installed to improve the appearance of the LECEF. The committee did not recommend any architectural treatment on the existing LECEF structures themselves. The new cooling tower would be treated in a gray color to maximize its integration with the environment. In time, the landscaping will substantially screen the tower. The Phase 2 additions are being built within the existing fenceline of the LECEF site. The land surrounding the LECEF access road (Thomas Foon Chew Way) is to be maintained as a landscaped buffer area, and the remaining land west of the site and east of Zanker Road, as well as land west of Zanker Road are open WPCP buffer lands, all of which provide a clearing for views to the surrounding area.
Alviso Master Plan; Land Use Policies	Industrial/Non Industrial Relationships Policy 2: The light industrial areas located north of State Street and adjacent to Coyote Creek should mitigate potential negative environmental impacts to nearby natural resources.	**Yes.** The new six-cell cooling tower is located over 1,600 feet away from the Coyote Creek corridor. The sound wall, berm, and tall growing trees would partially screen views of the new structure from the proposed future Bay Trail along the creek.
	Gateway Entrances Objective: Development located near Highway 237 along both sides of Gold Street, First Street, and Zanker Road should foster a “gateway” feel through building orientation, signs, trees, landscaping, and other features.	**Yes.** The LECEF is visible briefly to westbound motorists on SR 237 as they enter San Jose from neighboring Milpitas. Tall growing trees and a decorative sound wall were installed around the boundaries of the LECEF. Upon recommendation of the Architectural Review Committee, two large landscape berms were installed south and southwest of the site to screen views of the LECEF from eastbound and westbound SR 237.

Visual Resources Table 3
Consistency with City of San Jose LORS

LORS		
Source	**Objective and Policy Descriptions**	**Consistency Determination**
		The committee did not recommend any architectural treatment on the existing LECEF structures, and none is proposed by Calpine for the Phase 2 structures. The most noticeable new structure, the six-cell cooling tower would be treated in a gray color similar to the existing power plant to maximize its integration with the environment.
Alviso Master Plan; Design Guidelines; Lands Outside of the Village Area	Design Objective: Given the high visibility of most of this area, development should be attractive; should fit in the context of the larger community; and should reflect some of the elements and materials of seaside styles to contribute to Alviso's sense of place.	**Yes.** While the Phase 2 structures themselves would not be considered "attractive" by most people, all of the LECEF structures will be repainted or retreated as necessary to maintain a high-quality appearance for the life of the project. The decorative sound wall and extensive landscaping improve the appearance of the LECEF. While none of the existing or proposed LECEF structures incorporate seaside styles characteristic of the community of Alviso, some native trees found in the Coyote Creek riparian area have been incorporated into the project's landscaped areas. The project does fit into the context of the other public service infrastructure characteristic of the area.
Alviso Master Plan; Design Guidelines; Lands Outside of the Village Area; Industrial Development	Development Standards – Parking: The majority of the surface parking area for any industrial development should be located at the side and/or rear of the building. Parking areas adjoining the street should be screened by the placement of trees, a low hedge or a wall within the front setback area.	**Yes.** No additional parking areas are proposed for Phase 2. The existing LECEF parking area is located south of the office and control buildings, which are located north of the power generation equipment. The parking area is not visible from offsite because it is screened by the sound wall, landscaping, and the power plant structures.
Alviso Master Plan; Landscaping Policies	Landscaping Policy 1: Landscaping should make a strong connection between the natural and built environment and preserve Alviso's existing character.	**Yes.** The LECEF site is located about 1.7 miles east of the community of Alviso and about 700 feet west of densely vegetated Coyote Creek riparian area. The project site has been extensively landscaped using some California native trees that are found in the Coyote Creek riparian area.
	Landscaping Policy 2: Landscaping should be simple and minimal to reflect Alviso's open character. a)…Trees should be used sparingly to maintain the open views of Alviso.	**Yes.** While much of the area between the community of Alviso and the LECEF site is open and sparsely vegetated, the project site is about 700 feet west of the Coyote Creek riparian area, which is densely vegetated with typical native riparian vegetation including Fremont cottonwood, red willow, box elder, coast live oak, arroyo willow, western sycamore, and black walnut. The LECEF landscaping includes some of these native trees and other riparian trees to reflect the character of the Coyote Creek vegetation.
	Landscaping Policy 3: Landscaping should be used to screen unattractive uses and soften the effect of taller buildings due to the flood protection requirements.	**Yes.** In time, the tall growing trees on the berms and around the site boundaries will substantially screen the existing LECEF and Phase 2 structures.
	Landscaping Policy 4: Landscaping should not block views of the rivers, natural riparian areas, or marshlands.	**Yes.** The LECEF landscaping partially obstructs views of the Coyote Creek riparian area. Views of the riparian area are still possible from various points along SR 237 and Zanker Road. Project landscaping includes several California native

Visual Resources Table 3
Consistency with City of San Jose LORS

LORS		
Source	**Objective and Policy Descriptions**	**Consistency Determination**
		trees, including species found in the riparian area.
	Landscaping Policy 7: To the extent feasible, major new landscaping should be irrigated with reclaimed water from the Water Pollution Control Plant.	**Yes.** The LECEF landscaped areas are irrigated with reclaimed water from the WPCP.
San Jose Ordinance No. 26579; General Development Plan; Development Standards	I. Building Height: The maximum building height shall conform to the General Plan. Auxiliary structures, including but not limited to, towers and communications devices shall not exceed 100 feet in height, or as allowed by the General Plan.	**Yes.** Urban Design Policy 10 of the General Plan states that building height should not exceed 50 feet. No new buildings are proposed for Phase 2. None of the proposed Phase 2 structures would exceed the structural height limitation of 100 feet. The existing HRSG stacks are 90 feet tall. The proposed combined-cycle modifications to the HRSG casings, such as the steam drums and relief valves and silencers, would extend to a height of 71 feet and 88 feet from grade, respectively. The proposed six-cell cooling tower would be 58 feet tall, and the proposed steam turbine generator would be 55 feet tall.
San Jose Ordinance No. 26579; General Development Plan; VIII. Environmental Mitigations; H. Visual Resources	2. All new industrial development will comply with the City's Industrial Design Guidelines, which state that structures and activities should be located and designed to avoid creating nuisances and hazards for adjoining properties. The Industrial Design Guidelines also provide that lighting levels should not spill onto adjacent properties.	**Yes.** Lights needed for the Phase 2 structures would be designed similar to the existing LECEF fixtures to minimize offsite impacts. Existing lights are hooded/shielded to minimize direct light trespass and prevent direct illumination of the night sky. Many of the lights, such as those on the upper levels of the facility, are on switched circuits and kept off at night unless needed for nighttime maintenance and routine inspections by plant operators. Direct light is visible from immediately outside the project boundary given the high location of some of the fixtures on the taller structures. However, the property to the west of the site is undeveloped WPCP buffer lands that are not publicly accessible, and the property to the east is an agricultural field. The PG&E Los Esteros Substation to the north has some unshielded lights. From public viewpoints, direct light is not visible from the hooded/shielded LECEF light fixtures.
	3. … taller buildings will be located farther from the residential neighborhood and closer to SR 237. To the extent feasible, landscape plant materials will be native, wind tolerant, relatively fast growing and require little care. Landscaping will be used to soften the effect of taller buildings.	**Yes.** The project, which includes a 58-foot tall cooling tower, is located about 1.7 miles east of the residential community of Alviso and about 700 feet north of SR 237. The landscaping includes several tree species that are native to California. The coast live oak and cajeput tree are moderate growers. The shamel ash, sycamore, and coast redwood are fast growers and the river she-oak is a moderately fast grower. Except for cajeput, which grows to 30 to 40 feet tall, all of the trees will grow to a maximum height of 60 feet or more. The coast redwoods could grow 90 feet tall. Over time, the trees would soften the effect of the proposed 58-foot tall six-cell cooling tower.
	4. Small equipment within the energy facility will be placed within enclosures as appropriate.	**Yes.** Small equipment at the LECEF has been placed within enclosures. The 12-foot perimeter wall also screens the small equipment from view. The proposed steam turbine would be in an enclosure. Although the lower portion of the six-cell cooling tower would be open, the upper portion would be enclosed.

Visual Resources Table 3
Consistency with City of San Jose LORS

LORS		
Source	**Objective and Policy Descriptions**	**Consistency Determination**
	5. Landscape berms surrounding the site will be put in place to partially shield views of the project from SR 237 and the proposed Bay Trail alignment. The Coyote Creek Trail may be located at the top of the existing Coyote Creek by-pass levee and shielding would be less effective.	**Yes.** Two large berms were constructed southwest and immediately south of the site. A smaller berm was constructed on the east side of the site. The berms have been landscaped with tall growing trees which will partially shield views of the project from SR 237 and the proposed Bay Trail along the Coyote Creek corridor. The trees will be much more effective at screening the project from SR 237 than from Coyote Creek because the trees were planted closer to highway than they were to the creek.
San Jose Ordinance No. 26579; General Development Plan; Conditions of Approval	3.c) Open space on the Water Pollution Control Plant's "Buffer Lands" to be landscaped consistent with the Alviso Master Plan and WPCP Guidelines. To the extent possible, indigenous species should be planted as grasslands or marshlands with low shrubs and few trees. Trees should be kept close to the buildings.	**Yes.** About 28 acres of the WPCP buffer land surrounding the LECEF access road will be maintained as open space. The berm to the southwest of the site was built on a part of this land. About 20 large coast live oak trees were planted sporadically and informally on the berm. These oaks are native species that are found in the Coyote Creek riparian area. All other trees were planted close to the LECEF structures.

CONCLUSIONS AND RECOMMENDATIONS

With effective implementation of applicant's proposed mitigation measures as described in the AFC, and staff's proposed conditions of certification, the proposed LECEF Phase 2 project would cause less than significant direct and cumulative visual impacts and would comply with applicable visual-resources related LORS.

Staff recommends that the Energy Commission adopt the following conditions of certification (from the LECEF Phase 1 Commission Decision as modified as appropriate for Phase 2) if it approves the LECEF Phase 2 project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 The project owner shall ensure that visual impacts of project construction are adequately mitigated. To accomplish this, the project owner shall require the following as a condition of contract with its contractors to construct the proposed project:

~~Protocol: If visible from nearby residences, SR-237, Zanker Road, or Grand Boulevard, the project site as well as staging and material and equipment storage areas shall be visually screened.~~ All evidence of construction activities, including ground disturbance due to staging and

storage areas, shall be removed and remediated upon completion of construction.

The project owner shall submit a plan to the California Energy Commission Compliance Project Manager (CPM) for review and approval and to the City of San Jose for review and comment for restoring the surface conditions of ~~any rights of way disturbed during construction of underground pipelines; and~~ construction staging and storage areas. The plan shall include grading, contouring, and revegetation consistent with applicable plans.

The project owner shall not implement the plan until receiving written approval of the submittal from the CPM.

Verification: At least 45 days prior to beginning implementation of the surface restoration, the project owner shall submit the restoration plan to the CPM for review and approval and to the City of San Jose for review and comment.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 15 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within 7 days after completing the surface restoration that it is ready for inspection.

VIS-2 The project owner shall a) treat all project structures and buildings visible to the public in appropriate colors or hues that minimize visual intrusion and contrast by blending with the surrounding landscape, and b) ensure that those structures and buildings have surfaces that do not create glare. A specific treatment plan shall be developed for CPM approval to ensure that the proposed colors do not unduly contrast with the surrounding landscape colors. The plan shall be submitted sufficiently early to ensure that any precolored buildings, structures, and linear facilities will have colors approved and included in bid specifications for such buildings or structures. Prior to submittal of the plan to the CPM, the project owner shall submit the plan to the City of San Jose for review and comment.

Protocol: The treatment plan shall include:

a) specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
b) a list of each major project structure, building, and tank, specifying the color(s) proposed for each item;
c) samples of the proposed treatment and color on any fiberglass materials that would be visible to the public and one set of color brochures or color chips showing each proposed color and finish;
d) documentation that the surfaces to be used on all project elements visible to the public will minimize glare; where this is not practicable, provide documentation of the infeasibility of nonglare paint or material;

e) a detailed schedule for completion of the treatment; and;
f) a procedure to ensure proper treatment maintenance for the life of the project.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

Verification: At least 30 days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval and to the City of San Jose for review and comment.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

~~Within seven days of completing the surface treatment~~ Prior to the start of commercial operation of Phase 2, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all buildings and structures (including the perimeter walls) at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

VIS-3 The project owner shall provide landscaping that is effective in screening the majority of structural forms (not the upper portions of the stacks) from the following key viewing areas: (a) SR-237 and the existing bicycle trail to the south, (b) Zanker Road to the west, and (c) the proposed Bay Trail alignments to the east (Reach 1). Screening vegetation must be provided around the project's eastern, southern, and western edges, and include a sufficient number of appropriately located evergreen trees to ensure effective year-round screening. Trees and other vegetation must be strategically placed and of sufficient height and density to achieve maximum effective screening of the proposed project structures as soon as possible. In screening project facilities, care must be taken in siting vegetation plantings to avoid blocking vista views of distant ridgelines.

Protocol: The project owner shall submit a final landscaping plan that has been approved by the Project Architectural Committee. The plan shall, to the extent feasible, incorporate the landscaping plan presented to the Commission on May 20, 2002, by Dr. Priestly. The Plan shall include:

a) 11"x17" color simulations of the proposed landscaping at 5 years as viewed from KOPs 1 and 2;

b) a detailed list of plants to be used and times to maturity given their size and age at planting;

c) a detailed schedule describing when plants will be installed in specific landscape areas, and a discussion which provides the justification for the planting schedule for the specific areas and species proposed;

d) maintenance procedures, including but not limited to, any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and

e) a procedure for monitoring for and replacement of unsuccessful plantings for the life of the project as necessary to maintain a visual screen.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM. However, the planting must be completed as soon as practical without impeding construction and consistent with the Applicant's revised landscaping plan that was presented on May 20, 2002.

Verification: The final project landscaping plan shall be prepared under the direction of the Architectural Committee. At least 30 days prior to installing the landscaping, the project owner shall submit the plan to the CPM for review and approval and the City of San Jose for review and comment. If the CPM does not approve the landscape plan, that element shall return to the Committee for further discussion and resolution.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 days after completing installation of the landscaping, that the landscaping is ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead or dying screening trees and any major repairs to the berms and irrigation system, for the previous year of operation in each Annual Compliance Report.

VIS-4 The project owner shall design and install all lighting such that light bulb~~s~~ and reflector~~s~~ glare are not visible from public viewing areas and illumination of the vicinity and the night sky is minimized during both project construction and operation. The project owner shall develop and submit lighting plans for construction and operation of the project to the CPM for review and approval and the City of San Jose for review and comment.

Protocol: The lighting plan shall require that:

a) All exterior night lighting shall be of minimum necessary brightness consistent with operational safety and security.

b) Lighting shall be designed so that during both construction and operation (consistent with worker safety), highly directional, exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the night sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary, except where necessary for security.

c) High illumination areas not occupied on a continuous basis such as maintenance platforms shall be provided with switches or motion detectors to light the area only when occupied.

d) A lighting complaint resolution form (following the general format of ~~that in **Visual Resources Appendix VR-2**~~ the complaint report/resolution form in the General Conditions section) shall be used by plant operations, to record all lighting complaints received and to document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file. The project owner shall provide a copy of each completed complaint form to the CPM.

Lighting shall not be installed before the plans are approved.

Verification: At least 15 days prior to installing the construction lighting, the project owner shall provide the construction lighting plans to the CPM for review and approval and the City of San Jose for review and comment. If the CPM notifies the project owner that revisions to the construction lighting plan are needed before the CPM will approve the plans, the project owner shall submit a revised plan within seven days of receiving that notification from the CPM

At least 30 days before ordering the facility exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval and the City of San Jose for review and comment. If the CPM notifies the project owner that any revisions to the facility lighting plans are needed before the CPM will approve the plans, the project owner shall submit to the CPM a revised plan within 30 days of receiving the CPM's notice that revisions to the plan are required.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 15 days for construction lighting and 30 days for facility lighting of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide to the CPM a) a report of the complaint, b) a proposal to resolve the complaint, and c) a schedule for implementation of the proposal. The project owner shall provide a copy of the completed complaint resolution form to the CPM within 10 days of complaint resolution, and retain a copy in the project owner's compliance file.

VIS-5 The project owner shall comply with the City of San Jose's requirements regarding signs visible to the public. In addition, the project owner shall install minimal signage, which shall be constructed of non-glare materials and unobtrusive colors. The design of any signs required by safety regulations shall conform to the criteria established by those regulations. The project owner shall submit a signage plan for the project to the CPM for review and approval and to the City of San Jose for review and comment. The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: ~~Prior to first turbine roll and at~~ At least 30 days prior to installing signage visible to the public, the project owner shall submit the plan to the CPM for review and approval and to the City of San Jose for review and comment.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 days after completing installation of the signage that they are ready for inspection.

VIS-6 The project owner shall reduce the six-cell cooling tower visible vapor plumes through the use of a dry-cooling section that has a stipulated plume abatement design equivalent to or better than that depicted in the Data Request Response No. 53 Attachment VIS-3 Fogging Frequency Curve, dated April 2004. Automated meteorological equipment that monitors plume forming ambient conditions shall be used to notify the operator when the plume abatement system needs to be activated immediately to ensure that plumes are abated to the maximum extent possible for the stipulated design point. The monitoring system shall also include a video camera and feed to the control room to provide visual verification of plume abatement.

The project owner shall operate the one-cell cooling tower in a manner that abates visible plumes to the maximum extent possible based on the existing plume abatement design.

~~The project owner shall implement the "best commercially-feasible available technology" for cooling-related plume abatement. The project owner shall not construct the cooling system until the project owner receives notification of approval from the CPM that the proposed system incorporates the "best commercially-feasible available technology" for plume abatement.~~

Verification: At least 60 days prior to construction of the six-cell cooling tower, the project owner shall provide to the CPM for review and approval the specifications for the abatement system (including the fogging frequency curve) and for the meteorological monitoring and notification system and the operations protocol for its use, that will be used to ensure maximum plume abatement from the dry-cooling section of the six-cell cooling tower. ~~At least 60 days prior to construction of the cooling system, the project owner shall submit to the CPM for review and approval and to the City of San Jose for review and comment an analysis that reviews commercially-feasible and available~~

~~plume abatement technologies for the cooling system (including dry-chilling) and presents their effectiveness and costs compared to the proposed system, which consists of a two-cell wet counter flow cooling tower.~~

The project owner shall provide a written certification in each annual compliance report to demonstrate that the cooling towers have consistently been operated within the design parameters, except as necessary to prevent damage to the cooling tower. If determined by the CPM to be necessary to ensure operational compliance, based on legitimate complaints received or physical evidence of potential non-compliant operation, the project owner shall monitor the cooling tower operating parameters in a manner and for a period as specified by the CPM. For each period that the cooling tower operation monitoring is required, the project owner shall provide to the CPM the cooling tower operating data within 30 days of the end of the monitoring period. The project owner shall include with this operating data an analysis of compliance and shall provide proposed remedial actions if compliance cannot be demonstrated.

~~**VIS-7** The project owner shall continue to confer with the cities of San Jose and Milpitas to consider additional aesthetic changes that incorporate interesting and attractive design qualities and promote a high standard of architectural excellence, and that can be implemented during the post-licensing period.~~

Verification: ~~The project owner will meet with representatives of the Cities of San Jose and Milpitas and provide a report to the CPM on additional measures, including screening, painting, design, or architectural treatment that may improve the aesthetic appearance of the project. Prior to commercial operation, the project owner shall submit the report, including 11"X17' high quality color photo simulations of the proposed aesthetic treatment as seen from at least KOPs 1 and 2, to the CPM for review and approval. If approved by the CPM, the project owner shall implement these additional aesthetic measures within 180 days of the simple cycle commercial operation date.~~

REFERENCES

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commission Decision. July 2, 2002.

City of San Jose. 2020 General Plan. As amended through April 15, 2003.

City of San Jose. Title 20 of the San Jose Municipal Code. Zoning Ordinance. As amended through April 30, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

Walters, William. Visible Plume Analysis for LECEF Phase 2. Modeling analysis prepared by William Walters of Aspen Environmental Group for Energy Commission staff. June 2004.

APPENDIX VR-1: STAFF'S VISUAL RESOURCES EVALUATION METHODOLOGY

Staff's analysis of potential impacts to Visual Resources caused by construction or operation of any power plant or related facility largely involves answering the four questions found in Appendix G of the CEQA Guidelines, under Aesthetics. The four questions that must be addressed regarding whether the potential impacts of a project are significant are:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

The visual analysis typically distinguishes between three different impact durations: temporary impacts, typically lasting no longer than two years; short-term impacts, generally last no longer than five years; and long-term impacts, which are impacts with a duration greater than five years. In general, short-term impacts are not considered significant.

In addition to visiting the project area for personal observation of how and whether a particular view is experienced, staff also searches for other evidence to determine if the local community values a particular view that might be affected by the project. This includes searching the applicable planning documents covering the area produced by local governments and community groups, as well as searches for any other type of evidence showing whether valued scenic vistas exist within the project's viewshed. Staff relies primarily on personal observation of the project site to make initial determinations of visual character or quality of the area, in comparison with all other landscapes in California, but also gives due deference to official statements by elected governmental bodies concerning the value of visual resources within the project area.

Staff answers each of the four checklist questions for each part of the project both during construction and during operation, including any related facility such as a transmission line or gas pipeline. To answer the first checklist question (Would the project have a substantial adverse effect on a scenic vista?), staff must determine if any such scenic vista exists within the viewshed of the various aspects of the project, and then determine if the project would have a substantial adverse effect on that vista.

To help make these determinations, visual resource professionals often answer a series of questions developed to help focus the analysis, and examine various ways that the project could create an impact to scenic vistas. The Energy Commission's Visual Resources staff has developed such a list for each of the four CEQA guideline questions, drawing upon published methodologies and academic resources (Smardon,

et al.), as well as on experience with other power plant siting cases. Questions developed to help determine whether the project would significantly affect a scenic vista include:

1. Is the project located in the scenic view of a local/state/federal-designated scenic vista?
2. Is there compelling evidence to show that the view is designated/valued by the local community?
3. Will the project eliminate or block views of valuable visual resources?
4. Would the project create a water vapor plume that could have an adverse effect on a state/federal/local-designated scenic vista?

To help answer the second CEQA checklist question above (Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?), staff developed the following questions:

1. Is the project located in the scenic view from a local/state/federal-designated scenic highway?
2. Does the project site or its immediate vicinity contain scenic resources, such as trees, rock outcroppings, or historic structures that could be damaged by the project?
3. Would the project create a water vapor plume that could have an adverse effect on the view from a local/state/federal-designated scenic highway?

To answer the third question (Would the project substantially degrade the existing visual character or quality of the site and its surroundings?), staff assesses the existing visual character and quality of the project area, and then determines how the project would affect the character and quality of the project viewshed. To assess whether the project has the potential to substantially degrade the present visual character or quality, staff uses personal observation and such tools as visual simulations to determine if an impact is significant and mitigation is required to reduce the impact to a less-than-significant level. To make that determination, staff examines many factors, such as: how many viewers can see a particular view and for how long, collectively called “viewer exposure”; and to what degree would the project change the aspects of a given view, such as whether the project’s components would block a particular view.
To help determine how the community rates and values the visual character and quality of a given site, and whether the project would substantially alter the present visual character or quality, staff developed the following questions:

1. How many residential, recreational, and traveling (motorist) viewers have views of the project?
2. Is the project site properly zoned?
3. Would a conditional use permit and/or height variance have been required from the city/county (if so what conditions would the city/county place on the power plant)?

4. Does the project conform to the clear written declarations of local/state/federal agencies to protect designated visual resources of importance or the valued aesthetic character of a neighborhood (said declaration must be clear, concise, and uncompromised by conflicting declarations, and be an official action of the governing body (City Council/Board of Supervisors) such as a General Plan element, zoning ordinance, or design guideline)?
5. Will the project substantially alter the existing viewshed, including any changes in natural terrain?
6. Does the project substantially change the existing setting?
7. Has the applicant proposed landscaping?
8. Would the project create a water vapor plume that could have an adverse effect on a KOP view?

The process of answering these questions includes an examination of the present views within the project viewshed in terms of aesthetics – i.e., by examining the various aspects that together define the quality of a view – followed by an assessment of how the various aspects of the aesthetics of the view would be affected by the project, which conversely could be described as an analysis of how well the project area can absorb the various aspects of the project into the landscape.

To answer the fourth CEQA Guidelines checklist question (Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?), staff analyzes the project's lighting plans to ensure they fit with established norms for low-impact lighting designs, and then answers the following questions to determine if a potential for impact from night-lighting exists:

1. With the Energy Commission's standard condition of certification for lighting control, would light or glare be reduced to acceptable levels?
2. Will the project result in significant amounts of backscatter light into the nighttime sky?

APPENDIX VR-2: STAFF'S VISIBLE PLUME MODELING ANALYSIS

VISIBLE PLUME ANALYSIS

William Walters

INTRODUCTION

The following provides the assessment of Los Esteros Critical Energy Facility 2 (LECEF) Phase 2 cooling tower and turbine/heat recovery steam generator (HRSG) exhaust stack visible plumes. Staff completed a plume frequency analysis for the applicant's proposed plume-abated cooling tower and non-abated turbine/HRSG designs.

PROJECT DESCRIPTION

The project includes two potential configurations, one the conversion of the existing simple cycle turbine configuration to a combined cycle configuration and the other remaining as a simple cycle configuration. The simple cycle configuration has previously been evaluated (CEC 2001), so this evaluation only considers the change to a combined cycle configuration.

The combined cycle configuration includes: 1) four General Electric LM 6000 PC Sprint type engines with inlet air chillers, with the addition of small duct burners and a heat recovery section; and 2) adding a six cell plume-abated cooling tower and retaining the existing one-cell plume-abated cooling tower. Converting to a combined cycle operation reduces the turbine/HRSG exhaust temperature and increases the exhaust moisture content during peaking operations, and requires significant additional cooling capacity. Peaking operations (i.e. duct firing) will be limited to 1,250 hours per year (LECEF, LLC. 2003).

VISIBLE PLUME MODELING METHODS

PLUME FREQUENCY MODELING

The Combustion Stack Visible Plume (CSVP) model was used to estimate plume frequency for the turbine/HRSG exhausts. This model uses both hourly exhaust parameters and hourly ambient condition data to determine the plume frequency. The plume frequency module of the CSVP model is based on an algorithm that determines whether the plume, as it mixes with the given ambient air condition, will cross the air/water vapor saturation curve. If the saturation curve is crossed a supersaturated condition is predicted to occur, and water vapor condensation and the formation of a visible plume is assumed.

The plume abated cooling tower plume frequency was determined by using the fogging frequency curves provided for the abated tower design. Meteorological data was

screened to determine the number of hours were the ambient conditions would be above the fogging frequency design curves. Hours with ambient conditions above the curve are assumed to have a visible plume and hours with ambient conditions below the curve are assumed not to have a visible plume.

CLOUD COVER DATA ANALYSIS METHOD

A plume frequency of 10% of seasonal (November through April) daylight no rain/fog high visual contrast (i.e. “clear”) hours is used to determine potential plume impact significance. The high visual contrast hours analysis methodology is provided below:

Energy Commission staff have identified a “clear” sky category during which plumes have the greatest potential to cause adverse visual impacts. For this project the meteorological data set[1] used in the analysis categorizes total sky cover and opaque sky cover in 10% increments. Staff has included in the “Clear” category a) all hours with total sky cover equal to or less than 10% plus b) half of the hours with total sky cover 20-100% that have sky opacity equal to or less than 50%. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with sky under clear conditions and, when total sky cover is equal to or less than 10%, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100% and the opacity of sky cover is relatively low (equal to or less than 50%), clouds do not substantially reduce contrast with plumes; staff has estimated that approximately half of the hours meeting the latter sky cover and sky opacity criteria can be considered high visual contrast hours and are included in the “clear” sky definition.

If it is determined that the seasonal daylight clear hour plume frequency is greater than 10% then plume dimensions are determined and a significance analysis of the plumes is included in the Visual Resources section of the Staff Assessment.

COOLING TOWER VISIBLE PLUME MODELING ANALYSIS

COOLING TOWER DESIGN AND OPERATING PARAMETERS

The new cooling tower design characteristics, presented below in **Table 1**, were determined through a review of the applicant’s AFC (LECEF 2003). The plume-abated cooling tower performance was determined by assessing the fogging frequency curves provided by the applicant in Data Response 53 and Attachment VIS-3 (LECEF 2004b).

[1] This analysis uses a San Francisco Airport (SFO) HUSWO meteorological data set obtained from the NCDC.

Table 1 – New Cooling Tower Design Parameters

Parameter	Design Parameter Value
Number of Cells	6 (1 x 6)
Housing Length	289 feet (88.11 meters)
Housing Width	49 feet (14.94 meters)
Stack Height (Cell Cone Height)	58 feet (17.68 meters)
Cell Stack Diameter	32 feet (9.76 meters)

Source: AFC (LECEF 2003) pg. 8.13-8.

COOLING TOWER VISIBLE PLUME MODELING ANALYSIS

Staff predicted the visible plume frequency of the plume-abated cooling tower by screening a six-year meteorological data set (SFO 1990-1996) against the fogging frequency curves provided for the cooling tower (LECEF 2004b, Attachment VIS-3). **Table 2** provides the predicted plume frequencies for the plume-abated cooling tower.

Table 2 – Staff Predicted Hours with Cooling Tower Steam Plumes SFO 1990-1996 Meteorological Data

Period	Available (hr)	Base Load		Peaking	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,583	4,026	7.66%	10,725	20.40%
Daylight Hours	26,843	785	2.92%	2,113	7.87%
Nighttime Hours	25,740	3,241	12.59%	8,612	33.46%
Daylight NRNF	24,694	297	1.20%	1,051	4.26%
Seasonal DNRNF*	10,354	232	2.24%	726	7.01%
Seasonal Daylight Clear*	10,354	85	0.82%	240	2.32%

*Seasonal conditions occur anytime from November through April.

The plume frequency analysis predicts that the cooling tower plume frequencies will be less than 10% of seasonal daylight clear hours for base load or peaking load conditions. Peaking operations will be limited to 1,250 hours per year (LECEF 2003), and peaking is likely to be performed in the summer peak demand period; therefore, the operating plume frequency for seasonal daylight clear hours would be expected to be much closer to that predicted for the base load case than the peaking case.

HRSG VISIBLE PLUME MODELING ANALYSIS

Staff evaluated the applicant's AFC (LECEF 2003) and performed an independent psychrometric analysis. The CSVP model was used to estimate the worst-case potential plume frequency for each HRSG stack.

HRSG PARAMETERS

Based on the stack exhaust parameters anticipated by the applicant for the combined cycle configuration, the frequency of visual plumes can be estimated. The operating data for these stacks are provided in **Table 3**.

Table 3 – HRSG Exhaust Parameters

Parameter	HRSG Exhaust Parameters				
Stack Height	90 feet (27.44 meters)				
Stack Diameter	11.375 feet (3.47 meters)				
Ambient Conditions	Molecular Weight[1]	Moisture Content (Mole %)	Moisture Content (% by weight) [1]	Exhaust Flow (klb/hr)	Exhaust Temp (°F)
Base Load					
29 °F	28.17	9.76%	6.23%	1,174.6	207
61 °F	28.10	10.39%	6.65%	1,090.2	201
81 °F	28.11	10.35%	6.63%	1,072.8	205
Peaking					
29 °F	28.07	11.37%	7.29%	1,180.6	196
61 °F	28.00	12.06%	7.75%	1,096.1	194
81 °F	27.00	12.11%	7.78%	1,078.9	197

Source: AFC (LECEF 2003), pg. 8.13-8 and Appendix 8.1-A2 Table 8.1-A2-1)
Note(s): 1. Calculated values.

HRSG VISIBLE PLUME MODELING ANALYSIS

Staff modeled the HRSG plume frequency using the CSVP model with a six-year meteorological data set from SFO. **Table 4** provides the CSVP model visible plume frequency results.

Table 4 – Staff Predicted Hours with HRSG Steam Plumes SFO 1990-1996 Meteorological Data

Period	Available (hr)	Base Load		Peaking	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,583	4,216	8.02%	16,059	30.54%
Daylight Hours	26,843	744	2.77%	3,349	12.48%
Nighttime Hours	25,740	3,472	13.49%	12,710	49.38%
Daylight NRNF	24,694	347	1.41%	2,117	8.57%
Seasonal DNRNF*	10,354	333	3.22%	1,697	16.39%
Seasonal Daylight Clear*	10,354	165	1.59%	660	6.37%

*Seasonal conditions occur anytime from November through April.

The plume frequencies are predicted to be well less than 10% of seasonal daylight clear hours at base load or peaking conditions. Peaking operations will be limited to 1,250 hours per year (LECEF 2003), and peaking is likely to be performed in the summer peak demand period; therefore, the operating plume frequency for seasonal daylight clear hours would be expected to be much closer to that predicted for the base load case than the peaking case.

CONCLUSIONS

Visible plumes from the proposed LECEF cooling tower and turbine/HRSGs exhausts are expected to occur less than 10% of seasonal daylight clear hours.

REFERENCES

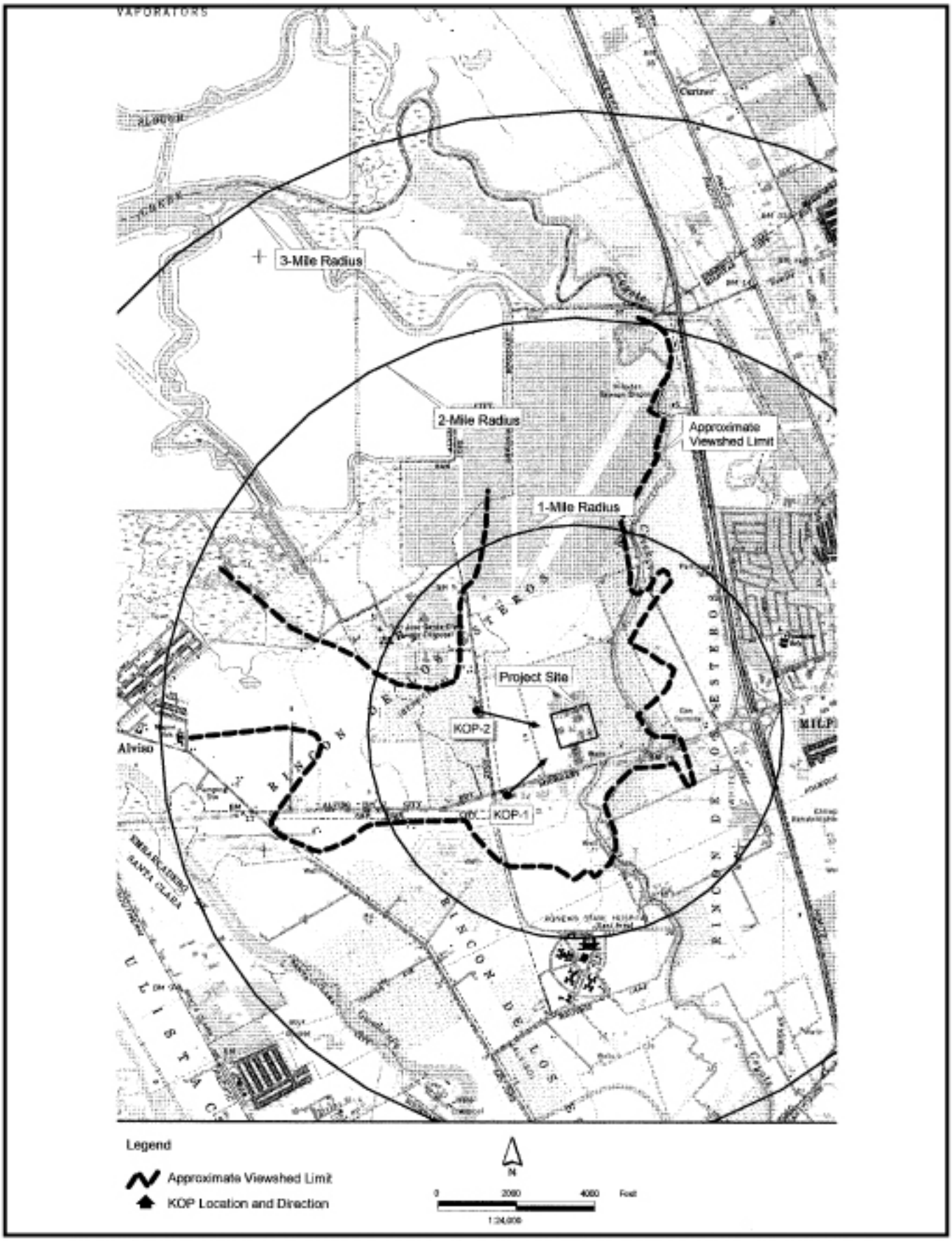
CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

VISUAL RESOURCES - FIGURE 1

Los Esteros Critical Energy Facility II - Phase 2 - Location and View Direction of Key Observation Points



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC Figure 8.13-1

VISUAL RESOURCES - Figure 2A

Los Esteros Critical Energy Facility II - Phase 2 - KOP 1 - Existing View of LECEF Site, Looking Northeast from State Route 237 at Zanker Road

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC Figure 8.13-2A

VISUAL RESOURCES - Figure 2B

Los Esteros Critical Energy Facility II - Phase 2 - KOP 1 - Simulation of LECEF2 Phase 2, Looking Northeast from State Route 237 at Zanker Road

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC Figure 8.13-2B

VISUAL RESOURCES - Figure 2C

Los Esteros Critical Energy Facility II - Phase 2 - KOP 1 - Simulation of LECEF2, Phase 2 with Landscaping at 5 years from Planting, Looking Northeast from State Route 237 at Zanker Road

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: Data Response 47, Figure DR47-1

VISUAL RESOURCES - Figure 2D

Los Esteros Critical Energy Facility II - Phase 2 - KOP 1 - Simulation of LECEF2, Phase 2 with Landscaping at 20 years from Planting, Looking Northeast from State Route 237 at Zanker Road

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: Data Response 47, Figure DR47-2

VISUAL RESOURCES - Figure 3A

Los Esteros Critical Energy Facility II - Phase 2 - KOP 2 - Existing View of LECEF Site, Looking East from Zanker Road

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC Figure 8.13-3A

VISUAL RESOURCES - Figure 3B

Los Esteros Critical Energy Facility II - Phase 2 - KOP 2 - Simulation of LECEF2 Phase 2, Looking East from Zanker Road

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, DECEMBER 2004

SOURCE: AFC Figure 8.13-3B

WASTE MANAGEMENT

Testimony of Ramesh Sundareswaran

INTRODUCTION

This analysis is to assess the potential impacts associated with the planning and managing of wastes generated from constructing and operating the proposed Phase 2 combined-cycle conversion of the existing Los Esteros Critical Energy facility (LECEF). It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with the generating, handling, storing, transporting, treating and disposing of project-related hazardous and nonhazardous wastes.

Energy Commission staff's overall objective is to ensure that the management of the wastes from the project will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner and disposal of the wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

A framework, based on LORS, exists to reduce risks to the public and environment from the generation, storage, transport and disposal of both hazardous and nonhazardous wastes. The institutional and legal conditions of applicable laws, regulations, policies and programs that would regulate wastes from the Phase 2 combined-cycle conversion of LECEF (LECEF Phase 2) are outlined below.

FEDERAL

Resource Conservation and Recovery Act, RCRA (42 U.S.C. § 6922)

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

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

Title 40, Code of Federal Regulations, Part 260

These sections specify the regulations promulgated by the EPA to implement the requirements of RCRA as described above. To facilitate such implementation, the

defining characteristics of each hazardous waste are specified in terms of toxicity, ignitability, corrosivity, and reactivity.

STATE

California Health and Safety Code § 25100 et seq. (Hazardous Waste Control Act of 1972, as amended)

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

Title 14, California Code of Regulations, § 17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)

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

California Civil Code section 1471

This section delineates the various circumstances under which land use restrictions can be recorded to specify requirements or limitations on the use of real property. It also points out that land use restrictions are binding on current and subsequent property owners, and remain in effect until they are formally removed or modified.

Title 22, California Code of Regulations, Division 4.5, Chapter 39

This regulation provides specific details regarding the application of appropriate land use covenants as adopted by the Department of Toxic Substances Control (DTSC). Land use covenants can be used by DTSC when (1) facility closure, corrective action, remedial action, or other responsive actions are undertaken pursuant to chapter 6.5, 6.8, or 6.85 of division 20 of the Health and Safety Code, or article 1 of chapter 1, part 10.5 of the education code, and (2) hazardous materials, wastes, constituents, or substances will remain at the property at levels which are not suitable for unrestricted use of the land.

Title 22, California Code of Regulations, § 66262.10 et seq. (Generator Standards)

These sections establish specific requirements for generators of hazardous wastes with respect to handling and disposal. Under these requirements, all waste generators are required to determine whether or not their wastes are hazardous according to state-specified criteria. As with the federal program, every hazardous waste generator is required to obtain an EPA identification number, prepare all relevant manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal

facilities. Additionally, all hazardous wastes are required to be handled only by registered hazardous waste transporters. Requirements for record keeping, reporting, packaging, and labeling are also established for each generator.

LOCAL

The City of San Jose has the responsibility for administration and enforcement of the California Integrated Waste Management Act for non-hazardous solid waste for the proposed LECEF Phase 2.

The Santa Clara County Environmental Health Department is designated by the State of California as a Certified Unified Program Agency (CUPA) to administer and enforce compliance with the Hazardous Waste Control Act. This agency will also regulate hazardous waste management, handling and disposal procedures at the proposed LECEF Phase 2.

SETTING

PROJECT AND SITE DESCRIPTION

LECEF, LLC, a subsidiary of Calpine Corporation and current owners of LECEF, proposes to convert the existing power plant to operate as a combined-cycle facility in the City of San Jose, in Santa Clara County, California. As proposed, the LECEF will be converted to a 320 MW facility through the addition of heat recovery steam generators, cooling towers and adding ancillary equipment to the existing LECEF, increasing power output by 140 MW (LECEF, LLC. 2003; LECEF, LLC. 2004a).

The proposed project is located on a 34-acre parcel located near the northwest corner of the intersection of Highway 237 and Coyote Creek. The address is 800 Thomas Foon Chew Way, the project's 2,700 foot-long access road which intersects Zanker Road north of Highway 237. The site is in an agricultural, residential, and commercial area bounded by properties maintaining those uses, as well as vacant land. The San Jose-Santa Clara Water Pollution Control Plant (WPCP) is situated to the northwest of the LECEF. WPCP buffer land exists to the west and the facility's sludge drying ponds exist to the north of the proposed project site.

Prior to the July 2, 2002 Energy Commission licensing of the original LECEF, the site underwent both Phase I and Phase II Environmental Site Assessments (ESA) in succession. Historically, chemicals detected at the site included total DDT, arsenic, lead, toxaphene, dieldrin and endrin, consistent with the site's past agricultural use. The ESAs were then followed by a limited site remediation, which occurred prior to the completion of the licensing. The remediation consisted of the (1) removal and disposal of at least three fuel underground storage tanks, (2) disposal of lead contaminated debris, (3) disposal of asbestos wastes, (4) disposal of a limited amount of toxaphene and DDT contaminated soil excavated from two pesticide mixing/storage areas, and (5) abandonment of several onsite water supply and groundwater monitoring wells (CEC 2001, LECEF, LLC. 2003, LECEF, LLC. 2004b). Excluding those soils removed from the pesticide mixing/storage areas, the remaining soils at the site were left in place, though they were contaminated with elevated levels of pesticides and metals. This was

on the grounds that the concentrations of the pesticides and metals were below then-U.S. EPA Region IX Preliminary Remediation Goals (PRGs) permitted for industrial use (LECEF, LLC. 2003, LECEF, LLC. 2004b). PRGs are chemical concentrations that correspond to fixed levels of health risk in soil, water, and air and serve as tools that can be used for evaluating and cleaning up contaminated sites.

The AFC notes that the underlying soils at the site still contain residual contamination and that elevated levels of total DDT, dieldrin, endrin, lead and arsenic can persist at the site (LECEF, LLC. 2003, LECEF, LLC. 2004b). Of interest is that, among these contaminants, total DDT and arsenic are likely in the soils, at concentrations that are above current industrial PRGs (DTSC 2004). The current industrial PRG is 7.0 milligram/kilogram (mg/kg) for total DDT and 1.6 mg/kg for arsenic. Total DDT was detected in the site's surface and subsurface soils up to 11.03 mg/kg and arsenic up to 67 mg/kg according to the ESAs (LECEF, LLC. 2003, LECEF, LLC. 2004b). The potential for exposure to these contaminated soils at LECEF is currently mitigated through covering with buildings, paving and gravel. However, there are uncovered areas at LECEF, which can serve as potential sources of adverse health effects through potential exposure to contaminants in the surface soils to onsite workers and site visitors (DTSC 2004). Further, proposed construction activities for the LECEF Phase 2 could exacerbate potential exposure through incidental ingestion, dermal contact, and inhalation of resuspended particulates from soils in both covered and exposed areas to onsite workers, including construction workers, site visitors and neighbors (DTSC, 2004).

IMPACTS

PROJECT SPECIFIC IMPACTS

Construction impacts

Site preparation, along with construction for the proposed conversion will generate a variety of nonhazardous and hazardous wastes.

Nonhazardous waste streams from construction may include paper, wood, glass, and plastics. These will be generated from packing materials, waste construction lumber, insulation materials, and empty containers. The applicant indicates that about 10 tons of these wastes will be generated during construction. These wastes will be recycled where practical, with the rest discharged to a Class III landfill. Because San Jose has a "free market" system for the collection of solid waste, LECEF will have to select from 11 different franchised companies to determine both who will collect the waste and where it will be disposed. The possible landfills listed in Table 8.14-3 of the AFC have estimated remaining capacities ranging from 6 to 40 years (LECEF, LLC, 2003). Hazardous material containers may be classified as nonhazardous if they are emptied and managed according to specified methods. (Cal. Code Regs., tit.22 section 66261.7).

An estimated 10 tons of concrete are expected to be generated during the Phase 2 construction. Waste concrete will be disposed of in a Class III landfill or at clean fill sites.

Up to 10 tons of metal wastes from welding and cutting operations, packing materials, trim, and empty containers and drums will be generated. This also includes aluminum waste from packing materials and wiring. This waste will be recycled through scrap metals brokers with the remainder disposed to a Class III landfill.

The types of hazardous wastes normally generated during construction include waste lubricating oil, cleaning solvents, paints, batteries, oily rags and absorbent materials, and welding materials. Section 8.14.3 of the AFC lists pipe flushing and cleaning fluids, passivating fluids, and solvents as the primary hazardous wastes generated during construction (LECEF, LLC 2003). The construction contractor will be responsible for these hazardous wastes during the construction phase. Further, these wastes will be recycled or disposed of in a licensed hazardous waste treatment or disposal facility.

Hazardous waste generated during construction could also include contaminated surface and subsurface soils as describe above. Surface soils in uncovered areas at LECEF could pose a health risk to onsite workers and visitors. In addition, during any soil disturbance for construction purposes, onsite workers, site visitors, and the public could be exposed to the residual pesticides, elevated levels of metals, or other contamination. Improper management of the contaminated soils during construction can cause undue delays or stop the project. Anticipating potential problems and using written procedures to establish how these problems will be addressed can minimize undue delays and stoppages. Staff therefore proposes a condition of certification, **WASTE-6**, requiring preparation of a Soils Management Plan (SMP) so that contractors and others, through site-specific information, can better manage environmental and health and safety contingencies at LECEF. **WASTE-6** will replace **WASTE-3** and **WASTE-4.**

The existing residual pesticides and metals at LECEF will continue to remain at the site following construction of LECEF Phase 2, given their persistent nature. Further, these contaminants will remain at levels that are not suitable for unrestricted use of the land. Though the proposed LECEF Phase 2 would be on land currently zoned for industrial use, there is no surety that the land or parts of it will not be redeveloped in the future for some use other than industrial. Staff therefore proposes condition of certification, **WASTE-7**, that imposes appropriate limitations on land use. It requires the Project Owner/Applicant to undertake clean-up of the residual contamination, as needed, and appropriate to the intended use, should the land or parts of it ever undergo a change in ownership (e.g. sale, gift or barter), be leased or rented. This will insure that the public is protected from unsafe exposures to the residual contamination that has been left in place.

Operation impacts

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

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, and used filters. The applicant estimates that about 25 cubic yards of such wastes will be generated

annually. Metal parts and other materials such as paper, aluminum, and plastic will be recycled through brokers, when possible. Nonrecyclable solid wastes will be transported to Class III landfills.

Tables 8.14-1 and 8.14-2 of the AFC lists the hazardous wastes expected to be generated during facility operation, along with the origin, composition, estimated quantity, classification, and disposal method of each (LECEF, LLC 2003). These wastes include spent air pollution control catalysts, used oil and sorbents, cooling tower sludge, laboratory analysis waste, and chemical feed area drainage. Other typical operational hazardous wastes might include paints, thinners, solvents and batteries.

Some of the hazardous wastes can be recycled, such as used oil, solvents, batteries, and the spent SCR catalyst. Other wastes can be treated on-site (neutralized), and still others will require off-site disposal. LECEF, LLC intends to follow the hierarchical approach to waste management that begins with reduction, then recycling, and then treatment, followed finally by disposal when necessary.

All hazardous wastes generated during construction and operation will be managed in accordance with federal and state laws and regulations including licensing, personnel training, waste storage times, and reporting and record keeping. The wastes will be properly characterized, segregated in bermed storage areas, and accumulated for time periods less than 90 days. They will then be transported offsite to approved treatment, storage, or disposal (TSD) facilities by licensed hazardous waste haulers using appropriate manifests. To help ensure the use of appropriate hazardous waste disposal facilities, condition of certification **WASTE-1** will require the project owner to continue notifying staff of any known enforcement actions against hazardous waste facilities or companies used for project wastes. Also, **WASTE-5** will require the project owner to continue using its unique hazardous waste generator number for identification and tracking purposes. Any LECEF Phase 2 construction contractor will also be required to obtain such a number.

As final facility design and operational procedures may impact the amounts and types of wastes ultimately generated, the project owner would be required to submit waste management plans for construction and operation to staff under condition of certification **WASTE-2**.

Impacts on existing waste disposal facilities

The Newby Island landfill in Milpitas, Guadalupe and Kirby Canyon landfills in San Jose and the Altamont Pass landfill have been identified as potential sites for disposal of nonhazardous waste from the proposed facility (LECEF, LLC. 2003). In addition, the Recyclery at Milpitas has been identified as a potential recycling facility for the non hazardous waste expected to be generated from the proposed project (LECEF, LLC 2003). The volume of nonhazardous waste expected from constructing and operating the proposed facility is a fraction of the available annual landfill capacities. Even discounting the effects on the total amount of nonhazardous wastes destined for landfilling, the amounts of waste generated during project construction and operation are insignificant relative to available disposal capacities and would not significantly affect the daily operation or remaining lifetimes.

Three Class I landfills in California, at Kettleman Hills in Kings County, Buttonwillow in Kern County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of twenty million cubic yards of remaining disposal capacity at these landfills, with remaining operating lifetimes of over 40 years. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and waste that is transported out of state.

Much of the hazardous waste generated during construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of such wastes from the proposed facility would be a small fraction of existing landfill capacity and will not significantly impact the capacities or remaining lives of any of the Class I landfills.

CUMULATIVE IMPACTS

Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual recycling and disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes. As stated above, the amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction and recycling efforts by generators.

FACILITY CLOSURE

Facility closure, with respect to waste management, is discussed in section 8.14.5.3 of the AFC (LECEF, LLC. 2003). During any type of facility closure (see staff's **General Conditions and Compliance** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff has determined that conditions of certification in the **General Conditions and Compliance** section will adequately address waste management issues related to closure.

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

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

CONCLUSIONS

The construction and operation of LECEF Phase 2 will involve the generation, use, storage, transport and treatment of both hazardous and nonhazardous wastes. These wastes can adversely impact human health and/or the environment if improperly generated, used, stored, transported or treated.

As discussed above, staff has determined that the project will comply with all applicable federal, state, and local requirements pertaining to the management of nonhazardous and hazardous wastes. These requirements include the preparation of, implementation of, and training in various plans, programs, and permits. Consequently, any potential impact on human health and/or environment is reduced to a less-than-significant level through implementation of sustained compliance with these various regulatory requirements and staff's proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-2 Prior to the start of construction and operation, the project owner shall prepare and submit to the CEC CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

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

Verification: No less than 30 days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

~~**WASTE-3** The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.~~

~~**Verification:** At least 30 days prior to the start of site mobilization, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist contracted for consultation to the CPM for approval.~~

~~**WASTE-4** If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and the CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the San Francisco Regional Water Quality Control Board, the Santa Clara County Certified Unified Permitting Agency (CUPA), and the Berkeley Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.~~

~~**Verification:** The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within five days of their receipt.~~

WASTE-5 Both the project owner and its construction contractor shall obtain unique hazardous waste generator identification numbers from the Department of Toxic Substances Control (DTSC) prior to generating any hazardous waste.

Verification: The project owner and its construction contractor shall keep copies of the identification numbers on file at the project site and notify the CPM via the monthly compliance report of their receipt.

WASTE-6 The project owner shall prepare and submit to the CPM, a Soils Management Plan (SMP) prior to any earthwork. The SMP must be prepared by a California Registered Geologist, a California Certified Engineering Geologist, or a California Registered Civil Engineer with sufficient experience in hazardous waste management. The SMP shall be updated as needed to reflect changes in laws, regulations or site conditions. A SMP summary report, which includes all analytical data and other findings, must be submitted once the earthwork has been completed. Topics covered by the SMP shall include, but not be limited to:

- Land use history, including description and locations of known contamination

- The nature and extent of previous investigations and remediation at the site
- The nature and extent of unremediated areas at LECEF Phase 2
- A listing and description of institutional controls, such as the City's excavation ordinance and other local, state, and federal regulations and laws that will apply to LECEF Phase 2
- Names and positions of individuals involved with soils management and their specific roles
- An earthwork schedule
- A description of protocols for the investigation and evaluation of the historically site related chemicals such as DDT and arsenic and previously unidentified contamination that may be encountered, including temporary and permanent controls that may be required to reduce exposure to onsite workers, visitors and the public
- Requirements for site-specific Health and Safety Plans (HSPs) to be prepared by all contractors at LECEF Phase 2. The HSP should be prepared by a Certified Industrial Hygienist to protect onsite workers by including engineering controls, monitoring, and security to prevent unauthorized entry and to reduce construction related hazards. The HSP should address the possibility of encountering subsurface hazards including hazardous waste contamination and include procedures to protect workers and the public
- Hazardous waste determination and disposal procedures for known and unidentified contamination
- Requirements for site specific techniques at the site to minimize dust, manage stockpiles, run-on and run-off controls, etc
- Copies of relevant permits or closures from regulatory agencies

Verification: At least 45 days prior to any earthwork, the project owner shall submit the SMP to the CPM for review and approval. The SMP shall also be submitted to the Berkeley office of the California Department of Toxic Substances Control for review and comment. A SMP summary, including all analytical data and other findings, shall be submitted to the CPM and DTSC within 25 days of completion of earthwork.

WASTE-7 The project owner shall not change ownership of, rent or lease the entire project site or a portion for non-power plant use, without first notifying the CPM and DTSC (or its successor) and performing any remediation necessary to bring that particular portion of the site or the entire site itself (as applicable) into conformance with then current site cleanup standards appropriate to the intended use of that portion or the entire site.

At least 90 days prior to the change of ownership, rental or lease of the project site or a portion for non-power plant use, the project owner shall submit such notification to the CPM and DTSC and a statement that documents that the particular portion or the entire site will meet then current cleanup standards appropriate to its intended use or a remediation plan, if

required to bring that portion or the entire site into conformance with the intended use.

REFERENCES

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

CEC (California Energy Commission) 2002a. Supplement to the Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). February 5, 2002.

CEC (California Energy Commission) 2002b. Los Esteros Critical Energy Facility Project (01-AFC-12) Commision Decision. July 2, 2002.

DTSC (Department of Toxics Substances Control) 2004. Email comments from Janet Naito to R. Sundareswaran of CEC dated April 6, 2004 regarding DTSC comments on the Los Esteros 2 project.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Geoff Lesh, P.E. and Rick Tyler

INTRODUCTION

Worker safety and fire protection is ensured through enforcement of laws, ordinances, regulations, and standards (LORS), and implemented at the federal, state, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Workers at power production facilities operate process equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment, or procedural controls.

The purpose of the Worker Safety and Fire Protection Analysis is to assess the worker safety and fire protection measures proposed by the Los Esteros Critical Energy Facility Phase 2 (LECEF, Phase 2) and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

In December 1970, Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act (OSH Act) of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define the procedures for conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

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

Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the OSH Act.

Applicable federal requirements include:

- 29 U.S.C. § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 C.F.R. §§ 1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 C.F.R. §§ 1952.170 – 1952.175 (federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in 29 C.F.R. §§ 1910.1 – 1910.1500).

STATE

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as published in the California Labor Code section 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with sections 337 through 560 and continuing with sections 1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the federal requirements. California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at Title 29 Code of Federal Regulations, sections 1910.1 through 1910.1500. The U.S. Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

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

Employers are responsible for informing their employees about workplace hazards, potential exposure, and the work environment (Labor Code §6408). Cal/OSHA's tool for ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (Cal. Code Regs., tit. 8, § 5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the federal Hazard Communication Standard (29 C.F.R. §1910.1200) which established, on the federal level, an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, Title 8, California Code of Regulations, section 3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace

hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- Title 8, California Code of Regulations, section 330 et seq. Cal/OSHA regulations;
- Title 24, California Code of Regulations, section 3 et seq. - incorporates the current addition of the Uniform Building Code;
- Health and Safety Code, section 25500 et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code, sections 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

LOCAL

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

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

Similarly, the Uniform Fire Code (UFC) Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United States' premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition. The City of San Jose Fire Department is the administering agency for the 2000 Uniform Fire Code.

Applicable local (or locally enforced) requirements include:

- 2001 Edition of California Fire Code and all applicable NFPA standards (Cal. Code Regs., tit. 24, Part 9);
- California Building Code Title 24, California Code of Regulations (Cal. Code Regs., tit. 24, § 3 et seq.).
- Uniform Fire Code, 2000

SETTING

The LECEF project site is located in San Jose, Santa Clara County, California at 800 Thomas Foon Chew Way. The facility (Phases 1 and 2) is located within a 21-acre project site. The project site is contained within a 34-acre project parcel that also includes a vacant 13-acre parcel to the south of the project site that will be used for laydown and worker parking during the construction of Phase 2.

The project parcel is immediately north of State Route 237 and east of Zanker Road. To the east are an agricultural field, Coyote Creek, and the City of Milpitas. Immediately to the north of the parcel is a parcel owned by Silicon Valley Power (SVP) for a planned 230 kV switching station. North of the SVP parcel is the existing PG&E Los Esteros Substation. West and further north of the project site are open and undeveloped buffer lands surrounding the San Jose/Santa Clara Water Pollution Control Plant (WPCP). The WPCP is northwest of LECEF. Further north are the WPCP sludge drying ponds and yards. Site topography is characterized as generally flat with rolling foothills to the east. The terrain elevation is approximately 15 feet above mean sea level. The overall terrain in the vicinity is level. See **Project Description** in this Staff Assessment for more details.

Fire support services to the site would be under the jurisdiction of the City of San Jose Fire Department. The closest fire station is Fire Station #25, located at 1590 Gold Street in Alviso, approximately 2.5 miles away. The response time to the project site is estimated to be 3 to 4 minutes. Backup fire support, if needed, would come from Fire Station #29, located at 199 Innovation Drive, in San Jose, which is approximately 3 miles away, with an estimated response time of 6 to 7 minutes. (Allyn 2004).

The City of San Jose Hazardous Materials Team is assigned as the off-site hazardous materials first responder for the LECEF Phase 2. Hazmat response would come from the fire station located at 199 Innovation Drive, in San Jose, approximately 3 miles away. Their response time is estimated to be 6 to 7 minutes (Allyn 2004).

IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed project would be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the LECEF Phase 2 to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers would be adequately protected from health and safety hazards.

FIRE HAZARDS

During construction and operation of the proposed Phase 2, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS would be adequate to assure protection from all fire hazards. The City of San Jose Fire Department has stated that it is adequately equipped and staffed to respond to an on-site fire within 3 to 4 minutes or less (Allyn 2004).

APPLICANT'S PROPOSED MITIGATION

WORKER SAFETY

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

Construction Safety and Health Program

The LECEF Phase 2 encompasses construction and operation of additions to a natural gas fired facility having ancillary facilities such as transmission lines and pipelines. Workers would be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at Title 8, California Code of Regulations, section 1502 et seq. These requirements are promulgated by Cal/OSHA and are applicable to the construction phases of the project. The Construction Safety and Health Program would include the following:

- Construction Injury and Illness Prevention Program (Cal. Code Regs., tit. 8, § 1509);
- Construction Fire Protection and Prevention Plan (Cal. Code Regs., tit. 8, § 1920); and
- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 1514 - 1522).

Additional programs under General Industry Safety Orders (Cal. Code Regs., tit. 8, §§ 3200 - 6184), Electrical Safety Orders (Cal. Code Regs., tit. 8, §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal. Code Regs., tit. 8, §§ 450 - 544) would include:

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;
- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;

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

The AFC includes adequate outlines of each of the above programs. Prior to construction of the LECEF Phase 2, detailed programs and plans would be provided pursuant to the condition of certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Upon completion of construction and prior to operations at the LECEF Phase 2, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following programs and plans:

- Injury and Illness Prevention Program (Cal. Code Regs., tit. 8, § 3203);
- Emergency Action Plan (Cal. Code Regs., tit. 8, § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (Cal. Code Regs., tit. 8, § 3221); and
- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (Cal. Code Regs., tit. 8, §§ 3200 - 6184), Electrical Safety Orders (Cal. Code Regs., tit. 8, §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal. Code Regs., tit. 8, §§ 450 - 544) would be applicable to the project. Written safety programs, which the applicant would develop, for the LECEF Phase 2 project would ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (LECEF 2003, Page 8.16-6). Prior to operation of the LECEF Phase 2 project, all detailed programs and plans would be provided pursuant to Condition of Certification **WORKER SAFETY-2**.

Safety and Health Program Elements

The applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program (LECEF 2003, Sections 8.16.3.1 and 8.16.3.2). The measures in these plans are derived from applicable sections of state and federal law. The major items required in both construction and operation Safety and Health programs are as follows:

Injury and Illness Prevention Program (IIPP)

The applicant would submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction and operation of the project.

The IIPP would include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and
- A training program for introducing the program; for new, transferred, or promoted employees; for new processes and equipment; for supervisors; for contractors.

Emergency Action Plan

California regulations require an Emergency Action Plan (Cal. Code Regs., tit. 8, § 3220). The AFC contains a satisfactory outline for an emergency action plan (LECEF 2003, Page 8.16-6).

The outline lists the following features:

- Purpose and Scope of Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;

- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;
- Hazard Communication;
- Spill Containment and Reporting;
- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (Cal. Code Regs., tit. 8, § 3221). The AFC describes a proposed fire prevention plan which is acceptable to Staff (LECEF 2003, Page 8.16 -10). The plan would include the following topics:

- General Requirements;
- Fire Hazard inventory, including ignition sources and mitigation
- Housekeeping and proper materials storage
- Employee alarm/communication system
- Portable fire extinguishers
- Fixed firefighting equipment
- Fire control
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of liquids
- Training
- Personnel to contact for information on plan contents

Staff proposes that the applicant submit a final Fire Protection and Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) for review and approval and to the City of San Jose Fire Department for review to satisfy proposed conditions of certification **WORKER SAFETY-1** and **-2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are encountered which, due to process, environment,

chemicals or mechanical irritants can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (Cal. Code Regs., tit. 8, §§ 3380-3400). The LECEF Phase 2 project operational environment would require a PPE program.

Information provided in the AFC indicates that all employees required to use PPE would be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment would meet National Institute for Occupational Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and would carry markings, numbers, or certificates of approval. Respirators would meet NIOSH and California Department of Health and Human Services Standards. Each employee would be provided with the following information pertaining to the protective clothing and equipment:

- proper use, maintenance, and storage;
- when the protective clothing and equipment are to be used;
- benefits and limitations; and
- when and how the protective clothing and equipment are to be replaced.

A PPE program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program.

Operations and Maintenance Written Safety Program

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

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

Operations and Maintenance Safety Training Programs

Employees would be trained in the safe work practices described in the above-referenced safety programs.

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (LECEF 2003, Section 8.16) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area.

The project would rely on both on-site fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required from the City of San Jose Fire Department.

During construction, an interim fire protection system would be in place. The permanent facility fire protection system would be placed in service as early as possible during the construction phase.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Staff agrees that the project will indeed meet all requirements. Elements include both fixed and portable fire extinguishing systems.

The applicant will be required to provide the final Fire Protection and Prevention Program to Staff and to the City of San Jose Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed prior to closure to incorporate these requirements.

CUMULATIVE IMPACTS

Staff reviewed the potential for the construction and operation of the LECEF Phase 2 project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City of San Jose Fire Department and found that cumulative impacts were insignificant. There are few industrial facilities in this agricultural area, with the exception of the WPCP. Captain Karen Allyn confirmed that the City of San Jose Fire Department is adequately staffed and equipped to control whatever fire could occur at an industrial facility of this type, and the department's response time will be adequate (Allyn. 2004). Staff also finds that the fire-fighting response time is no greater than is typical for other California power plants previously certified by the CEC.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

No comments have been received.

CONCLUSION AND RECOMMENDATIONS

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 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.

When the applicant provides a Project Construction Safety and Health Program and a Project Operations Safety and Health Program as required by Conditions of Certification **WORKER SAFETY-1** and **-2**, Staff believes that the project would incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. The Safety and Health Programs apply to all project-related construction and operations. Staff also concludes that the proposed project would not have significant impacts on local fire protection services. If the Energy Commission certifies the project, Staff recommends the adoption of the following proposed Conditions of Certification. The proposed Conditions of Certification provide assurance that the Construction Safety and Health Program and the Operations Safety and Health Program proposed by the applicant would be reviewed by the appropriate agencies before implementation.

The conditions also require ***verification*** that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS. In order to reduce and/or eliminate the recurrence of the earlier described hazards which have been found by Staff audits, it is necessary for the Energy Commission to have a safety professional monitor the on-site compliance with Cal-OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. 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 all 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. Added Conditions of Certification, **WORKER SAFETY-4 & 5,** assure that the worker safety and health plans are properly implemented and monitored during the construction and commissioning phases of the project.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing:

- Construction Injury and Illness Prevention Program;
- Construction Safety Program;
- Construction Personal Protective Equipment Program;
- Construction Exposure Monitoring Program;
- Construction Emergency Action Plan; and
- 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 San Jose Fire Department for review and comment prior to submittal to the CPM. The Project Construction Safety and Health Program shall be consistent with and implemented in accordance with all requirements of Title 8, California Code of Regulations.

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 Safety and Health Program. The project owner shall provide a letter from the City of San Jose Fire Department stating that they have reviewed and commented on the Construction Fire Protection and Prevention Plan and 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:

- Operation Injury and Illness Prevention Plan;
- Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (Cal. Code Regs., tit. 8, § 3221); and;

- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, to be available for their review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of San Jose Fire Department for review and comment. The Operations and Maintenance Safety and Health Program shall be consistent with and implemented in accordance with all requirements of Title 8, California Code of Regulations.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

WORKER SAFETY-3: The project owner shall prepare and submit to the CPM an Operations Fire Prevention Plan describing the onsite fire protection system that will be provided in this project. Specifically, information must be included on employee alarm/communication system, portable fire extinguisher placement and operation, fixed fire fighting equipment placement and operation, fire control methods and techniques, flammable and combustible liquid storage methods, methods for servicing and refueling vehicles and fire prevention training programs and requirements. Additionally, information should be provided regarding the source of the onsite firewater, including storage if applicable and fire department hook-ups.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the City of San Jose Fire Department a copy of the final version of the Operations Fire Prevention Plan for review and comment and to the CPM for review and approval.

WORKER SAFETY-4 The project owner shall employ a CPM approved Safety Monitor, who will report directly to the Chief Building Official (CB0), and who will be responsible for verifying that the Construction Safety Supervisor, as required in **Worker Safety-5**, implement all appropriate Cal/OSHA and Commission safety requirements specified in the Decision.

The CPM approved Safety Monitor shall conduct a site safety inspection at least once a week during construction of permanent structures, and commissioning, of the power plant unless a lesser number of inspections are approved by the CPM. The CPM may also require similar inspections concerning linear facilities.

The Safety Monitor shall keep the Chief Building Official (CBO) fully informed regarding safety related matters and coordinate with the CBO concerning on-site safety inspections, and a final safety inspection prior to issuance of the Certificate of Occupancy by the CBO. The Safety Monitor will be retained

until cessation of construction and commissioning activities, and issuance of the Certificate of Occupancy, unless otherwise approved by the CPM.

The Safety Monitor(s) shall also:

- Inform the site Construction Safety Supervisor and CBO of any construction or commissioning problems that could pose a future danger to life or health.
- After consultation with the CBO, have the authority to temporarily stop construction or commissioning activities involving possible safety violations or unsafe conditions that may pose an immediate or future danger to life or health, until the problem is resolved to the satisfaction of the Safety Monitor and CBO.
- Consult with the CBO and Construction Safety Supervisor to determine when construction may resume unless the problem is corrected immediately, and to the satisfaction of the Safety Monitor and/or CBO.
- Inform the CPM within 24 hours of any temporary halt in construction or commissioning activities.
- Be available to inspect the site whenever necessary in addition to the minimum weekly basis during construction and commissioning as determined in consultation with the CBO and CPM.
- Verify that the safety program for the project complies with Cal/OSHA & federal regulations related to power plant projects.
- Verify that all federal and Cal/OSHA requirements are practiced during the construction and installation of all permanent structures (including safety aspects of electrical installations).
- Verify 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.
- Verify that all the plans identified in **Worker Safety-1** are implemented.

The Safety Monitor shall be qualified regarding the following:

- Safety issues related to pipeline construction, construction equipment, and procedures, etc,
- LORS applicable to workplace safety and worker protection
- Workplace hazards typically associated with power production
- Lock-out / tag-out and confined spaces control systems

Verification: The project owner shall submit the Safety Monitor(s) resume(s) to the CPM for approval at least 30 days prior to site mobilization. One or more individuals may hold this position.

The Safety Monitor 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 that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health;
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-5 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 specific operations, and has authority to take appropriate action. This CSS shall have over-all authority for coordination and implementation of all occupational safety and health practices, policies, and programs.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and qualifications of the CSS for review and approval.

REFERENCES

2001 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

Allyn, Karen. Captain, Bureau of Field Operations, City of San Jose Fire Department. Personal communication, July 29, 2004.

LECEF, LLC (Los Esteros Critical Energy Facility, LLC). 2003. Los Esteros Critical Energy Facility Application for Certification, Phase 2 Relicense and Phase 2 Combined-Cycle Conversion (03-AFC-2). December 30, 2003.

ENGINEERING ASSESSMENT

FACILITY DESIGN

Testimony of Kevin Robinson and Steve Baker

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the engineering LORS and any special design requirements.

Subjects discussed in this analysis include:

- identification of the engineering LORS applicable to facility design;
- evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- conditions of certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

Calpine Corporation proposes the conversion of the existing Los Esteros Critical Energy Facility (LECEF) simple cycle facility to a nominally rated 320 megawatt (MW) combined cycle power plant known as the LECEF Phase 2. The project is located in the City of San Jose, Santa Clara County. The site will occupy approximately 21 acres of a 34 acre parcel within the City of San Jose and will lie in seismic zone 4 (as delineated by the California Building Standards Code). For more information on the site and related project description, please see the **Project Description** section of this document. References to "the City" and "the County" designate the City of San Jose and Santa Clara County, respectively. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices 10-A through 10-D (LECEF 2003a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (LECEF 2003a, Appendices 10-A through 10-D). Some of these LORS include the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Welding Society (AWS).

ANALYSIS

The basis of this analysis is the applicant's analysis, proposed construction methods, and the list of engineering LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendices 10-A through 10-D for a representative list of applicable industry standards), design practices and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, would most likely comply with all applicable site preparation LORS, and proposes conditions of certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials, or may become potential health and safety hazards if not constructed according to the applicable engineering LORS. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect at the time design and construction of the project actually commences. Existing structures and equipment need not be

upgraded to the current edition of applicable codes. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 2001 CBSC is in effect, the 2001 CBSC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Condition of Certification **STRUC-1** (below), which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

PROJECT QUALITY PROCEDURES

The AFC (LECEF 2003a, §§ 2.7.5, 2.7.5.2) describes a project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this quality assurance/quality control (QA/QC) program would ensure that the project is actually designed, procured, fabricated, and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and to ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, either the City or the County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed conditions of certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. Those elements of construction that are not difficult to reverse are allowed to proceed without approval of the plans. The applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's subsequent plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.
2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.
3. The conditions of certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.
4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The conditions of certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;
2. The project be designed and built to the 2001 CBSC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the ~~1998~~2001 California Building Standards Code (CBSC)(also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy code, California Fire Code, California Code of Building Conservation, California Reference Standards Code,,[1] and all other applicable engineering LORS in

[1] ~~The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).~~

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 insure that all the provisions of the above applicable codes be enforced during any construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility [2001 CBC, Section 101.3, Scope]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification ~~**TSE-1, TSE-2 and TSE-3**~~ in the **Transmission System Engineering** Section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the ~~1998~~2001 CBSC is in effect, the ~~1998~~2001 CBSC 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.

The project owner shall insure that all contracts with contractors, subcontractors and supplies shall clearly specify that all work performed and materials supplied on this project comply with the codes listed above.

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 LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [~~1998~~2001 CBC, Section 109 – Certificate of Occupancy.][2]

Once the Certificate of Occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility which may require CBO approval for the purpose of complying with the above stated codes. The CPM will then determine the necessity of CBO approval on the work to be performed.

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 preliminary 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.

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[2] ~~Unless otherwise indicated, all day limitations are can be adjusted with the agreement of the project owner and the CBO or the CPM as appropriate.~~

Verification: At least ~~60~~30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the preliminary 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, as applicable, 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 Generator Foundation and Connections	4
SCR Unit Structure, Foundation and Connections	4
Transformer Foundation and Connections	4
CT Inlet Air Filter/Duct Structure, Foundation and Connections	4
Inlet Air Chillers Skid Foundation and Connections	4
Exhaust Stack Structure, Foundation and Connections	4
Fuel Gas Filter Foundation and Connections	4
Fuel Gas Compressor Foundation and Connections	1
Gas Turbine Enclosures Structure, Foundation and Connections	4
Potable Water Tank Foundation and Connections	1
Ammonia Storage Tank & Pump Foundation and Connections	1
Cooling Tower Foundation and Connections	1
Lube Oil Storage Room Structure, Foundation and Connections	1
Starting Hydraulic Skid Foundation and Connections	4
Performance Skid Foundation and Connections	4
Demineralized Water Filter Skid Foundation and Connections	4
Auxiliary Water Injection Pumps Foundation and Connections	4
Air Compressor/Air Dryer Foundation and Connections	1
Oil/Water Separator Foundation and Connections	2
Wash Water Drain Tank Foundation and Connections	2
Ammonia Vaporizer Skid Foundation and Connections	4
Switchgear Building Structure, Foundation and Connections	1
Black Start Generator Foundation and Connections	1
Fire Water Tank Foundation and Connections	1
Fuel Gas Metering Station Structure, Foundation and Connections	1
Fire Water Primary and Emergency Pump Foundation and Connections	1
Auxiliary Cooling Water Pump Foundation and Connections	1
Service/Administration Building Structure, Foundation and Connections	1
Switchyard Control Room Structure, Foundation and Connections	1
115-kV Switchyard Building Structure, Foundation and Connections	1

Equipment/System	**Quantity (Plant)**
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator (STG) Foundation and Connections	1
Steam Condenser and Auxiliaries Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	4
HRSG Feed Pumps Foundation and Connections	4
STG Unit Auxiliary Transformer Foundation and Connections	1
STG Power Distribution Center Structure, Foundation and Connections	1
STG Main Transformer Foundation and Connections	1
Condensate Pumps Foundation and Connections	2
Circulating Water Pumps Foundation and Connection	2
Condensate Storage and Transfer System Foundation and Connections	1
Boiler Feed Water Pump Foundation and Connections	2
Cooling Tower Structure, Foundation and Connections	1
Cooling Tower Blowdown Storage Tank, Foundation and Connections	1
Circulating Water Chemical Feed System Foundation and Connections	1
Aqueous Ammonia Storage Tank Foundation and Connections	1
Equipment Cooling Water Heat Exchanger Foundation and Connections	1
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	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 ~~1998~~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 ~~**TSE-1, TSE-2 and TSE-3**~~ in the **Transmission System Engineering** Section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress <u>of work requiring CBO design review and inspection</u> to ensure compliance with LORS;
2. Ensure that construction of all the facilities <u>subject to CBO design review and inspection</u> 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 project owner and CBO approved alternative timeframe) 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 soils engineer, or a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: D) 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~~E) a mechanical engineer; and ~~E~~F) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California.]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification ~~**TSE-1, TSE-2 and TSE-3**~~ in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, 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 engineers assigned to the project. [~~1998~~2001 CBC, Section 104.2, Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and

approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the Foundation Investigation Report, Geotechnical Report or Soils Report prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

2. 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

3. 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 soils engineer, 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 Foundation Investigations Report, Geotechnical Report or Soils Report containing field exploration reports, laboratory tests and engineering analysis detailing the nature and extent of the soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load [2001 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations];~~Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;~~

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the ~~1998~~2001 CBC, Appendix Chapter 33, Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both); and

4. Recommend field changes to the civil engineer and RE;

5. ~~Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of~~

~~the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and~~

6. ~~Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18, section 1804, Foundation Investigations.~~

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [~~1998~~2001 CBC, section 104.2.4, Stop orders.]

C: The engineering geologist (or soils engineer) shall:

1. Review all the engineering geology reports and prepare final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both).

D: 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.

E: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

F: 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 project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, ~~the names, qualifications~~ resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering

geologistengineers 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.

At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible 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,resume 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 19982001 CBC, Chapter 17 [Section 1701, Special Inspections; Section, 1701.5 Type of Work (requiring special inspection)]; and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification **TSE-1, TSE-2 and TSE-**3 in the **Transmission System Engineering** Section of this document.

The special inspector shall:

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 [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days (or project owner and CBO approved alternative timeframe)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 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 the corrective action required [2001 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities or the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: ~~The project owner shall submit monthly construction progress reports to the CBO and CPM.~~ The project owner shall transmit a copy of the CBO's approval ~~or disapproval~~ of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report.~~within 15 days.~~ If any corrective action is ~~If~~ disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work 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~~after obtaining the CBO's final approval. ~~The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections.]~~ The project owner shall retain one set of approved engineering plans, specifications and calculations (including all approved changes) 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, Geotechnical Report of Foundation Investigations Report ~~as~~ required by the ~~1998~~2001 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report Section 3309.6, Engineering Geology Report, and Chapter 18, Section 1804, Foundation Investigations].

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, 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~~24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within ~~five days~~24 hours of the CBO's approval~~, the project owner shall provide to the CPM a copy of the CBO's approval~~ to resume earthwork and construction in the affected areas, 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 shall be subject to inspection by the CBO and the CPM.

If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM [2001 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, 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 for review and approval. 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~~work, the project owner shall obtain the CBO's approval of the final ~~"as-graded"~~ grading plans (including final changes), ~~and final "as-built" plans~~ for the erosion and sedimentation control ~~facilities~~work. The civil engineer shall state that the work within his/her area of responsilibility was done in accordance with the final approved plans [~~1998~~2001 CBC, Section ~~109~~3318, Completion of Work~~Certificate of Occupancy~~.]

Verification: Within 30 days (or project owner and CBO approved alternative timeframe) of the completion of the erosion and sediment control mitigation and drainage ~~facilities~~work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and 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~~ the CBO's approval 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 **Facility Design 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 [~~1998~~2001 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures ~~at least 90 days (or a lesser number of days mutually agreed to by the project owner and the CBO),~~ prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [~~1998~~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.]; and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to the applicable LORS [2001 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 1** of Condition of Certification **GEN-2** above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM. ~~with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision~~.

~~If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.~~

The project owner shall submit to the CPM, in the next Monthly Compliance Report a copy of a statement from the CBO that the proposed structural plans, specifications,

and calculations have been approved and are in ~~conformance~~compliance 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 and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. 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 the requirements of that Chapter. ~~Occupancy Category 2 of the 1998 CBC.~~

Verification: At least 30 days (or project owner and CBO approved alternate timeframe) 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 **Facility Design 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:~~submit a signed and stamped statement to the CBO when:~~

~~1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and~~

~~2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and~~

~~installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:~~

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- 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 project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design 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 for 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.~~At least 30 days prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.~~

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 project owner and CBO approved alternative timeframe) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, the above listed documents~~final design plans, specifications and calculations~~, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall 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 any heating, ventilating, air conditioning (HVAC) or refrigeration~~that~~ system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the ~~applicable edition of the~~ CBC 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 project owner and CBO approved alternative timeframe) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations,

plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the ~~applicable edition of the~~ CBC and other applicable codes with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC ~~1998~~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 [~~1998~~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.

~~The following activities shall be submitted for CBO approval:~~

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 project owner and CBO approved alternative timeframe) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval of the above listed documents.~~final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater,~~ 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

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY

Dr. Patrick Pilling, P.E., G.E.

INTRODUCTION

The geology and paleontology section discusses potential impacts of the proposed conversion to combined-cycle configuration of the Los Esteros Critical Energy Facility Phase 2 (Phase 2) regarding geological hazards, geological (including mineralogical) and paleontological resources. Staff's objective is to ensure that there will be no unmitigated significant adverse impacts to significant geological and paleontological resources during project construction, operation and closure. A brief geological and paleontological overview of the project is provided. The section concludes with staff's proposed monitoring and mitigation measures with respect to geologic hazards and geologic, mineralogic, and paleontologic resources, with the inclusion of Conditions of Certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS are listed in the Application For Certification (AFC), in Section 8.4.5 and 8.8.6 of the AFC (LECEF, LLC, 2003). A brief description of the LORS for geological hazards and resources, and paleontological resources, follows:

FEDERAL

There are no federal LORS for geological hazards and resources, grading, or paleontological resources for the proposed project.

STATE AND LOCAL

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC), in particular Part 2, the California Building Code (CBC). The CBC includes a series of standards that are used in project investigation, design and construction (including grading and erosion control).

The "Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures" (Society of Vertebrate Paleontology, 1995) is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the Society of Vertebrate Paleontology (SVP), a national organization of professional scientists.

SETTING

REGIONAL AND SITE GEOLOGY

The proposed site was originally analyzed in 2001 prior to the construction of the 180 MW simple-cycle LECEF power plant (01-AFC-12; CEC 2001).

All proposed construction will occur within the 21-acre fenced area encompassing the simple-cycle facility, with staging and construction parking occurring on a 13-acre adjacent parcel south of the plant site. The Phase 2 site is located within the Coast Ranges geomorphic province at the northern end of the Santa Clara Valley. This area within the Coast Ranges is characterized by the San Francisco Bay, tidal marshes, and adjacent alluvial fans sloping upward away from the bay. Major geologic units present in the vicinity of the site include Quaternary alluvial deposits and the Jurassic Franciscan Complex (Iwamura, 1995; Norris and Webb, 1990; CDMG, 1990). The Quaternary alluvial deposits consist of gravels, stiff clays, loose clayey silts, and clayey sands. The Franciscan Complex consists of a melange assemblage of sandstone, shale, chert, greenstone, and serpentinite due to the tectonics associated with a subduction zone.

Exploration at the site generally encountered variable sandy clay and silty clay, with thin interbedded sand and clayey silt layers. The sandy clay and silty clay classified as brown to grayish-brown, medium stiff to very stiff, and as exhibiting low to medium plasticity. This material is considered as exhibiting low to moderate expansion. The ground water is reported to exist approximately 6.5 to 19 feet below the existing ground surface (LECEF, LLC, 2003).

ANALYSIS AND IMPACTS

There are two types of impacts considered in this section. The first are geologic hazards, which could impact proper functioning of the proposed facility and include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, and tsunamis and seiches. The second considers potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

No federal LORS with respect to geologic hazards and geologic and mineralogic resources apply to this project; however, the CBSC and CBC provide geotechnical and geological investigation and design guidelines, which engineers must adhere to when designing a proposed facility. As a result, the criteria used to assess geologic hazard impact significance includes evaluating each potential hazard in relation to being able to adequately design and construct the proposed facility.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geologic hazards.
- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

With respect to impacts the proposed facility may have on existing geologic and mineralogic resources, geologic and mineral resource maps for the surrounding area have been reviewed, in addition to any site-specific information provided by the applicant, to determine if geologic and mineralogic resources are present in the area. When available, operating procedures of the proposed facility, in particular ground water extraction and mass grading operations are reviewed to determine if such operations could adversely impact such resources.

Staff reviewed existing paleontologic information for the surrounding area, as well as any site-specific information provided by the applicant, in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area. If present or likely to exist, conditions of certification are applied to project approval, which outlines procedures required during construction to mitigate impacts to potential resources.

GEOLOGIC HAZARDS

The AFC provides documentation of potential geologic hazards at the LECEF plant site, in addition to subsurface exploration information (LECEF, LLC, 2003). Review of the AFC, coupled with our independent research, indicates the potential for geologic hazards to impact the plant site are low.

Our independent research included review of available geologic maps, reports, and related data for the LECEF Phase 2 plant site. Geological information was available from the California Geological Survey (CGS), U. S. Geological Survey (USGS), and other governmental organizations.

Faulting and Seismicity

Energy Commission staff reviewed the California Division of Mines and Geology (CDMG) publication “Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions,” dated 1994 (CDMG, 1994), Maps of Known Active Fault Near-source Zones in California and Adjacent Parts of Nevada (International Conference of Building Officials [ICBO], 1998), the Alquist-Priolo Milpitas Special Studies Zone Map (CDMG, 1982), and the State of California Seismic Hazard Zones Map, Milpitas Quadrangle (CGS, 2004). The project is located within Seismic Zone 4 as delineated on Figure 16-2 of the CBC. The Coyote Creek fault crosses the proposed LECEF Phase 2 site and proposed linear improvements. However, since the Coyote Creek fault is not Holocene in age, it is not considered an active or potentially active fault. The closest known Holocene fault is the Hayward Fault, located approximately 1.9 miles east of the site. Staff estimates a deterministic peak horizontal ground acceleration for the project would be on the order of 0.6g to 0.7g. This estimate is based upon a moment magnitude 7.5 earthquake on the Hayward Fault.

Liquefaction

Liquefaction is a nearly complete loss of soil shear strength that can occur during a seismic event. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, effectively reducing the internal strength of the soil.

This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) and very soft silts lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic settlements of overlying structural improvements and lateral spreading of the liquefied layer when confined vertically but not horizontally. Soil borings contained in the AFC indicate ground water is most likely present at depths between 6.5 and 19 feet below existing grade (LECEF, LLC, 2003). The borings also indicate the site is underlain by sandy to silty clay soils to the depths explored (60 feet). The applicant has previously identified a potentially liquefiable sand layer approximately 23 feet from the ground surface in the vicinity of this project (CEC, 2001). Staff have verified this layer is likely susceptible to liquefaction; however, impacts to the surface and proposed structures is considered low due to the presence of over 20 feet of overlying, non-liquefiable clay soils. Based on the depth of this layer in relation to any free-face exposure in the area, the potential for lateral spreading is considered low.

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. Since the site is underlain by clay and silt soils, the potential for dynamic compaction is negligible.

Hydrocompaction

Partially saturated soils can possess bonds that are a result of chemical precipitates that accumulate under semi-arid conditions. Such soluble compound bonds provide the soils with cohesion and rigidity; however, these bonds can be destroyed upon prolonged submergence. When destroyed, a substantial decrease in the material's void ratio is experienced even though the vertical pressure does not change. Materials that exhibit this decrease in void ratio and corresponding decrease in volume with the addition of water are defined as collapsible soils. Collapsible soils are typically limited to true loess, clayey loose sands, loose sands cemented by soluble salts, and windblown silts. Based on the nature and density of the existing native soils, hydrocompaction is not considered significant at the proposed LECEF site.

Subsidence

Ground subsidence is typically caused when ground water is drawn down by irrigation activities such that the effective unit weight of the soil mass is increased, which in turn increases the effective stress on underlying soils, resulting in consolidation/settlement of the underlying soils. Since ground water is generally present at a depth equivalent to sea level, and since LECEF Phase 2 will obtain water from the San Jose/Santa Clara Water Pollution Control Plant via a new water pipeline to the site, significant draw down of the water table is not anticipated. As a result, the potential for ground subsidence is considered low.

Expansive Soils

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure which, in turn, causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. The sandy to silty clay soils exhibit a low to moderate potential to expand with an increase in moisture content. As a result, mitigation of clay soils will be necessary and will include overexcavation of these soils below medium to light-weight structures, and possibly the use of deep foundations for heavy structures.

Landslides

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that are usually implemented by an increase of the material's moisture content above a layer which exhibits a relatively low strength. Debris-flows are shallow landslides that travel downslope very rapidly as muddy slurry. Based on the staff's review of the site topography and geology as presented in the AFC (LECEF, LLC, 2003), the potential for landslides and debris-flows at the site is considered low.

Tsunamis and Seiches

Tsunamis and seiches are earthquake-induced waves that inundate low-lying areas adjacent to large bodies of water. The proposed site is situated approximately 15 feet above mean sea level and approximately 6 miles inland from the San Francisco Bay. For a locally derived tsunami to occur, significant vertical fault movement beneath the San Francisco Bay would be required. A fault of this type has not been documented beneath the San Francisco Bay. Because of the site's location at the southern end of the San Francisco Bay relative to the bay's westward entrance to the Pacific Ocean, a tsunami generated by a distant earthquake should have an insignificant potential to impact the site. As a result, the potential for tsunamis and seiches to affect the site is considered negligible.

GEOLOGICAL, MINERALOGICAL, AND PALEONTOLOGICAL RESOURCES

Energy Commission staff have reviewed applicable geologic maps for this area (CDMG, 1990). Based on this information and the information contained in the AFC (LECEF, LLC, 2003), there are no known geological or mineralogical resources located at or immediately adjacent to the proposed LECEF site. A paleontological resources field survey and sensitivity analysis was conducted by the applicant's consultant for the proposed Phase 2 project and the proposed linear facility improvements to support the project. No significant fossil fragments were identified. However, several paleontological localities are present near the site in the same geologic formation present at the site. As a result, the proposed Phase 2 project site may contain significant paleontological resources such that mitigation procedures will be necessary (see Conditions of Certification **PAL-1** through **PAL-6)**.

PROJECT SPECIFIC IMPACTS

Seismicity represents the main geologic hazard at this site. Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the Facility Design section should mitigate these impacts to a less than significant level.

No geologic or mineralogic resources are known to exist in the area. Although no paleontological resources have been documented in the area, the (confidential) Paleontologic Resources Report (LECEF, LLC, 2003) assigns a sensitivity rating of high for geologic units that underlie the proposed facility. Since the proposed project will include significant amounts of grading and utility trenching, staff considers the probability that paleontologic resources will be encountered during mass grading of the LECEF site to be high based on SVP assessment criteria. Conditions of Certification **PAL-1** to **PAL-6** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

CUMULATIVE IMPACTS

The LECEF site lies in an area that exhibits low geologic hazards and no known geologic or mineralogic resources. However, paleontogical resources could be encountered during construction. The potential impacts to paleontological resources due to construction activities will be mitigated as required by Conditions of Certification **PAL-1 to PAL-6.**

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 proposed project, is low.

FACILITY CLOSURE

A definition and general approach to closure is presented in the **General Conditions** section of this assessment. Facility closure activities are not anticipated to impact geologic, mineralogic, or paleontologic resources. This is due to the fact that no such resources are known to exist at the proposed project site. In addition, decommissioning and closure of the power plant should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed in plant decommissioning and closure will have been disturbed during construction and operation of the facility.

CONCLUSIONS AND RECOMMENDATIONS

The applicant will be able to comply with all 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 adoption of the proposed conditions of certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

PAL-1 Prior to ground disturbance, the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least 10 days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

The PRS shall obtain qualified paleontological resource monitors to monitor as necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

1) BS or BA degree in geology or paleontology and one year experience monitoring in California; or

2) AS or AA in geology, paleontology or biology and four years experience monitoring in California; or

3) Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: (1) At least sixty (60) 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, statement of qualifications, and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall approve or disapprove of the proposed paleontological resource specialist.

(2) At least twenty (20) days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

(3) At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to site mobilization, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

Protocol: The project owner shall develop a Paleontological Resources Monitoring and Mitigation Plan in accordance with the guidelines of the Society of Vertebrate Paleontologists (SVP, 1994) that shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence and procedures for~~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, a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;

- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined.
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- A discussion of the i~~I~~nventory, preparation, and delivery of fossils for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and,
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least forty-five (45) days prior to the start of construction, the project owner shall provide the CPM with a copy of the Paleontological Resources Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the ground disturbance, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare, and the owner shall conduct, CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, provide good quality photographs or physical examples of vertebrate fossils, explain the sensitivity and importance of these resources, ~~and~~ the legal penalties and obligations to preserve and protect such resources and the ability of the PRS or PRM to halt construction.

The training shall also include the set of reporting procedures in a brochure that workers are to follow if paleontological resources are encountered during project activities.

The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern. Each worker shall sign a Certification of Completion WEAP form indicating that they have received the training. A sticker that shall be placed on hard hats indicating that environmental training has been completed shall be provided to each worker that has completed the training.

Verification: At least thirty (30) days prior to site mobilization, the project owner shall submit to the CPM for review and approval the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee-training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as provided in the Certification of Completion WEAP form at the end of these conditions~~appropriate~~.

PAL-4 The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.
2. PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources

conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the project report shall include a justification in summary as to why monitoring was not conducted.

Verification: The PRS shall submit the summary of monitoring and paleontological activities in the Monthly Compliance Report.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM. A signed contract or agreement with the PRS shall be provided to the CPM upon request. The project owner shall be responsible to pay any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of

the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report filed under confidential cover shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: Within ninety (90) days following completion of the analysis of the recovered fossil materials, the project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document.

Certification of Completion of Worker
Environmental Awareness Program
LOS ESTEROS CRITICAL ENERGY FACILITY 2
(03-AFC-2)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology and Biological Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in the Monthly Compliance Report.

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Cul Trainer: _____ Signature:_____Date: ___/___/____
PaleoTrainer: _____Signature:_____Date: ___/___/____
Bio Trainer: _____ Signature:_____Date: ___/___/____

REFERENCES

CBC (California Building Code). 1998

CBSC (California Building Standards Code), 2001

CDMG, 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale: 1:750,000.

CDMG, 1990. Geologic Map of the San Francisco – San Jose Quadrangle, Scale 1:250,000.

CDMG, 1982. Milpitas Special Studies Zone (Alquist-Priolo) Map, Scale 1:24,000.

California Geological Survey (CGS), 2004. State of California Seismic Hazard Zones, Milpitas Quadrangle, Preliminary Revised Map.

CEC (California Energy Commission) 2001. Staff Assessment for Los Esteros Critical Energy Facility Project (01-AFC-12). December 31, 2001.

ICBO (International Conference of Building Officials), 1998. Map of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

Iwamura, T.I., 1995. Hydrogeology of the Santa Clara and Coyote Valleys Groundwater Basins in Recent Geologic Studies in the San Francisco Bay Area, Sangines, E.M., Anderson, D.W., and Buising, A.V., eds. Pacific Section of the Society of Economic and Paleontologists and Mineralogists.

Norris, R.M. and Webb, R.W., 1990. Geology of California (second edition). John Wiley and Sons. New York. 365 pp.

SVP (Society for Vertebrate Paleontology), 1995. Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures.

POWER PLANT EFFICIENCY

Testimony of Shahab Khoshmashrab

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Los Esteros Critical Energy Facility Phase 2 Project (LECEF, Phase 2) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the project's consumption of energy would create a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

No federal, state, or local laws, ordinances, regulations and standards apply to the efficiency of this project.

SETTING

The applicant proposes to convert the Los Esteros Critical Energy Facility (LECEF) from the current simple-cycle configuration to a combined-cycle configuration. The new facility (LECEF Phase 2) would generate up to 320 MW of power (nominal net output) (LECEF 2003, AFC §§ 1.1, 2.1, 2.4). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.) The current LECEF consists of four General Electric LM6000 Sprint combustion turbine (CT) generators with inlet air chillers producing up to 45 MW each (nominally), for a total of 180 MW. The gas turbines are equipped with water spray intercooling for power augmentation, and with water injection, selective catalytic reduction (SCR) and oxidation catalysts to control air emissions (LECEF 2003, AFC §§ 2.1, 2.3). As proposed, the LECEF Phase 2 would include the addition of four multi-pressure heat recovery steam generators (HRSGs) with duct burners, and a single multi-pressure, reheat, 140 MW (nominal) condensing steam turbine (ST) generator arranged in a four-on-one combined-cycle train (LECEF 2003, AFC §§ 1.1, 2.1, 2.4, 2.4.1, 2.4.1.1, 2.4.1.2). Natural gas to the LECEF is currently delivered by an existing 10-inch diameter, 550-foot long pipeline that is connected to both PG&E gas lines 101 and 109.

This gas supply line would also be used to provide the required gas supply for the LECEF Phase 2 (LECEF 2003, AFC §§ 1.1, 6.0, 6.1, 10.2.1).

ANALYSIS AND IMPACTS

CEQA Guidelines state that the environmental analysis "…shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

Project Energy Requirements And Energy Use Efficiency

Any power plant large enough to fall under Energy Commission jurisdiction will consume large amounts of energy. Under normal conditions, the LECEF Phase 2 would burn natural gas at a maximum rate of 55,265 million Btu per day, lower heating value (LHV) (LECEF 2003, AFC § 2.4.3). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, electricity will be generated at a full load efficiency of approximately 46 percent to 49 percent LHV depending on the amount of duct burning (LECEF 2003, AFC §§ 1.6.4, 10.3).

Under normal conditions, the LECEF currently burns natural gas at maximum rate of 43,243 million Btu per day LHV at an average fuel efficiency of 38 percent LHV (LECEF 2003, AFC §§ 1.6.4, 2.3.3, 10.3). Under the same conditions, the LECEF Phase 2 would burn natural gas at a maximum rate of 55,265 million Btu per day LHV at an average fuel efficiency of 46 percent with the HRSG duct firing (LECEF 2003, AFC § 1.6.4, 2.4.3, 10.3), an increase of 12,022 million Btu per day. Although the combined-cycle Phase 2 would require more natural gas supply than the existing simple-cycle LECEF, the resultant fuel efficiency would increase considerably, by at least eight percent, and the resultant power output would increase by 140 MW (nominally). In the existing competitive market, such an efficient power plant can be expected to displace power from less efficient plants. Therefore, even though Phase 2 would require

additional supply of energy, it would use it more efficiently than the simple-cycle LECEF, thus creating less impact on consumption of energy from available resources.

Adverse Effects On Energy Supplies And Resources

The Applicant has described its sources of supply of natural gas for the project (LECEF 2003, AFC §§ 1.1, 6.0, 6.1, 10.2.1). Natural gas to the LECEF is currently supplied from the existing PG&E gas distribution system from gas supply lines 101 and 109. These lines would also be used to provide the required gas supply for the combined-cycle Phase 2. The PG&E natural gas system has access to gas from the Rocky Mountains, Canada and the Southwest. This represents a resource of considerable capacity. Furthermore, the PG&E gas supply represents an adequate source for a project of this size. It is therefore highly unlikely that the project could pose a substantial increase in demand for natural gas in California.

Additional Energy Supply Requirements

Natural gas fuel will be supplied to the project by PG&E lines 101 and 109 via an existing 10-inch diameter, 550-foot long pipeline (2003, AFC §§ 1.1, 6.0, 6.1, 10.2.1). This is a resource with adequate delivery capacity for a project of this size. There is no real likelihood that the Phase 2 LECEF will require the development of additional energy supply capacity.

Compliance With Energy Standards

No standards apply to the efficiency of the combined-cycle Phase 2 or other non-cogeneration projects.

Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption

The LECEF could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

Project Configuration

As proposed for Phase 2, the LECEF will be configured as a combined-cycle power plant, in which electricity is generated by the existing four gas turbines, and additionally by an ST that operates on heat energy recuperated from the gas turbines' exhaust (LECEF 2003, AFC §§ 1.1, 2.1, 2.4, 2.4.1, 2.4.1.1, 2.4.1.2). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined-cycle power plant is increased considerably from that of either gas turbines or STs operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The gas turbines are currently equipped with water spray intercooling and inlet air chillers. As proposed in Phase 2, the LECEF would include the addition of HRSG duct

burners, multi-pressure HRSG and ST units, a deaerating surface condenser, a multi-cell cooling tower and a circulating water system (LECEF 2003, AFC §§ 1.1, 2.1, 2.3, 2.4). Staff believes these features contribute to meaningful efficiency enhancement to the LECEF. The four-train CT/HRSG configuration also allows for high efficiency during unit turndown because a single fully loaded CT is more efficient than two CTs operating at 50 percent load.

The LECEF Phase 2 includes HRSG duct burners, partially to replace heat to the ST cycle during high ambient temperatures when CT capacity drops, and partially as added power. Duct firing also provides a number of operational benefits, such as load following and balancing and optimizing the operation of the ST cycle.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The GE LM6000 Sprint turbine currently employed in the LECEF represents one of the most modern and efficient such machines now available. The applicant will configure the existing four GE LM6000 Sprint gas turbine generators in a four-on-one combined cycle power train.

Efficiency Of Alternatives To The Project

The project objectives include generation of additional electricity efficiently through the conversion of waste-heat to energy (LECEF 2003, AFC §§ 1.4, 9.0, 9.1.1, 9.6).

Alternative Generating Technologies

Alternative generating technologies are not considered for this project, since the development of the LECEF Phase 2 will involve the conversion of the current simple-cycle configuration to a combined-cycle configuration using the existing natural gas fueled technology.

Natural Gas-Burning Technologies

The current LECEF uses the GE LM6000 Sprint, one of the most modern simple-cycle gas turbine generators available. The LM6000 Sprint is further enhanced by the incorporation of spray intercooling (thus the name, SPRay INTercooling). This takes advantage of the aeroderivative machine's two-stage compressor. By spraying water into the airstream between the two compressor stages, the partially compressed air is cooled, reducing the amount of work that must be performed by the second stage compressor. This reduces the power consumed by the compressor, yielding greater net power output and higher fuel efficiency. The benefits in generating capacity and fuel efficiency increase with rising ambient air temperatures. At temperatures above 90°F, the Sprint machine enjoys a four percent increase in both power output and efficiency (GTW 2000). Alternative machines that can meet the project's objectives are not considered since the project's objectives include producing more electricity efficiently using the existing machines (LECEF 2003, AFC §§ 1.4, 9.0, 9.1.1, 9.5, 9.6). These gas turbines will operate in combination with a multi-pressure, reheat, condensing steam turbine generator (the most modern steam turbine technology applicable) adding 140 MW (nominal) of power without considerable additional fuel consumption, resulting in increase in the overall efficiency from 38 percent LHV (from the existing simple-cycle

configuration) to between 46 and 49 percent LHV (based on the amount of duct burning), a significant efficiency improvement.

Inlet Air Cooling

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to continue using the existing inlet air-chilling system (LECEF 2003, AFC §§ 2.3.1.1, 2.3.1.2, 2.4). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the Phase 2 project configuration (combined-cycle) and generating equipment chosen appear to represent the most efficient combination to satisfy the project objectives. There are no feasible alternatives that could significantly reduce energy consumption or produce additional electricity efficiently using the existing gas turbines.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the LECEF Phase 2 will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the LECEF Phase 2. The high efficiency of the proposed Phase 2 should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants, and thus not adversely impacting or even reducing the cumulative amount of natural gas consumed for power generation.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator to ensure the efficient

management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project, if constructed and operated as proposed, would generate a nominal 320 MW of electric power (net output), at an overall project fuel efficiency between 46 and 49 percent LHV. While the project will consume substantial amounts of energy, it will do so in the most efficient manner practicable. As the result of the conversion of the simple-cycle configuration to a combined-cycle configuration, the impact to energy resources from the additional fuel consumption will be balanced by the improvement in fuel efficiency and the additional electricity that will be produced by the project. The project will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

No Conditions of Certification are proposed.

REFERENCES

GTW (Gas Turbine World). 2003. Gas Turbine World Handbook, 2003, p. 80.

GTW (Gas Turbine World). 2000. ”LM6000 Sprint design enhanced to increase power and efficiency”, Gas Turbine World, July-August 2000, pp. 16-19.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

Power (Power Magazine). 1994. “Operating and maintaining IPP/cogen facilities,” Power, September 1994, p. 14.

POWER PLANT RELIABILITY

Testimony of Shahab Khoshmashrab

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Los Esteros Critical Energy Facility, LLC (Calpine) has predicted a 92 to 98 percent annual availability for the Los Esteros Critical Energy Facility Phase 2 Project (LECEF Phase 2) (see below), staff uses the benchmark identified above, rather than Calpine's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

SETTING

The responsibility for overseeing system reliability falls largely to the Western Electricity Coordinating Council (WECC), an entity that is responsible for coordinating and promoting electric system reliability throughout the nine western states. The WECC has reliability, operating, and planning standards, criteria and guidelines necessary to maintain the reliable operation of the Western Interconnection's interconnected bulk power system. As a member of the WECC, the applicant should adhere to the guidelines of the WECC and the North American Electric Reliability Council (NERC) in order to supply Calpine's customers with a reliable source of power.

As part of its plan to provide needed reliability, the applicant proposes to operate the 320 MW (nominal net output) LECEF Phase 2, providing power to its customers (LECEF 2003, AFC §§ 1.1, 2.4). The project is expected to operate at an overall availability of 92 to 98 percent (LECEF 2003, AFC § 2.4.1), and at a capacity factor, over the life of the plant, of 20 to 100 percent of maximum load (LECEF 2003, AFC § 10.2.2).

ANALYSIS AND IMPACTS

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (LECEF 2003, AFC § 10.2.2), the LECEF Phase 2 will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the LECEF Phase 2 will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

The applicant describes a QA/QC program (LECEF 2003, AFC § 2.7.5) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving

this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide appropriate redundancy of function for the combined cycle portion of the project (LECEF 2003, AFC §§ 2.4.2, 2.7.2). The fact that the project consists of four trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other trains to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency direct current (DC) and alternating current (AC) power systems will be supplied by redundant batteries, chargers, and inverters. Other balance of plant equipment will be provided with redundant examples.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as the LECEF Phase 2.

Maintenance Program

The applicant proposes to establish a preventive plant maintenance program typical of the industry (LECEF 2003, AFC § 2.7.5.2). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The LECEF Phase 2 will burn natural gas from the Pacific Gas and Electric (PG&E) distribution system. Natural gas to the existing simple cycle Los Esteros Critical Energy Facility (LECEF) is currently delivered by an existing 10-inch diameter, 550-foot long pipeline that is connected to both PG&E gas lines 101 and 109. This gas supply line will also be used to provide the required gas supply for the LECEF Phase 2 (LECEF 2003, AFC §§ 1.1, 6.0, 6.1, 10.2.1). This PG&E natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas. Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The existing LECEF obtains recycled water from the San Jose/Santa Clara Water Pollution Control Plant through the South Bay Water Recycling (SBWR) program, via a

1,500-foot long, 18-inch diameter pipeline. The SBWR has committed to providing recycled water for the LECEF Phase 2 operation via the same pipelines (LECEF 2003, AFC §§ 1.1, 2.4.4, 7.0). The applicant predicts average process make-up water consumption of approximately 952 gallons per minute (LECEF 2003, AFC §§ 2.4.4, 7.2.1). Potable water is currently trucked to the facility. The applicant plans to continue receiving truck deliveries to the LECEF 2 for potable water needs. Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves), and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) and flooding present credible threats to reliable operation.

Seismic Shaking

The site lies within Seismic Zone 4 (LECEF 2003, AFC §§ 2.6.1, 8.4.1.3, 8.4.1.4, 8.4.4.2; and as defined in the California Building Code); see that portion of this document entitled **Geology, Mineral Resources, and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (LECEF 2003, AFC §§ 2.6.1, 8.4.4.2, Appendix 10). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

Flooding

The project site lies at an elevation of 14 feet above mean sea level. However, it does not lie within either a 100-year or a 500-year floodplain (LECEF 2003, AFC §§ 2.6.1, 8.15.1.3). Staff believes there are no concerns with the power plant functional reliability due to flooding events. For further discussion, see **Soil and Water Resources**.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 1998 through 2002 (NERC 2003):

For Combined Cycle units (All MW sizes)

Availability Factor = 89.95 percent

The gas turbines employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor of 92 to 98 percent (LECEF 2003, AFC § 2.4.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new machines can well be expected to outperform the fleet of various (mostly older) gas turbines that make up the NERC statistics. Further, since the LECEF Phase 2 consists of four parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability, therefore, appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact power plant reliability. Reliability impacts on the electric system from facility closure, should there be any, are discussed in the **Transmission System Engineering** section of this document.

CONCLUSION

The applicant predicts an equivalent availability factor of 92 to 98 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the LECEF Phase 2 will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

REFERENCES

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

NERC (North American Electric Reliability Council). 2003. 1998-2002 Generating Availability Report.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Mark Hesters

SUMMARY OF CONCLUSIONS

Los Esteros Critical Energy Facility, LLC, the applicant, proposes to convert the existing simple-cycle 180 MW Los Esteros Critical Energy Facility to a 320 MW combined-cycle power plant in 2008 (Phase 2). The conversion would require expansion of the existing power plant switchyard by adding two 115/230 kV transformers and two new 200-foot 230 kV circuits connecting from the existing Los Esteros Critical Energy Facility switchyard to the new Silicon Valley Power (SVP) Switching Station recently constructed adjacent to and contiguous with Pacific Gas and Electric's Los Esteros Substation. All of the new Phase 2 transmission facilities would be constructed within the fenceline of the existing project except a short overhead section of the transmission line connecting to the SVP Switching Station. However, the interconnection of the Phase 2 to the new SVP Switching Station requires new circuit breakers and the expansion of the PG&E substation fence line to the south by 40X600 feet. Staff concludes that the switchyard, outlet lines and termination are acceptable and will comply with applicable Laws, Ordinances, Regulations and Standards. The results of the Updated Final System Impact Study for Phase 2 indicate that the operation of the project will not cause overloads on transmission facilities and will slightly reduce some pre-project overloads, thus improving system reliability. The Phase 2 project provides additional generation in a generation deficient area and will enhance local reliability and reduce transmission system losses.

The Updated Final System Impact Study includes an analysis of the interconnection of the simple-cycle 180 MW facility to the new SVP facility through the planned 115/230 kV step-up transformers planned for Phase 2. This interconnection would be required prior to synchronizing any of the converted combined-cycle power trains to the grid, and is a practical first-step in the phased conversion process described in the **Project Description** section of this FSA. There are no negative impacts identified from connecting the 180 MW Phase 1 project to the new SVP Switching Station at 230 kV in advance of the conversion to combined-cycle (PG&E, 2004b, p. 19).

INTRODUCTION

The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations, and standards (LORS), required for safe and reliable electric power transmission, and assesses whether or not the applicant has accurately identified all interconnection facilities required as a result of the project.

Staff's analysis evaluates the power plant switchyard, outlet lines, termination and downstream facilities identified by the applicant and staff and provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

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 (Cal. Code Reg., tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid. This evaluation must include any facilities beyond the project's interconnection with the existing transmission system, though such facilities are not under the permit authority of the Energy Commission, that are required as a result of the power plant addition to the California transmission system.

Because the Silicon Valley Power system is not a part of the California Independent System Operator (Cal-ISO) grid, the Cal-ISO is not directly responsible for ensuring electric system reliability for the generator interconnection and will not provide formal analysis and testimony for this project. Staff coordinates with the Cal-ISO, solicits and considers their input. Staff therefore has increased responsibility to evaluate the system reliability impacts of the project and provide conclusions and recommendations to the Energy Commission.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation, or use of overhead electric lines and to the public in general.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provide the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria include the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

- North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions. The NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO's Reliability Criteria also provide policies, standards, principles, and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid. It also applies when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO.

PROJECT DESCRIPTION

Phase 2 as used in this analysis refers to the conversion of the LECEF simple-cycle facility (Phase 1) to a combined-cycle power plant as proposed in the AFC (03-AFC-2). The Phase 2 project would be located within the fence line of the existing LECEF project site in San Jose. The existing generating facility consists of four combustion turbines (CTG), each with an output of approximately 45 MW (180 MW total) (see Definition of Terms), Phase 2 would modify Phase 1 by adding steam generation equipment in conjunction with one condensing steam turbine generator (STG) with an output of 140 MW. The LECEF output at completion of Phase 2 would be 320 MW. (LECEF 2004a, page 2-13). Phase 2 would begin operation in 2008.

The proposed Phase 2 project would expand the existing LECEF switchyard to include two short 230 kV connecting lines and two 115/230 kV transformers. The expanded switchyard would then connect to the SVP Switching Station through two 200-foot long three-phase single circuit 230 kV overhead transmission lines. Each of these transmission circuits would be sized to carry the output of the entire facility. The Phase 2 switchyard expansion and transmission lines would be built within the fenceline of the existing project except for a short section leading up to the SVP switchyard and will not require new rights-of-way. However, interconnecting Phase 2 to the SVP switching station will require circuit breakers between the SVP and PG&E facilities and expansion of the PG&E substation to the south by dimensions of 40X600 feet. This work will be completed with the construction of LECEF Phase 2, if required. When the interconnection of LECEF to the SVP Switching Station is completed Condition TSE-5g requires the existing Phase 1 tap interconnection to PG&E's Los Esteros Substation–Nortech 115 kV circuit and the supporting poles to be removed (LECEF 2004a, page 5-2).

EXISTING FACILITIES AND RELATED SYSTEMS

Both PG&E and SVP have been improving the transmission network in Santa Clara County and the surrounding region over the past several years. Improvements included the recently (2003) completed PG&E Los Esteros Substation, several new 115 kV lines and the adjacent switching station that SVP has constructed and plans to have operating in December of 2004. Two 230 kV lines connect the Los Esteros Substation to PG&E's Metcalf and Newark substations while one 230 kV line is planned to connect the SVP Switching Station to SVP's Northern Receiving Station. Four 115 kV transmission circuits connect the Los Esteros Substation to the Nortech, Trimble, Montague and Agnew substations. While the existing and future transmission system now meets, and would in the future meet system reliability criteria, increasing the output capacity of the LECEF as proposed in the AFC would provide a more robust system.

ANALYSIS

SYSTEM RELIABILITY

Introduction

For interconnecting a proposed generating unit to the grid, a System Impact Study and a Detailed Facility Study (DFS) are generally performed to determine the alternate and preferred interconnection methods. The studies also determine the downstream transmission system impacts, and the mitigation measures needed to conform with the system performance levels required by utility reliability criteria, NERC planning standards, WSCC reliability criteria, and Cal-ISO reliability criteria. The studies determine both positive and negative impacts and for the reliability criteria violations, determine the alternate and preferred additional transmission facilities or other mitigation measures. The studies are conducted with and without the new generation project and its interconnection facilities by using the computer model base case for the year the generator project would come on-line. The studies normally include a Load Flow study, Transient Stability study, Post-transient Load Flow study, and Short Circuit study. 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. The studies must be conducted under the normal condition (N-0) of the system and also for all credible contingency/emergency conditions, which includes the loss of a single system element (N-1) such as a transmission line, transformer, or a generator and the simultaneous loss of two system elements (N-2), such as two transmission lines or a transmission line and a generator. In addition to the above analysis, the studies may be performed to verify whether sufficient active or reactive power is available in the area system or area sub-system to which the new generator project would be interconnected.

New or modified downstream facilities that are a reasonably foreseeable consequence of approval of the project are analyzed from an engineering and environmental perspective but are not licensed by the Commission.

Scope of System Impact Study and Facilities Study Updated Final Report

The transmission system was analyzed under the following system conditions:

- 2008 Summer Peak Full Loop base case with 1-in-10 year peak load conditions for the South Bay Area (469 MW for SVP and 491 MW for PG&E's North San Jose area).
- 2008 Off-Peak Full Loop base case with loads approximately 50% of those used in the Summer Peak case.
- 2008 Summer Peak Full Loop base case with 1-in-10 year peak load conditions for the South Bay Area (469 MW for SVP and 491 MW for PG&E's North San Jose area) studying the existing (Phase 1) 180-MW simple cycle generator with the Phase 2 interconnection.
- 2008 Off-Peak Full Loop base case with loads approximately 50% of those used in the Summer Peak case studying the existing (Phase 1) 180-MW simple cycle generator with the Phase 2 interconnection.

The study included Load Flow analysis, PV analysis, Dynamic Stability Studies, and Short Circuit studies.

System Impact and Facilities Study Summary

Power Flow Study Results

The Power Flow Study results indicate that interconnection of the Phase 2 and Phase 1 with the Phase 2 interconnection cause no normal overloads in either the Summer or Off Peak analysis (PG&E 2004b, Pages 1 and 2). In all cases the impact of connecting the Phase 1, 180 MW simple-cycle with the Phase 2 SVP switching station interconnect configuration had impacts similar to or slightly less than the impacts of the interconnecting the 320 MW combined cycle facility.

Contingency studies of the 2008 Summer Peak case indicated an improvement in transmission system performance with the addition of the Phase 2. Before addition of the LECEF Phase 2, the single contingency analysis indicated 2 elements were overloaded. With the addition of the LECEF Phase 2, the overloading on these facilities was slightly reduced. There were no overloads identified in the off-peak study. (PG&E 2004b, Pages 1 and 2).

The overloaded elements for Phase 2 under N-1 contingencies include (PG&E 2004b, Pages 36-40):

Overloaded Facilities Under N-1 Contingency Summer Case (worst loading)	Percentage Loading of the Facility		Percentage Increment in Loading	SELECTED MITIGATION
	Pre-LECEF Phase 2	Post-LECEF Phase 2		
Piercy-Metcalf 115 kV line	106	105	-1	None needed
Metcalf-Moss Landing 230 kV lines	100	98	-2	

The System Impact and Facilities Study identified many n-2 contingency overloads without the project and the loadings on these lines were generally reduced by one or two percent by the addition of the Phase 2 project. For a complete listing of these preexisting overloads see pages 39-41 of the System Impact and Facilities Study.

Dynamic Stability Study Results

Dynamic stability studies for Phase 2 found no instabilities, all response plots were “well behaved” (Pacific Gas and Electric, System Impact and Facilities Study, Page 13).

Short Circuit Study Results

The short circuit studies were conducted to determine whether the Phase 2 project would result in overstressing the existing fault interruption rating of circuit breakers. The System Impact and Facilities Study showed that all of the existing circuit breakers are capable of handling the increase in fault level with the addition of the Phase 2 project (Pacific Gas and Electric, System Impact and Facilities Study, Page 14).

NOTEWORTHY PUBLIC BENEFIT[1]

The Phase 2 project slightly improves the reliability performance of the PG&E and SVP transmission systems and their ability to meet the NERC/WECC planning standards and Cal-ISO reliability criteria. Adding local generation such as the Phase 2 project would improve local area voltage support, provide real power locally, reduce pre existing overloads and reduce transmission system losses. The project thus provides “Public Benefits” by improving reliability.

CUMULATIVE IMPACTS

The Phase 2 project would connect to the SVP transmission network located near in the San Jose area of PG&E’s transmission network. Other projects that could cause cumulative impacts in conjunction with the LECEF would need to be located electrically near San Jose. Projects located near the LECEF include the permitted and under construction Metcalf Energy Center and the Russell Energy Center. The System Impact and Facilities Study for the Phase 2 Project indicates that system improvements in the area are needed (and currently planned) to mitigate existing n-1 and n-2 line overloads.

[1] Public Resources Code 25523 (h) requires the Commission to make a finding on Public Benefits including but not limited to environmental, economic and reliability.

The proposed project actually decreases these overloads, possibly indicating that more generation in the region could be beneficial, and provides a system benefit.

TRANSMISSION ALTERNATIVES

TRANSMISSION LINE ROUTE ALTERNATIVES

One alternative transmission interconnection was considered by the applicant. This was two short 115 kV underground circuits that would have terminated on PG&E's existing Los Esteros Substation. This alternative was not selected by the applicant due to increased cost. Staff considers the proposed termination acceptable.

FACILITY CLOSURE

PLANNED CLOSURE

Planned closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which in conjunction with applicable LORS, is considered sufficient to provide adequate safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the Transmission Owner (TO) to assure (as one example) that the TO's system would not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the transmission owner to maintain some power service via the outlet line to supply critical station service equipment or other loads.[2]

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan, that is in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities, would be

[2] These are merely examples, many more exist.

developed to assure safety and reliability (see **General Conditions Including Compliance Monitoring and Closure Plan**).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no comments from agencies or the public.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes as follows:

- Addition of the Phase 2 project does not cause any negative impacts on the PG&E or SVP transmission system.
- The Phase 2 project does not cause any normal condition overloads to the transmission grid. Under contingency conditions, the Phase 2 project reduces existing, pre-project overloads.
- The Phase 2 project switchyard and interconnection facilities will be adequate and reliable. The power plant switchyard, outlet lines, and termination are in accordance with good utility practices and are acceptable. Staff concludes that these facilities will comply with LORS, assuming the conditions of certification are met.
- Adding local generation such as the Phase 2 project would improve local area voltage support, provides real power locally, reduces pre-existing overloads and reduces transmission system losses. The project thus provides “Public Benefits” by improving reliability.
- The existing circuit breakers are capable of handling the increase in fault level with the addition of Phase 2.
- The interconnection of the Phase 2 project would result in the need for new circuit breakers at the Los Esteros Substation and the expansion of the substation by 2,400 square feet. The substation expansion is considered a reasonably foreseeable downstream impact of the Phase 2 project and select environmental disciplines will evaluate impacts and mitigation where applicable.
- The interconnection of the Phase 1 simple-cycle output to the new SVP Switching Station using the identical interconnection plan of the conversion project (Phase 2) has no negative impacts to the electrical system.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

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

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
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 The project owner shall keep the CBO informed regarding the status of engineering design and construction. If any discrepancy in design and/or construction is discovered 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 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", Cal-ISO standards, National Electric Code (NEC) and related industry standards.

b) Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

d) Termination facilities shall comply with applicable SVP interconnection standards.

e) The project conductors shall be sized to accommodate the full output from the project.

f) The project owner shall provide to the CPM:

i) Any Facility Study, Detailed Facility Study (DFS) or System Impact Study completed after December 2, 2004, including, if applicable, a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing,

ii) An executed project owner and Cal-ISO Facility Interconnection Agreement.

g) The project owner shall remove the overhead conductors of the existing tap line and remove the supporting poles.

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"[3] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

c)Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5 a)** through **g**) above.

d)The final DFS, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM and the CBO.

TSE-6 The project owner shall inform the CPM and CBO in writing of any impending changes, which may not conform to the requirements **TSE-5 a)** through **g)**, 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 in writing of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

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

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (Cal-ISO) and SVP 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 Cal-ISO a letter stating the proposed date of synchronization; and
2. At least one (1) business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the Cal-ISO letter to the CPM and SVP when it is sent to the Cal-ISO one (1) week prior to initial synchronization with the grid. The project owner shall contact the Cal-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 Cal-ISO shall be provided electronically to the CPM one (1) day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a)"As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

b)An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the 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.

CONDITIONS OF CERTIFICATION PER ENERGY COMMISSION ORDER 04-121-06

The Conditions of Certification TSE-A1 and TSE-A2 were required to certify continued use of the tap to the Los Esteros Substation-Nortech line for the original and the Phase 1 simple-cycle LECEF. These two conditions have been satisfied.

TSE-A1: The new temporary tap interconnection shall consist of an approximately 152 foot transmission line under-crossing of the two double circuit PG&E 115 kV steel pole lines (running generally North/South) immediately adjacent to the LECEF power plant switchyard to a hard wire tap of the Nortech-PG&E Los Esteros Substation circuit utilizing three wood poles. The cable size shall be 795 ACSS.

Verification: This configuration has been implemented and conforms to existing LORS.

TSE-A2: To provide adequate operational reliability and flexibility for the new temporary interconnection, a three-phase disconnect/selector switch shall be installed at the interconnection tap point with the Nortech-PG&E Los Esteros Substation 115 kV line to be coordinated between Calpine and PG&E. At the interconnection tap point the switch is required for the circuit to the Nortech Substation.

Verification: The three-phase disconnect/selector switch has been installed.

REFERENCES

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2003. Los Esteros Critical Energy Facility 2 Application for Certification (03-AFC-2). December 30, 2003.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004a. Data Adequacy Supplement to Application for Certification 03-AFC-2. March, 17, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

LECEF, LLC. (Los Esteros Critical Energy Facility, LLC) 2004b. Response to California Energy Commission Staff Data Requests 1-57. April 30, 2004.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

PG&E (Pacific Gas and Electric) 2004a. System Impact Study and Facilities Study Report: Silicon Valley Power/Calpine 230 kV Switching Station and LECEF Interconnection into PG&E's Los Esteros Substation (DRAFT). July 6, 2004.

PG&E (Pacific Gas and Electric) 2004b. System Impact Study and Facilities Study Report: Silicon Valley Power/Calpine 230 kV Switching Station and LECEF Interconnection into PG&E's Los Esteros Substation Updated Final Report. December 2, 2004.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

AAC All Aluminum conductor.

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

Ampere The unit of current flowing in a conductor.

Bundled Two wires, 18 inches apart.

Bus Conductors that serve as a common connection for two or more circuits.

Conductor The part of the transmission line (the wire) which carries the current.

Congestion Management
Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports), 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.

Loop An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar One megavolt ampere reactive.

Megavars Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)
A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)
A unit of power equivalent to 1,341 horsepower.

Multiple Contingencies
A condition that occurs when more than one major transmission element (circuit, transformer, circuit breaker, etc.) or more than one generator is out of service

Normal Operation/ Normal Overload
When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition
See Single Contingency.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis
A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power
Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)
A remedial action scheme is an automatic control provision, which, for instance, would trip a selected generating unit upon a circuit overload.

SF6 Sulfur hexafluoride is an insulating medium.

Single Contingency
Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable
Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

System Protection System
See Remedial Action Scheme.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating
See ampacity.

TSE Transmission System Engineering.

Undercrossing
A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild
A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Testimony of Robert Worl

INTRODUCTION

This section considers potential alternatives to the conversion and continued operation of the Los Esteros Critical Energy Facility power plant (LECEF) as a combined-cycle facility. LECEF is currently a 180 MW (195 MW gross output) simple-cycle power plant located in north San Jose, Santa Clara County. The conversion to combined-cycle operation would add 140 MW of generating capacity for a total output of 320 MW. The purpose of this alternatives analysis is to comply with California's environmental laws by providing an analysis of a reasonable range of feasible alternatives that could reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765).

Staff reviewed the Commission Decision and the Staff Assessment for the original LECEF project (01-AFC-12). Two alternative sites and alternative technologies to the project were considered at that time. Since the LECEF is already constructed and began commercial operation March 7, 2003, consideration of alternative sites and technologies were not considered in this analysis. A brief discussion of dry cooling is, however, provided for the purpose of clarifying why it was not considered a viable technology to be applied at the LECEF. The focus of this analysis is on the impacts of not approving the conversion to combined-cycle operation. This type of analysis is known as the No Project Alternative under CEQA.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations Section 15126.6(a), requires an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must address the No Project Alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The California Environmental Quality Act (CEQA) states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative (Cal. Code Regs., tit. 14, §15126.6(f)(3)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (City of Santee v. County of San Diego (4th Dist. 1989) 214 Cal. App. 3d 1438).

PROJECT OBJECTIVES

After studying the current Application for Certification (03-AFC-2), the Staff Assessment and Commission Decision in the original license proceeding (01-AFC-12) the Energy Commission staff has determined the Los Esteros Critical Energy Facility (LECEF) project objectives remain:

- to provide electrical energy in the deregulated power market;
- to be located near key infrastructure including transmission line interconnections, supplies of natural gas, and recycled water;
- add support and reliability to the North San Jose Transmission Reinforcement Project recently approved by the CPUC; and
- to provide a reliable source of energy for the future U.S. Dataport facility, mitigating the diesel-fueled reliable energy center in that original proposed development.

LECEF began commercial operation on March 7, 2003.

ANALYSIS OF ALTERNATIVE SITES AND TECHNOLOGIES

PROJECT SITE

The LECEF power plant is located at 800 Thomas Foon Chew Way in north San Jose, Santa Clara County, California.

ALTERNATIVE SITES

Two alternative sites were reviewed and rejected as being inferior during the original siting process for LECEF (CEC, 2001). The LECEF site itself was viewed as a preferred alternative site for the Metcalf Energy Center siting case approved by the Energy Commission in 2001. Because the project is already constructed and operating, no alternative sites were considered for the Phase 2 relicensing. To replace the additional 140 MW that the Phase 2 combined cycle project would generate would require construction of a peaking facility at a new location. This would have potential impacts to air quality, biological resources, public health, land use, and water resources requiring additional mitigation. In addition, a peaking facility at a new location would eliminate the efficiency benefits of using waste heat to produce steam to drive a steam turbine, and the increased efficiency of the power plant reducing the ratio of natural gas consumed per megawatt produced.

Conclusion Regarding The Existing Site

Staff believes that the mitigation already provided by LECEF, LLC, as supplemented by additional mitigation proposed by staff in this Final Staff Assessment (FSA), will sufficiently mitigate the impacts of the project to levels that are less than significant for all technical areas.

COOLING TECHNOLOGY ALTERNATIVES

Throughout the analysis process, questions have been asked about processes that would reduce the potential impacts to water resources from power plant cooling,

including impacts on the availability of recycled water for future uses in the region, and potential impacts to the quality of the WPCP product such as increased salinity, and decreased quality of the Santa Clara/San Jose Water Pollution Control Plant (WPCP) discharge back to the San Franciso Bay. The City of San Jose, Environmental Services Department, Watershed Protection (City) and Energy Commission staff have determined that the LECEF Phase 2 combined-cycle project will not have a significant negative impact on these parameters (see the **SOILS and WATER** technical section). Early analysis by staff considered the value of a zero liquid discharge system (ZLD). Other projects where water availability is critical have employed dry cooling technology. Since some discussion has occurred at workshops and hearings regarding these technologies and their potential for application to the LECEF Phase 2 project, a brief summary is included below. These descriptions are a summary of a more complete description of cooling technologies prepared as part of the analysis for the Blythe Energy Project, Phase II (02-AFC-1) by John Schoonmaker and John Kessler. This Appendix, Cooling Water Alternatives, is in Draft at this time.

Zero Liquid Discharge Alternative

Zero Liquid Discharge (ZLD) is principally a variation on the evaporative cooling system in which the residual blow-down water from the wet-cell cooling towers is filtered and processed for recirculation multiple times through the cooling system. The continued filtration and recirculation of the blow-down water essentially continues the evaporation eliminating the need for discharging the water back to the sewer system. The ZLD system also reduces the amount of water required for cooling. Additional recycled water is added to this treated blow-down water to make up for water evaporated from the cooling towers. The solid residue from the filtration and treatment process is then disposed of at an appropriate landfill. Additional treated water storage capacity, condensers, a crystallizer and associated pumps and piping would need to be added to the site. After discussions with the applicant and the City staff determined that the recently modified service agreements for recycled water use and modifications to equipment and operation protocols at LECEF insures that no incremental adverse impacts occur to the South Bay Water Recycling Program, to the WPCP, or to the effluent eventually discharged from the WPCP to the San Francisco Bay. The principal benefit of a ZLD system is a reduction of demand for the recycled water used for cooling tower operation, and elimination of the waste water return stream with its concentrated total dissolved solids (TDS). ZLD creates an additional solid waste stream, and would require retrofitting the currently operational LECEF. The redesign and adding of new equipment could add substantial costs to the project. Staff determined that the potential benefits of a ZLD system were not significantly greater that those already achievable at the LECEF, including the beneficial use of the recycled water produced by the WPCP.

Dry Cooling Alternative

Dry cooling is an alternative means of reducing impacts to California's water supply through the use of air cooled condensers that eliminate the need for wet-cell cooling towers, and water for evaporative cooling. Dry cooling eliminates the need for the treated water storage system, drum-type condensers, and pumps associated with circulating the cooling water between the turbines and the cooling towers. The evaporative 6-cell cooling tower array is replaced by up to 30 air cooled condensers mounted above horizontal fans. Steam from the cooling water used in the combustion

process is directed through piping to the air cooled condensers. These individual fan and condenser housings are elevated over 100 feet above the ground with walls around the base to direct the flow of ambient air, used as the cooling mechanism, upward through the elevated fan units and across bundles of finned tubes which carry the steam. The ambient temperature air cools the steam resulting in condensation within the tubes. The resulting water is then used as make up water and re-circulated through the combustion cooling system. These unit fans may be 32 feet or more across. The amount of space required for the complete dry cooling array is considerably larger than for wet-cell cooling towers. The cost of dry cooling arrays may be double that of the evaporative cooling, and add a greater draw on the electrical output of the facility thereby reducing the power output to the grid. Visual impacts of dry cooling may be considerable due to the large area needed for the cells, and the high elevations for the steam ducts and finned cooling tubes. These attributes, and the fact that LECEF Phase 2 plans to continue the beneficial use of recycled water, make the design change impractical for this project.

NO PROJECT ALTERNATIVE

The California Independent System Operator (ISO) has analyzed the electric reliability problems of the greater San Jose area and concluded that more local generation is needed. Such generation greatly reduces stress on the transmission system and increases critical reliability margins. The LECEF project was licensed in an expedited process in 2002 to provide additional local generation, with attendant reliability benefits. The ISO and Energy Commission staff had previously identified the LECEF project location as an ideal location that would maximize the benefits of new generation for overall electricity grid reliability. The Commission has previously analyzed numerous San Jose area sites in the Metcalf Energy proceedings, and concluded that benefits of locating a project at the LECEF site included reduced transmission line losses and the ability to provide Bay Area grid reliability benefits (Metcalf Energy Center Commission Decision, p. 451, September 24, 2001).

The need for new generation in the region remains significant. Estimated need for the North San Jose area was estimated at 800 MW in 2004, rising to 900 MW by 2008. With the completion of the 120 MW PICO power plant, the North San Jose area will have approximately 420 MW of “internal” generating capacity. Even with the proposed conversion of LECEF to combined cycle mode adding an additional 140 MW local generation will only account for approximately 65 percent of the area’s peak power demand, requiring continued import of 300 MW in 2008 (PG&E, 2004, pp. 4 and 5).

If the project is not licensed (“no project”), the increased system reliability benefits of LECEF will be forgone, and new generation projects will presumably be needed in other San Jose locations. Moreover, the use of the site location near existing substations and switchyards would not be utilized to provide the additional 140 MW of electrical output the Phase 2 project would deliver from the LECEF facility.

If the project is licensed, it will continue to emit criteria pollutants into the greater San Jose region. These emissions will be slightly greater than those of the simple-cycle

facility the project augments. Although the facility is a modern and relatively clean gas-fired project these emissions may contribute to regional air pollution. The expected emissions may also add a slight contribution to nitrogen deposition on sensitive serpentine soils downwind of the project that host listed endangered species that rely on such soils. However, if the project is not licensed, it is relatively likely that additional generation sources will be built elsewhere in the region that will have similar environmental impacts. Moreover, it is doubtful that these future projects would have as beneficial a location for the purposes of transmission system reliability. If the locations of future generation capacity are less optimal, the system will be somewhat less efficient, requiring some level of generation greater than that of the addition of the 140 MW from the LECEF combined-cycle conversion to achieve a similar level of reliability.

The No Project Alternative under CEQA assumes that the LECEF project license to convert to combined-cycle is not approved and the power plant remains a 180 MW simple-cycle facility. In the CEQA analysis, the No Project Alternative is compared to the proposed project and determined to be superior, equivalent, or inferior to it. The CEQA Guidelines state that “the purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. §15126.6(i)). Toward that end, the No Project analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved…” (§15126.6(e)(2)).

The LECEF was constructed under the Energy Commission’s expedited power plant review process, which was intended to provide power within a short timeframe to serve California’s growing demand. The need for electricity capacity in the region, and the state, has not lessened. Estimated need for the North San Jose area is 800 MW in 2004, rising to 900 MW by 2008. The San Jose and Silicon Valley generally have an even greater need for additional local generation capacity (Metcalf Energy Center Commission Decision, p. 99, September 24, 2001).

In the original LECEF AFC, Calpine stated that the “No Project” Alternative would not provide increased peaking generation to serve the State’s electricity demand. Also, the “No Project” Alternative would eliminate the expected benefits that the LECEF project brings to San Jose and the Northeastern Transmission System Reinforcement Project service area, including increased property taxes, employment, sales taxes, and sales of services. Conversion to combined-cycle operation would add employment opportunity and provide an increase in local and regional purchases in support of the LECEF facility. The proposed combined-cycle LECEF would also provide an additional 140 MW of needed capacity to the North San Jose area. When all of the factors discussed above are considered, the project appears to be environmentally superior when compared to the “no project” alternative.

ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

LECEF has been constructed, has begun commercial operation, and on March 16, 2005 the Energy Commission approved the Phase 1 application for recertification of the license to operate as a simple-cycle project. The project discussed in this FSA would

convert the existing simple-cycle power plant to a combined-cycle facility, thereby increasing generation output by 140 MW. No alternative technology, site, or demand-reduction program provides a practical alternative, or has the ability to replace the 320 MW electrical output of the Phase 2 LECEF in the North San Jose area served by the project. Alternative generation typically has specific resource needs, environmental impacts, permitting difficulties, and intermittent availability. Therefore, these technologies do not fulfill a basic objective of the proposed project to provide, load-serving or load-following capability in order to ensure a reliable supply of electricity for north San Jose and California.

REFERENCES

Aspen, (Aspen Environmental Group). 2001. Draft report prepared for the California Energy Commission on assessment of alternative generation technologies, December, 2001.

Beck, Fredric, and Singh, Virinder et al. (Beck et al.). 2001. *Renewable Energy for California: Benefits, Status and Potential,* Washington, DC: Renewable Energy Policy Project, August 24, 2001. p. 17.

CEC (California Energy Commission). 2001. Commission Decision for Metcalf Energy Center, 99-AFC-3. Publication No. P800-01-023. p. 451.

CEC (California Energy Commission). 2005. Commission Decision for Los Esteros Critical Energy Facility II, Phase 1, 03-AFC-2. Publication No. CEC-800-2005-002-CMF. March 2005.

CEC (California Energy Commission). 2005. Draft Document: Cooling Water Alternatives. An Appendix prepared for the Final Staff Assessment for Blythe Energy Project Phase II, 02-AFC-1. Prepared by John Schoonmaker and John Kessler, April, 2005.

CEC (California Energy Commission). 2004a. Internet Website at http://www.energy.ca.gov/wind/overview.html.

____. 2004b. Internet Website at http://www.energy.ca.gov/maps/wind_map.html.

_____. 2004c. Internet Website at http://www.energy.ca.gov/development/biomass/biomass.html.

____. 2004d. Internet Website at http://www.energy.ca.gov/maps/geothermal_map.html.

PG&E (Pacific Gas & Electric Company) 2004. System Impact Study and Facilities Study for Silicon Valley Power/Calpine 230 kV Switching Station and LECEF Interconnection into PG&E's Los Esteros Substation. Updated Final Report, December 2, 2004.

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Lance Shaw and Alvin J.Greenberg, Ph.D.

INTRODUCTION

The Compliance Monitoring and Closure process Compliance Plan) have been established as part of the project general conditions of certification and is required by Public Resources Code section 25532. The plan provides a means for assuring that this facility is operated and closed in compliance with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions;
- establish requirements for facility closure plans; and
- specify conditions of certification that follow each technical area that contain the measures required to mitigate any and all potential adverse project impacts associated with operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for construction utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for

the occupants. Site mobilization is for temporary facilities and is, therefore, not considered construction.

GROUND DISTURBANCE

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

a. the installation of environmental monitoring equipment;

b. a soil or geological investigation;

c. a topographical survey;

d. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or

e. any work to provide access to the site for any of the purposes specified in a., b., c., or d.

START OF COMMERCIAL OPERATION[1]

For compliance monitoring purposes, “commercial operation” is that phase of project development which begins after the completion of start-up and commissioning, where the power plant has reached steady-state production of electricity with reliability at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

A Compliance Project Manager (CPM) will oversee the compliance monitoring and closure process of the facility and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy Commission Decision;

[1] A different definition of “Start of Commercial Operation,” may be included in the Air Quality (AQ) section (per District Rules or Federal Regulations). In that event, the definition included in the AQ section would only apply to that section.

2. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
3. documenting and tracking compliance filings;
4. ensuring that the compliance files are maintained and accessible; and
5. receiving and resolving complaints.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval the approval will involve all appropriate staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant or operation-related questions, and complaints or concerns.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

- all documents demonstrating compliance with any legal requirements relating to the operation of the facility;
- all monthly and annual compliance reports filed by the project owner;
- all complaints of noncompliance filed with the Energy Commission; and
- all petitions for project or condition changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate. A summary of the General Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section. The designation after each of the following summaries of the General Compliance Conditions (**COM-1, COM-2,** etc.) refers to the specific General Compliance Condition contained in **Compliance Table 1.**

GENERAL CONDITIONS OF CERTIFICATION

COM-1, Unrestricted Access

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the files and records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

COM-2, Compliance Record

The project owner shall maintain project files onsite, or at an alternative site approved by the CPM, for the life of the project unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents.

COM-3, Compliance Verification Submittals

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) specifically tailored to each AFC to ensure post-certification compliance with adopted conditions.

Verification of compliance with the conditions of certification can be accomplished by:

1. adhering to the procedures spelled out in the verification;
2. reporting on the work done and providing the pertinent documentation in annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
3. providing appropriate letters from delegate agencies verifying compliance;
4. Energy Commission staff audits of project records; and/or
5. Energy Commission staff inspections of mitigation or other evidence of mitigation.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Lance Shaw
Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

If the project owner desires Energy Commission staff action by a specific date (allowing sufficient lead time for the CPM to process the amendment to the conditions of certification) the owner shall so state in the submittal and include a detailed explanation of the effects on the project if this date is not met.

COM-4, Pre-construction Matrix, Tasks Prior to Start of Construction, and Compliance Reporting

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's first compliance submittal, and shall be submitted prior to the first pre-construction meeting, if one is held. It will be in the same format as the compliance matrix referenced below.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project construction.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

It is important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the Final Decision.

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

EMPLOYEE ORIENTATION

Environmental awareness orientation and training will be developed for presentation to new employees during project construction as approved by Energy Commission staff and described in the conditions for Biological, Cultural, and Paleontological resources. At the time this training is presented, the project owner's representative shall present information about the role of the Energy Commission's delegate Chief Building Official (CBO) for the project. The role and responsibilities of the CBO to enforce relevant portions of the Energy Commission Decision, the CBSC, and other relevant building and health and safety requirements shall be briefly presented. As part of that presentation, new employees shall be advised of the CBO's authority to halt project construction activities, either partially or totally, or take other corrective measures, as appropriate, if the CBO deems that such action is required to ensure compliance with the Energy Commission Decision, the CBSC, and other relevant building and health and safety requirements. At least 30 days prior to construction, the project owner shall submit the proposed script containing this information for CPM review and approval.

COM-5, Compliance Matrix

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., "not started," "in progress" or "completed" (include the date); and

8. the project's preconstruction and construction milestones, including dates and status (if milestones are required).

Satisfied conditions do not need to be included in the compliance matrix after they have been identified as satisfied in at least one monthly or in one annual compliance report.

COM-6, Monthly Compliance Report

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the **Key Events List. The Key Events List form is found at the end of this section.**

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and ten copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification;
4. a list of conditions that have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. a listing of the month's additions to the on-site compliance file;
10. any requests, with justification, to dispose of items that are required to be maintained in the project owner's compliance file; and
11. a listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolutions of any resolved complaints, and the status of any unresolved complaints.

COM-7, Annual Compliance Report

After construction is complete, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file;
9. an evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section]; and
10. a listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved complaints, and the status of any unresolved complaints.

COM-8, Construction and Operation Security Plan

At least 14 days prior to commencing construction, a site-specific Security Plan for the construction phase shall be submitted to the CPM for approval. At least 30 days prior to the initial receipt of hazardous materials on-site, a site-specific Security Plan for the operational phase shall be submitted to the CPM for review and approval.

Construction Security Plan

The Construction Security Plan shall include the following:

1. site fencing enclosing the construction area;
2. use of security guards;
3. check-in procedure or tag system for construction personnel and visitors;

4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. evacuation procedures.

Operation Security Plan

1. The Operations Security Plan shall include the following:
2. permanent site fencing and security gate;
3. evacuation procedures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. fire alarm monitoring system;
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 for vendors; and
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. In addition, in order to ensure adequate perimeter security, the Security Plan shall include either:
    a. guards on-site 24 hours per day, 7 days per week <u>or</u>
    b. operations staff on-site 24 hours per day 7 days per week **plus** all of the following:
        - The entire power plant perimeter is protected by a chain-link fence topped with barbed or concertina wire.
        - The site is equipped with security cameras that can zoom, have low-light function, and are recorded, viewed, and controlled from the power plant control room and which are positioned such that they cover 100% of the perimeter fenceline, the aqueous ammonia storage tank, and the entrance to the control room.
        - Perimeter breach detectors (either infrared or microwave) that are placed inside along the entire perimeter fence and report to the control room.

Vulnerability Assessment

In addition, in order to determine the level of security appropriate for this power plant, the project owner shall prepare a Vulnerability Assessment and implement site security measures that is consistent with guidelines including but not limited to the Chemical Accident Prevention Alert regarding Site Security (EPA 2000), the Department of

Justice Chemical Facility Vulnerability Assessment Methodology (US DOJ 2002), the North American Electric Reliability Council Security Guidelines for the Electricity Sector (NAERC 2002), the U.S. Department of Energy Vulnerability Assessment Methodology for Electric Power Infrastructure (DOE 2002), and from the California Energy Commission. The level of security to be implemented is a function of the likelihood of an adversary attack, the likelihood of adversary success in causing a catastrophic event, and the severity of consequences of that event. This Vulnerability Assessment will be based, in part, on the use and storage of certain quantities of acutely hazardous materials as described by the California Accidental Release Prevention Program (Cal-ARP, Health and Safety Code section 25531). Thus, the results of the off-site consequence analysis prepared as part of the Risk Management Plan (RMP) will be used to determine the severity of consequences of a catastrophic event and hence the level of security measures to be provided.

The Project Owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the Security Plan. The CPM may authorize modifications to these measures, or may recommend additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

The Project Owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the Security Plan. The CPM may authorize modifications to these measures, or may recommend additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

COM-9, Confidential Information

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

COM-10, Department of Fish and Game Filing Fee

If required pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of $850. The payment instrument shall be provided to the Energy Commission's Siting Project Manager (PM), not the CPM, at the time of project certification and shall be made payable to the California Department of Fish and Game. The PM will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision.

COM-11, Reporting of Complaints, Notices, and Citations

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during

operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to the CPM who will update the web page.

In addition to the annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unplanned temporary closure and unplanned permanent closure**.**

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or an emergency.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner remains accountable for implementing the on-site contingency plan. It can also

include unplanned closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

GENERAL CONDITIONS FOR FACILITY CLOSURE

COM-12, Planned Closure

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Energy Commission approval of the facility closure plan is obtained.

COM-13, Unplanned Temporary Closure/On-Site Contingency Plan

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all

necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall resubmit an on-site contingency plan for CPM review and approval. The plan shall be submitted within 60 days (or other time agreed to by the CPM) after certification. The approved plan must be in place within 120 days after recertification of project operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. (Also see the analysis for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

COM-14, Unplanned Permanent Closure/On-Site Contingency Plan

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction monitoring of the project, Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Commission staff retains CBO authority when selecting a delegate CBO including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental control when conducting project monitoring.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

Informal Dispute Resolution Procedure

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

Request for Informal Investigation

Any individual, group, or agency may request that the Energy Commission conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and, within seven working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within 48 hours, followed by a written report filed within seven days.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Energy Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Cal. Code Regs., tit. 20, §§ 1232-1236).

POST CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION: AMENDMENTS, OWNERSHIP CHANGES, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify project design, operation or performance requirements, change any condition of certification and to transfer ownership or operational control of the facility. It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769. Implementation of a project modification without first securing Energy Commission or Energy Commission staff approval may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for **amendments** and for **insignificant project changes** as specified below. For verification changes, a letter from the project owner is sufficient. In all cases, changes should not be implemented until approved by the Commission or in the case of a verification change, by the CPM. The petition or letter requesting a change should be submitted to the CPM, who will file it with the Energy Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below.

AMENDMENT

The project owner shall petition the energy commission, pursuant to Title 20, California Code of Regulations, Section 1769, when proposing modifications to project design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full commission. This process takes approximately two to three months to complete, and possibly longer for complex project modifications.

CHANGE OF OWNERSHIP

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process takes approximately one month to complete, and requires public notice and approval by the full commission.

INSIGNIFICANT PROJECT CHANGE

Modifications that do not result in deletions or changes to conditions of certification, and that are compliant with laws, ordinances, regulations and standards, and do not require any additional mitigation, may be processed as insignificant project changes. The CPM, after review and concurrence with technical staff may issue a notice of insignificant project change pursuant to section 1769(a) (2). This process requires a 14-day public review of the Notice of Insignificant Project Change of staff's intention to approve the modification unless substantive objections are filed. If substantial objections are filed the notification must be heard at a Public Business Meeting and approved by the Commission.

VERIFICATION CHANGE

A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification. This process usually takes less than five working days to complete.

COM-6, KEY EVENTS LIST

PROJECT: _____

DOCKET # _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date/Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID AND INTERCONNECTION	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
COMPLETE GAS PIPELINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

TABLE 1
COMPLIANCE SECTION
SUMMARY of GENERAL CONDITIONS OF CERTIFICATION

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-1	4	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COM-2	4	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COM-3	4	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether the condition was satisfied by work performed by the project owner or his agent.
COM-4	5	Pre-construction Matrix, Tasks Prior to Start of Construction , and Compliance Reporting	Construction shall not commence until all of the following activities/submittals have been completed: ▪ property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns; ▪ a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction; ▪ all pre-construction conditions have been complied with; and ▪ the CPM has issued a letter to the project owner authorizing construction.
COM-5	6	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COM-6	6	Monthly Compliance Report	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List (see page 19).

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-7	7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.
COM-8	8	Security Plans	Thirty days prior to commencing construction, the project owner shall submit a Security Plan for the construction phase. Sixty days prior to initial receipt of hazardous material on site, the project owner shall submit a Security Plan & Vulnerability Assessment for the operational phase.
COM-9	10	Confidential Information	Any information the project owner deems confidential shall be submitted to the Dockets Unit with an application for confidentiality.
COM-10	10	Dept of Fish and Game Filing Fee	The project owner shall pay a filing fee of $850 at the time of project certification.
COM-11	10	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COM-12	11	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least twelve months prior to commencement of a planned closure.
COM-13	12	Unplanned Temporary Closure/On-site Contingency Plan	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COM-14	13	Unplanned Permanent Closure/On-site Contingency Plan	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: Los Esteros Critical Energy Facility AFC Number: (03-AFC-2)
COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date and time complaint received: _____ Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):
Findings of investigation by plant personnel: Indicate if complaint relates to violation of Energy Commission requirement: Date complainant contacted to discuss findings: _____
Description of corrective measures taken or other complaint resolution: Indicate if complainant agrees with proposed resolution: If not, explain: Other relevant information:
If corrective action necessary, date completed:_____ Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date:_____

(Attach additional pages and supporting documentation, as required.)

LOS ESTEROS CRITICAL ENERGY FACILITY PHASE 2
FINAL STAFF ASSESSMENT
PREPARATION TEAM

Executive Summary ..... Robert Worl

Introduction ..... Robert Worl

Project Description ..... Robert Worl

Air Quality ..... Gabriel D. Taylor

Biological Resources ..... Natasha Nelson

Cultural Resources ..... Dorothy Torres

Hazardous Materials ..... Geoff Lesh, P.E. and Rick Tyler

Land Use ..... James Adams

Noise and Vibration ..... Steve Baker

Public Health ..... Ramesh Sundareswaran

Socioeconomics ..... Joseph Diamond and Dale Edwards

Soil and Water Resources ..... John Kessler

Traffic and Transportation ..... Amanda Stennick

Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.

Visual Resources ..... Eric Knight

Waste Management ..... Ramesh Sundareswaran

Worker Safety and Fire Protection ..... Geoff Lesh, P.E., and Rick Tyler

Facility Design ..... Kevin Robinson and Steve Baker

Geology and Paleontology ..... Patrick Pilling, Ph.D., P.E., G.E.

Power Plant Efficiency ..... Shahab Khoshmashrab

Power Plant Reliability ..... Shahab Khoshmashrab

Transmission System Engineering ..... Mark Hesters

Alternatives ..... Robert Worl

General Conditions..... Lance Shaw and Alvin Greenberg, Ph.D.

Project Assistant ..... Keith A. Muntz

DECLARATIONS AND RESUMES

DECLARATION OF
Robert Worl

I, **Robert Worl** declare as follows:

1. I am presently employed by the California Energy Commission in the **Environmental Office** of the Energy Facilities Siting and Environmental Protection Division as a **Project Manager, Siting.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Alternatives**, for the **Los Esteros Critical Energy Facility 2, Phase 2 project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 15 March 2005 Signed: Robert Worl

At: Sacramento, California

Robert C. Worl
Planner II, Siting Project Manager
California Energy Commission

Robert Worl has experience in energy facility siting, land use planning, socioeconomic assessment, CEQA process, health, social services and municipal waste operations. Researched laws and regulations for environmental, economic, social health issues.

CAREER HIGHLIGHTS AND HISTORY

Planner I and II, California Energy Commission, Siting May 2001 – Present
As project manager coordinating a resource specialist team evaluating Applications for Certification (AFC's) by power plant developers under Energy Commission guidelines. Coordination of evaluations and research efforts according to the process established to insure protection of public health, safety, and the environment and insuring timely development of needed electrical energy facilities.

Training Coordinator, Operator IV, Solid Waste Technician II, North Slope Borough and Piquniq Management Corp. (PMC) 1980-2000
First built and operated by the North Slope Borough (NSB) in 1979, and contracted to PMC in 1994, the facilities provided solid waste, landfill, water/wastewater and oily waste collection, treatment and disposal for the Prudhoe Bay oil field. Established training programs, assisted in development of hiring and personnel policies/practices, provided support to management during construction and commissioning of an industrial incineration system: In 1995 again recruited by PMC to assist during the retrofitting and restarting of the incinerator, development of collection routes and disposal practices for oily waste, and to assist with the training of new employees on all systems, equipment and operations.

Research and Organization Consultant, Robert Worl Associates 1989-1995
Work with municipal and non-profit organizations serving rural Alaska. Board/Management workshops focusing on communication, strategic planning, goal setting, and staff coaching. Additionally investigated funding sources, assisted with project definition, grant writing and organization for negotiations with State and federal sources. Researched community responses to topics such as AIDs, substance abuse, suicide, other health issues, and assisted in development of strategies for intervention.

Research Associate, Professional Growth Systems, Inc. (PGS) 1987-1989
Specializing in strategic planning, board and management organization, alignment training, and executive coaching for business and government. Conducted research and prepared a 5-year Long Range Health Plan for a regional health corporation. Researched and prepared workshops for hospital certificates of need (psychiatric).

NPR-A Coordinator, North Slope Borough 1977-1978
Represent local interests on a Federal-State-Local Government Task Force mandated by Congress to develop a long-range use plan for the newly created National Petroleum Reserve-Alaska. Lead Task Force, "Native Livelihood and Dependence". Prepared and conducted the Public Participation Plan, assisting with Congressional staff briefings

Director, Health-Social Services, North Slope Borough 1975-1977
Develop this new Department, included research, program planning, grant and proposal writing, and negotiation of contracts with Federal and State agencies. Recruited and trained staff, developed a regional health board. Expanded services to include over 20 programs and projects including major contracts with the State and the Indian Health Service. Provided services in 10 communities. Established a national precedent for municipal and tribal government working relationships

Publications:
Beaufort Sea Sociocultural Systems Update Analysis. Worl, Robert, Worl, Rosita, and Lonner, Thomas. Alaska OCS Socioeconomic Studies Program, Technical Report No. 64. Anchorage. 1981
Beaufort Sea Sociocultural Systems. Worl Associates (Robert and Rosita Worl). Alaska OCS Socioeconomic Studies Program, Technical Report Nos. 9 and 22. Anchorage: Mineral Management Service (formerly Bureau of Land Management) 1978
Native Livelihood and Dependence. Worl, Robert (Contributor and Editor), National Petroleum Reserve-Alaska, Land Use Study, Anchorage: Bureau of Land Management. 1978

EDUCATION AND ADDITIONAL INFORMATION

BA degree, Central Washington State College
2 years graduate study, University of Alaska-Anchorage
Additional Courses: Advanced Land Use Planning and Administration, Hazardous Waste Operation and Emergency Response (HAZWOPR) Confined Space, H2S, CPR and First Aid

DECLARATION OF
Gabriel Taylor

I, Gabriel Taylor, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Protection Office of the Systems Assessment and Facilities Siting Division as a Mechanical Engineer.

2. I prepared the staff testimony on Air Quality for Phase 2 of the Los Esteros Critical Energy Facility based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and professional experience and knowledge.

3. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5 24.05 Signed: MRinge for G Taylor

At: Sacramento, California

Gabriel D. Taylor

1516 9th Street, MS 40, Sacramento, CA 95814
gtaylor@energy.state.ca.us
(916) 654-4482

OBJECTIVE

A position involving detailed problem solving, technical analysis and hands-on engineering with opportunities for professional growth.

EMPLOYMENT HISTORY

California Energy Commission, MECHANICAL ENGINEER, Sacramento, CA (Dec. 1999 – Present)
Systems Assessment & Facility Siting Division, Air Quality section. Reviewed and analyzed permit amendments and Applications For Certification (AFC) for power plants of greater then 50 MW output. Testified as an expert witness in support of my analyses.

General Electric Nuclear Energy, ENGINEERING CO-OP, San Jose, CA (Jan. – Aug. 1998)
Chemistry Technologies Group, Hydrogen Water Chemistry (HWC) division. Participated in the production process for HWC systems from the receipt of the purchase order through delivery. My duties included mechanical design & verification, AutoCAD drafting, complete document issuing, and factory acceptance testing.

Laney College, TEACHING ASSISTANT, Oakland, CA (Jan. – Dec. 1996)
Engineering 45 (Properties of Materials): Repaired laboratory equipment (including six metallurgical microscopes), prepared laboratory exercises and conducted lab sessions, graded thirty to thirty-five homework assignments per week, tutored students individually and in groups.

University of California, Berkeley, TECHNICAL TUTOR, Berkeley, CA (Aug. – Dec. 1996)
Privately tutored college students in Calculus, Linear Algebra & Differential Equations, Physics, Chemistry, Properties of Materials, and Engineering Statics.

Peet's Coffee & Tea, SALES ASSOCIATE, Emeryville, CA (April 1994 – July 1996)

COMPUTER SKILLS

- Windows 3.1/95/98
- MS-DOS
- UNIX
- Mac OS
- AutoCAD 13/14
- Claris CAD
- MathCAD 6.0
- Visio
- MS Excel
- MS Power Point
- MS Word 97
- HP-VEE
- DOS Batch Programming
- FORTRAN 77/90
- Hardware Assembly
- Software Installation

EDUCATION

University of California, Berkeley
Bachelor of Science
Double Major: Mechanical Engineering and Materials Science & Engineering
3.12 UCB GPA (1993 – Graduation)

Peralta Community College (Fall 1993 – Fall 1996)
4.0 Overall GPA

TECHNICAL COURSE WORK

- Bonding, Crystallography & Crystal Defects
- Corrosion & Electrochemistry
- Electronic Techniques for Engineers
- Energy, Politics and Society
- Engineering Mechanics
- Experimental Materials Science Laboratory
- Experimentation & Measurement Laboratory
- Fluid Dynamics & Applied Fluid Dynamics
- Heat & Mass Transfer
- Mechanical Behavior & Processing of Materials
- Mechanical Engineering Design Laboratory
- Phase Transformation & Kinetics
- Properties of Materials
- Technical Communication & Writing
- Thermal Environmental Control Systems
- Thermodynamics

RECOGNITION & ACTIVITIES

- Published: "The Challenges Facing Hydroelectric Power" in The California Engineer (Fall 1997)
- Hazardous Waste Operations and Emergency Response Certified (HAZWOPER, Title 8 CCR 5192)
- President, UC Berkeley Materials Science & Engineering Association (MSEA) (Fall 1997)
- Industry Liaison, UC Berkeley Engineer's Joint Council (Fall 1997)
- MSEA Representative to the UC Berkeley Engineer's Joint Council (Spring 1997)
- Member of the UC Berkeley Materials Science & Engineering Association (MSEA)

DECLARATION OF
NATASHA NELSON

I, **NATASHA NELSON** declare as follows:

1. I am presently employed by the California Energy Commission in the **BIOLOGICAL RESOURCES UNIT** of the Systems Assessment and Facilities Siting Division as a **BIOLOGIST**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **BIOLOGICAL RESOURCES**, for the **LOS ESTEROS CRITICAL ENERGY FACILITY II - PHASE 2 (03-AFC-2)** 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: 4/6/05 Signed: Natasha Nelson

At: Sacramento, California

NATASHA NELSON
Planner II

Experienced in biological resource assessment including endangered species surveys, endangered species mitigation and monitoring, coordination with state and federal agencies, and riparian restoration. Educational background emphasized biological resources, general ecology, geographic information systems, and small mammals.

PROFESSIONAL EXPERIENCE

2001 – to date BIOLOGIST, California Energy Commission. I provide independent biological resource assessments of proposed energy plants and related facilities and review the implementation of biological resource conditions of certification required by the Warren-Alquist Act and the California Environmental Quality Act (CEQA). Once energy facilities are constructed and operating, I am responsible for making sure each facility operates in compliance with associated biological resources conditions of certification. These conditions of certification involve endangered species protection, habitat restoration and monitoring, off-site habitat compensation, and wildlife surveys. Agency permit coordination is an important component of my work..

1997 - 2001 BIOLOGIST, Aspen Environmental Group. I was the project manager or technical writer for many projects that involved National Environmental Policy Act (NEPA) and CEQA documentation. The majority of projects were for utility infrastructure (e.g., power plants, transmission lines, petroleum pipelines) and included aspects of Section 404 Clean Water Act permitting and state or federal Endangered Species Act compliance. I performed reconnaissance level wildlife and plant surveys, and researched issues of concern. I also created adaptive management plans for wildlife and habitat restoration in desert and riparian areas.

1996 - 1997 BIOLOGIST, Bureau of Land Management. As the wildlife biologist for the West Mojave Coordinated Planning effort I gathered and synthesized data regarding the state- and federally-listed species in the Mojave desert. I updated and verified all mapping information used in the planning effort including species' range and occurrence data. Most mapping was done using ARC-INFO's AML language and the California Department of Fish and Game database programs (Rarefind and NDDB). During public meetings I gave overviews and presentations of my work to date.

EDUCATION

- B. S. **BIOLOGY**, 1993, Willamette University, Salem, Oregon
- M. S. **WILDLIFE SCIENCE**, 1996, Oregon State University, Corvallis, Oregon

PROFESSIONAL AFFILIATIONS

- Conservation Biology
- Society for Ecological Restoration

DECLARATION OF

Dorothy Torres

I, Dorothy Torres declare as follows:

I am presently employed by the California Energy Commission in the Environmental Office of the Systems Assessments and Facilities Siting Division as a Planner II.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I prepared the draft initial study on Cultural Resources for the Los Esteros Critical Energy Facility Phase 2 project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/24/05 Signed: Dorothy E. Torres

At: Sacramento, California

Dorothy E. Torres

EXPERIENCE:

September 2002-Present

Planner II: Cultural, Socioeconomic and Visual Unit, Systems Assessment and Facilities Division, California Energy Commission. Duties: As a Planner II, I Identify, describe, and analyze complex cultural resources issues related to electrical energy production facilities, alternative energy technologies, energy research and development and Commission programs. This includes the preparation of sections of initial studies, environmental impact reports and Commission reports.

In addition, I prepare independent assessments of the cultural resources aspects of Notices of Intention, Applications for Certification, and Small Power Plant Exemptions. The final analyses include the preparation and presentation of expert technical testimony, which is presented at Commission hearings.

I also coordinate and work with federal, state, regional and local governments; cultural resources related agencies; environmental organization and universities; Native American or other ethnic groups; archaeological or historical professional organizations; and members of the general public regarding energy-related issues to assure their input into the Commission power plant siting process and other Commission programs.

Moreover, I lead or participate in workshops and meetings concerning Commission projects, programs and policies, amongst and between project applicants, staff, other governmental agencies, private organizations, and the public.

In addition, I examine and evaluate existing and proposed laws, ordinances, regulations, standards, and policies pertinent to the visual, cultural aspects of proposed energy facilities on Commission programs. After permitting, I evaluate the licensee's compliance with conditions of certification for power plant facilities.

April 2001-August 2002

Planner I: Cultural, Socioeconomic and Visual Unit,

Systems Assessment and Facilities Division, California Energy Commission. Duties: I gather, organize and analyze cultural resources data and identify issues, impacts and mitigation measures ensuring compliance with the California Environmental Quality Act. I provide oversight for consultants working on siting applications in the area of cultural resources. I participate in workshops and meetings concerning Energy Commission projects and programs. In addition, I Interact with Division technical staff and staff representing other Divisions, local and regional government staff/decision makers, federal and state agency representatives and consultants/experts in the areas of anthropology, archaeology, history and related fields. I prepare written assessments of energy related documents.

December 1998-March 2001

Energy Analyst: Community and Cultural Resources Unit, Energy Facilities Siting and Environmental Protection Division, California Energy Commission. Duties: I assist in gathering, organizing and analyzing cultural resources data and identify issues, impacts and mitigation measures. I assist in coordinating with local governments, resource protection agencies, environmental organizations and business organizations. Furthermore, I participate in workshops and meetings concerning Energy Commission projects and programs. I evaluate existing and proposed laws, ordinances, regulations, standards, and policies pertinent to the cultural resource aspect of proposed energy facilities. I prepare written assessments of energy related documents.

EDUCATION:

Spring 1988 — M.A., Anthropology
California State University, Sacramento

Spring 1980 — B.A., Anthropology and History
California State University, Sacramento

Professional Organizations — Society for California Archaeology
Sacramento Archaeological Society

DECLARATION OF
Geoffrey Lesh

I, **Geoffrey Lesh** declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Energy Facilities Siting and Environmental Protection Division as a **Mechanical Engineer.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Hazardous Materials Management** and the **Worker Safety and Fire Protection** Sections for the **Los Esteros Critical Energy Facility, Phase 2 project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Geoffrey Lesh Signed: 5/23/05

At: Sacramento, California

Geoffrey Lesh, P.E.
Mechanical Engineer

WORK HISTORY

California Energy Commission Mechanical Engineer 2002 - Current
• Review and analyze applicants' plans for safe management of hazardous materials, and for protecting worker safety.

Self-Employed Independent Investor 2000 - 2002
• Wrote market analysis computer software and traded personal account.

Read-Rite Corp Wafer Engineering Manager 1994 - 2000
• Designed and developed wafer manufacturing processes for computer data storage systems. Managed team of engineers and technicians responsible for developing wet and dry chemical processes for manufacturing, including process and safety documentation.
• Managed process and equipment selection for manufacturing processes.
• Processes included vacuum processed metals and ceramics, grinding-polishing, plating, etching, encapsulation, process troubleshooting, and SPC reporting.

Dastek Corp (Komag Joint Venture Start-up) Wafer Engineering Manager 1992 - 1994
• Developed wafer processes for new technology recording head for hard disk drives.
• Managed team of engineers and technicians.
• This position included start-up of wafer fab, including line layout, purchase, installation, and startup of new process equipment, etc.

Komag, Inc Alloy Development Manager 1989 - 1992
• Developed new vacuum-deposited recording alloys
• Responsible for planning and carrying-out tests, designing experiments, analyzing results, managing test lab conducting materials characterizations.
• Extensive process modeling and data analysis.

Verbatim Corp (Kodak) Process Development Manager 1983 - 1989
• Mechanical engineering for computer disk manufacturing, including product, process, and equipment including metal-ceramic-plastic processes for optical disk development.
• Production processes included plating, metal evaporation, reactive sputtering, laser-based photolithography, injection molding.
• Steering Committee Member, *Center for Magnetic Recording Research, UC San Diego*

IBM Corp Mechanical/Process Engineer 1977 - 1983
• Product development for photocopiers and computer tape-storage systems.

EDUCATION

Stanford University, Master of Science Degree	Materials Science and Engineering
UC-Berkeley, Bachelor of Science Degree (Double Major)	Mechanical Engineering, Materials Science and Engineering
University of Santa Clara, Graduate Certificate	Magnetic Recording Engineering
Registered Professional Engineer, California	Mechanical #M32576 Metallurgical #MT1940

DECLARATION OF
Rick Tyler

I, Rick Tyler declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Energy Facilities Siting and Environmental Protection Division as a **Senior Mechanical Engineer.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I supervised the preparation of the staff testimony on **Hazardous Materials Management** and the **Worker Safety and Fire Protection** Sections for the **Los Esteros Critical Energy Facility, Phase 2** project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/24/05 Signed: _____

At: Sacramento, California

RICK TYLER

Associate Mechanical Engineer

CALIFORNIA ENERGY COMMISSION
430 Ashore Ave.
Sacramento, California 95831
(916) 392-1663

EDUCATION B.S., Mechanical Engineering, California State University, Sacramento. Extra course work in Statistics, Instrumentation, Technical Writing, Management; Toxicology, Risk Assessment, Environmental Chemistry, Hazardous Materials Management, Noise Measurement, and regulations regarding control of toxic substances.

Near completion of course work necessary to obtain a certificate in hazardous materials management from University of California, Davis.

EXPERIENCE

Jan. 1998-Present

California Energy Commission - Associate Mechanical Engineer
Energy Facility Siting and Environmental Protection Division

Responsible for review of Applications for Certification (applications for permitting) for large power plants including the review of handling practices associated with the use of hazardous and acutely hazardous materials, loss prevention, safety management practices, design of engineered equipment and safety systems associated with equipment involving hazardous materials use, evaluation of the potential for impacts associated with accidental releases and preparation and presentation of expert witness testimony and conditions of certification. Review of compliance submittals regarding conditions of certifications for hazardous materials handling, including Risk Management Plans Process Safety Management.

April 1985-Jan. 1998

California Energy Commission - Health and Safety
Program Specialist; Energy Facility Siting and Environmental Protection Division.

Responsible for review of Public Health Risk Assessments, air quality, noise, industrial safety, and hazardous materials handling of Environmental Impact Reports on large power generating and waste to energy facilities, evaluation of health effects data related to toxic substances, development of recommendations regarding safe levels of exposure, effectiveness of measures to control criteria and non-criteria pollutants, emission factors, multimedia exposure models. Preparation of testimony providing Staff's position regarding public health, noise, industrial safety, hazardous materials handling, and air quality issues associated with proposed power plants. Advise Commissioners, Management, other Staff and the public regarding issues related to health risk assessment of hazardous materials handling.

Nov. 1977-
April 1985

California Air Resources Board - Engineer (last 4 years Associate level)

Responsible for testing to determine pollution emission levels at major industrial facilities; including planning, supervision of field personnel, report preparation and case development for litigation; evaluate, select and acceptance-test instruments prior to purchase; design of instrumentation systems and oversight of their repair and maintenance; conduct inspections of industrial facilities to determine compliance with applicable pollution control regulations; improved quality assurance measures; selected and programmed a computer system to automate data collection and reduction; developed regulatory procedures and the instrument system necessary to certify and audit independent testing companies; prepared regulatory proposals and other presentations to classes at professional symposia and directly to the Air Resources Board at public hearings. As state representative, coordinated efforts with federal, local, and industrial representatives.

PROFESSIONAL AFFILIATIONS/ LICENSES

Past President, Professional Engineers in California
Government Fort Sutter Section;
Past Chairman, Legislative Committee for Professional Association of Air Quality Specialists. Have passed the Engineer in Training exam.

PUBLICATIONS, PROFESSIONAL PRESINTATIONS AND ACCOMPLISHMENTS

Authored staff reports published by the California Air Resources Board and presented papers regarding continuous emission monitoring at symposiums.

Authored a paper entitled "A Comprehensive Approach to Health Risk Assessment", presented at the New York Conference on Solid Waste Management and Materials Policy.

Authored a paper entitled "Risk Assessment A Tool For Decision Makers" at the Association of Environmental Professionals AEP Conference on Public Policy and Environmental Challenges.

Conducted a seminar at University of California, Los Angeles for the Doctoral programs in Environmental Science and Public Health on the subject of "Health Risk Assessment".

Authored a paper entitled "Uncertainty Analysis -An Essential Component of Health Risk Assessment and Risk Management" presented at the EPA/ORNL expert workshop on Risk Assessment for Municipal Waste Combustion: Deposition, Uncertainty, and Research Needs.

Presented a talk on off-site consequence analysis for extremely hazardous materials releases. Presented at the workshop for administering agencies conducted by the City of Los Angeles Fire Department.

Evaluated, provided analysis and testimony regarding public health and hazardous materials management issues associated with the permitting of more than 20 major power plants throughout California.

Developed Departmental policy, prepared policy documents, regulations, staff instruction, and other guidance documents and reference materials for use in evaluation of public health and hazardous materials management aspects of proposed power plants.

Project Manager on contracts totaling more than $500,000.

RES.RT

DECLARATION OF
James Adams

I, James Adams declare as follows:

1. I am presently employed by the California Energy Commission in the **Land Use and Traffic and Transportation Unit** of the Office of the Systems Assessments and Facilities Siting Division as a **Planner I**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Land Use**, for the **Los Esteros Critical Energy, Phase 2 Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/24/05 Signed: James Adams by DCDiaz

At: Sacramento, California

James S. Adams
Environmental Protection Office
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5504
PH (916) 653-0702, FAX (916) 654-3882
Jadams@energy.state.ca.us

5/1999
Present **Environmental Planner**
Review applications for certification to acquire permits from the California Energy Commission to build electric generating power plants. Specific technical fields include socioeconomics and traffic and transportation.

11/1997
Present **Energy and Resource Consultant**
Provide clients with technical expertise on various issues related to natural resource use and development. Current activities include managing an Intervention by the Redwood Alliance before the California Public Utilities Commission regarding the decommissioning of the Humboldt Bay Power Plant's nuclear reactor.

9/1994--
10/1997 **Senior Analyst - Safe Energy Communication Council (SECC)**
Responsible for developing and/or implementing campaigns on various energy issues involving the promotion of energy efficiency and renewable energy and advocating less reliance on nuclear power. Managed educational outreach efforts to newspaper editorial writers throughout the U.S. to encourage coverage of energy issues. Participated in meetings and negotiations with key Clinton administration officials, members of Congress and staff, national coalitions, and grassroots organizations on important energy issues (e.g. U.S. Department of Energy Budget for Fiscal Years 1996-1998). Successfully raised $140,000 from private foundations to support SECC activities.

6/1978--
12/1992 **Principal Consultant - Redwood Alliance**
Provided consulting services to the Alliance; a renewable energy/political advocacy organization. Major responsibilities included managing and/or participating in several interventions/appearances before the California Public Utilities Commission, California Energy Commission, California Legislature, U.S. Congress and the U.S. Nuclear Regulatory Commission. Issues included electric utility planning options, greater reliance on energy efficiency and renewable energy, nuclear power economic analyses, decommissioning cost estimates, and nuclear waste management and disposal.

2/1983--
8/1986 **Natural Resource Specialist**
Assisted private consulting, firms, non-profit corporations and government agencies in various projects related to the enhancement and protection of national forests in Northern California and Southern Oregon. This included contracts with the U.S. Forest Service, Fish and Wildlife Service, National Park Service, the California Coastal Conservancy, and private landowners.

6/1978--
present Consultant/Journalist/Paralegal/Lobbyist
Throughout the period of work outlined above, I have written a considerable amount of news articles and reports connected to ongoing-projects and issues of personal interest. The leg, al/administrative interventions have required extensive paralegal work to support attorneys, and technical expertise to identify and assist consultants. In addition, many of the projects required consulting services and lobbying, at the local, state and federal level whenever necessary, as well as working with the print and television media as appropriate.

From 1978 through 1984 1 served on the Board of Directors for two locals non-profit agencies devoted to sustainable community development, Redwood Community Development Council and Redwood Community Action Agency (RCAA). I also was hired on staff at RCAA as a natural resource specialist which is explained more fully above. I am proficient with computers, printers, fax machines and related equipment.

EDUCATION

M.A. Social Science. Political science and natural resources emphasis. California State University at Humboldt. Graduated December 1988.

B.A. Political Science. Political and economic aspects of natural resource development, with a particular emphasis in forest ecology and appropriate technology. California State University at Humboldt. Graduated June 1978.

Academic Honors. Member of PI GAMMU MU Honor Society since 1986.

MILITARY SERVICE

7/1969--
9/1975 U.S. Navy. Air Traffic Controller.
Honorable Discharge.

DECLARATION OF
Steve Baker

I, Steve Baker, declare as follows:

I am presently employed by the California Energy Commission in the Engineering Office of the Systems Assessment and Facilities Siting Division as a Senior Mechanical Engineer.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I prepared the staff testimony on **NOISE AND VIBRATION**, and supervised the preparation of the staff testimony on **POWER PLANT EFFICIENCY, POWER PLANT RELIABILITY** and **FACILITY DESIGN**, for the Los Esteros Critical Energy Facility 2 Phase 2 Combined Cycle Conversion project based on my independent analysis of the Application and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

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: February 23 2005 Signed: Steve Baker

At: Sacramento, California

STEVE BAKER, P.E.
Senior Mechanical Engineer

Experience Summary

Thirty 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, Siting & Environmental Division - California Energy Commission

Technical lead person for the analysis of generating capacity, reliability, efficiency, noise, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases. Key contributor to Commission's investigation into market impediments to the deployment of advanced high-efficiency generating technologies.

1987 to 1990--Generation Systems/Facility Design Unit Supervisor, Siting & Environmental Division - California Energy Commission

Responsible for supervising the analysis of generating capacity, reliability, efficiency, safety, and mechanical, civil/structural, and geotechnical engineering aspects of power plant siting cases.

1981-1986--Operations Manager, Alternate Energy - Santa Fe Pacific Realty Corporation

Participated in and supervised identification, evaluation and feasibility analysis, licensing and permitting of hydroelectric, geothermal, windpower and biomass power projects.

1974-1981--Mechanical Engineer, Quality Engineer - Bechtel Power Corporation and Bechtel National, Inc.

Wrote equipment specifications, drew flow diagrams and P&ID's, performed system design and safety analysis for nuclear power plants and nuclear fuel processing plant. Wrote and implemented QA/QC procedures for nuclear power plant. Participated in construction/startup of large coal-fired power plant.

DECLARATION OF
Ramesh Sundareswaran

I, **Ramesh Sundareswaran** declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Systems Assessment & Facilities Siting Division as a Health & Safety Program Specialist II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimonies on Public Health and Waste Management, for the LECEF 2 phase project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 3-23-05 Signed: S. R

At: Sacramento, California

RAMESH SUNDARESWARAN

SUMMARY

Over 17 years of progressively responsible experience in management, organizational, technical and policy areas related to urban environmental management and planning, pollution control, regulatory compliance and chemical engineering. Consulting experience, government experience, and teaching experience.

EMPLOYMENT

6/00-present *Associate(California Energy Commission, Sacramento,CA)*
Provided expert technical analyses/opinions of health and safety impacts on the public and facility workers, stemming from the use and transport of hazardous materials and adoption of fire prevention strategies as encountered in power generation and energy resource use. Conducted engineering risk assessments in determing health and safety risks. Prepared and presented expert witness testimonies and made recommendations to the Commission during proceedings concerning regulatory compliance of power plants.

12/97-6/00 *Associate(SF Regional Water Quality Control Board, Oakland,CA)*
Performed a wide variety of consultative, advisory and evaluative duties in the areas of mitigation and preservation of impacts on public health and safety and the environment due to hazardous and toxic chemical usage/release. Used risk-based decision making in addressing human health and ecological risk issues. Provided testimony in formal hearings regarding regulatory compliance of responsible parties. Coordinated with other public agencies and informed and involved the public in addressing environmental risks, mitigation and prevention.

6/92 -12/97 *Group Manager/ Senior Engineer (BPS Inc., Torrance, CA)*
Developed, planned, coordinated and executed various projects in the areas of environmental protection, health and safety, pollution prevention and regulatory compliance. Directed staff in the preparation

of workplans, reports, process designs, bids and specifications for projects. Liaised with governmental agencies and negotiated environmental permits and variances for clients. Advised clients on regulatory interpretations. Testified as fact and expert witness in environmental litigations. Oversight and supervision of staff, subcontractors and vendors in completion of projects. Responsible for operations of environmental engineering group, P&L, strategy and business development and also technical and cost proposal writing.

4/90-6/92 *Project Manager (Dames & Moore, S. Ana, CA)*
Served as technical lead and also provided project team member support for various environmental engineering and industrial safety projects. Also managed and oversaw projects for technical, quality and financial performance.

8/88-4/90 *Project Manager (JKB Assoc., Carson, CA)*
Provided management and technical support for various projects ranging from environmental assessments to rehabilitation of impaired natural resources. Controlled project budget/schedule/performance.

6/88-8/88 *Hazardous Waste Specialist (Orange County Health Care Agency, S. Ana, CA)*
Rendered regulatory oversight for various projects to protect public health, safety and environment. Involved in policy-making and development of environmental regulations.

1/87-6/88 *Instructor (US Environmental Protection Agency(USEPA)Air Pollution Training Institute, San Luis Obispo, CA)*
Taught various air pollution courses to both industry and government. Assisted course director in program administration.

OTHER EMPLOYMENT

Marketed corrosion mitigation technologies to the oil and gas industries in South East Asia for over 6 years.

EDUCATION

1987-1988	Master of Engineering, Environmental Engineering, California Polytechnic State University, San Luis Obispo, CA
1980-1982	Master of Business Administration, Armstrong University, Berkeley, CA
1974-1979	Bachelor of Chemical Engineering, Kakatiya University, India

PROFESSIONAL AFFILIATIONS

- Board of Engineers, Malaysia
- American Institute of Chemical Engineers
- American Society of Safety Engineers
- USEPA's Industrial Accident Release Prevention Requirements peer reviewer
- Expert panel member on USEPA's solvent extraction treatability testing guidance document
- World Environment Center
- Registered Environmental Assessor, State of California (in progress)

DECLARATION OF

Joseph Diamond, Ph. D.

I, Joseph Diamond, Ph. D. declare as follows:

I am presently employed by the California Energy Commission as a Planner II-Economist.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I helped prepared the Socioeconomics Final Staff Assessment (FSA) testimony on 5/16/2005 for the Los Esteros Critical Energy Facility (LECEF) Phase 2 project based on my independent analysis of the Application For Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/23/2005 Signed: Joseph Diamond Ph. D.

At: Sacramento, California

Joseph Diamond Ph. D.
Work: (916) 654-3877

Ph.D. with experience in economic policy.

BUSINESS AFFILIATION

California Energy Commission
1516 9th St. MS-40
Sacramento, CA 95814

EDUCATION

Michigan State University	Ph.D.	Resource Development
University of Rhode Island	M.A.	Economics
University of New Hampshire	B.A.	Economics

DECLARATION OF
John S. Kessler

I, **John S. Kessler**, declare as follows:

1. I am presently a consultant employed by the California Energy Commission in the Water and Soil Resources Unit of the Energy Facilities Siting and Environmental Protection Division as a Senior Technical Specialist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil and Water Resources, for the **Los Esteros Critical Energy Facility, Phase 2 Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 23, 2005 Signed: John S. Kessler

At: Pollock Pines, California

JOHN S. KESSLER
Kessler and Associates, LLC
2801 Shady Lane
Pollock Pines, CA 95726
Ofc: (530) 644-2010, Fax: (530) 644-2051
Email: zephyr@plv1.innercite.com

EMPLOYMENT HISTORY:

May 2000 - Present: Principal - Kessler and Associates

Established Kessler and Associates to provide engineering, regulatory and operating services related to energy and associated water supply projects;

CEC - Valero Cogeneration Project, 01-AFC-05
Serving as Project Manager for the Soil and Water Resources Section in a 4-month certification proceeding of two combustion turbine generators rated at 51 MW each;

CEC - East Altamont Energy Center, 01-AFC-6
Serving as Project Manager for the Soil and Water Resources Section in a 12-month certification proceeding of a natural gas-fired, combined cycle generating facility rated at 1,100 MW;

CEC - Russell City Energy Center, 01-AFC-7
Serving as Project Manager for the Soil and Water Resources Section in a 6-month certification proceeding of a natural gas-fired, combined cycle generating facility rated at 600 MW;

CEC - Baldwin Hills, 01-EP-11
Served as a Soil and Water Resources Specialist in the 21-Day Emergency Peaker certification proceeding of two combustion turbine generators rated at 25 MW each;

CEC - Water Discharge Assessment of Coastal Power Plants – Executive Order 22-01
Served as Project Manager of Water Resources to assess the generation curtailments resulting from regulatory-required cooling water discharge limitations at various coastal thermal power plants;

CEC - Environmental Performance Report of California's Electric Generation Facilities
Co-authored the Water Resources Section, providing research and analysis of trends in power plant water resource utilization affected by technological changes, improved environmental safeguards, regulatory influences in market development, and diminishing supplies of fresh water;

CPUC – EIR for PG&E's Application for Authorization to Divest its Hydroelectric Generating Facilities and Related Assets
Served as Hazards Section Leader and Team Member of the Public Services and Utilities Section in preparing the EIR for considering PG&E's divestiture of its entire hydroelectric system;

Utica Power Authority – Dam Safety and Regulatory Compliance Services
Serving as UPA's Dam Safety Engineer and advising on various regulatory matters, including preparing a comprehensive regulatory checklist and schedule for compliance monitoring of applicable federal, state and local regulations and agreements.

El Dorado Irrigation District – Regulatory Permitting and Compliance Services
Supported EID with regulatory permitting including securing a FERC License Amendment for its El Dorado Hydroelecric Project. Project repairs, at a cost of over $20MM, are in-progress to repair flood damages to El Dorado Diversion Dam, construct a new 2-mile long tunnel, and rehabilitate two generating units and associated equipment. In addition, I served to support an application for renewal of the FERC License for the next 30 - 50 year term, and prepared new Emergency Action Plans for Caples, Silver, and Echo Lakes and El Dorado Forebay Dams in accordance with FERC's revised guidelines. I am also serving as part of a design team to improve flood protection at El Dorado Powerhouse, and am preparing a regulatory checklist and schedule for compliance monitoring.

Haida Corporation – Advisor for Project Feasibility, Regulatory and Strategic Matters
Served as co-author and preparer of a feasibility study and report for development of the Reynolds Creek Hydroelectric Project on Prince of Wales Island, Alaska; I also developed regulatory permitting and interconnection negotiating strategies in preparation for project construction;

September 1995 – April 2000: Hydroelectric Director - El Dorado Irrigation District
Managed operation, maintenance and regulatory activities and the acquisition of the El Dorado Hydroelectric Project from PG&E to EID; Acquisition activities included providing technical expertise in sale negotiations, FERC and CPUC regulatory approval processes, serving as EID's representative before hearings at the CPUC, and managing the preparation of the EIR to support EID's acquisition, operation and permanent repairs of the project; EID succeeded in acquiring the project on October 15, 1999 that included an unprecedented $15 Million payment from PG&E.

Aug. 1993 – Sept. 1995: Project Engineer - Northern California Power Agency
Managed planning of various enhancements and aquatic resource studies, including small hydro and fish screen improvements, associated with the North Fork Stanislaus River Hydroelectric Project; Coordinated initial development phases of new biomass generation for the Gridley Rice Straw Project in conjunction with D.O.E., private and U.C. Davis research groups which led to receiving a $1 Million federal grant for prototype development testing in the production of ethanol;

July 1984 – August 1993: Hydro Supervisor – Pacific Gas & Electric Company
Supervised the operations, maintenance, capital improvements and regulatory compliance activites for the El Dorado and Chili Bar Hydroelectric Projects;

Aug. 1979 – July 1984 - Hydraulic Engineer and Hydrographer/Hydrologist - PG&E
Managed various special capital projects within PG&E's and its water district/agency partner's hydroelectric systems; Coordinated the establishment of computerized operations modeling for PG&E's hydroelectric system for the purpose of predicting hydropower production in order to determine the most economical mix of hydro and thermal resources.

EDUCATION AND PROFESSIONAL CERTIFICATES:

State Of California Professional Civil Engineer, License No. C034897;

B.S. Civil Engineering, University Of California, Davis, June 1979;

A.A. Diablo Valley College, Pleasant Hill, June 1976;

DECLARATION OF
AMANDA STENNICK

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

1. I am presently employed by the California Energy Commission in the Environmental Protection of the Energy Facilities Siting and Environmental Protection Division as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **TRAFFIC AND TRANSPORTATION**, for the **LECEF 2 PHASE 1 STAFF ASSESSMENT** (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: 2/25/05 Signed: Amanda Stennick

At: Sacramento, California

AMANDA STENNICK

EDUCATION

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

WORK EXPERIENCE

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 suitable mitigation measures, preparation of testimony, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations. Recent work includes participation in the environmental justice task force, and 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; ongoing demographic research for environmental justice issues in siting cases.

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 impacts, identification of suitable mitigation measures, preparation of testimony, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations. Recent work includes participation in the environmental justice task force, and 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; ongoing demographic research for environmental justice issues in siting cases.

1992 to 1993

Environmental Analyst/Planner. Beak Consultants.

- Environmental Planner for EIR/EA for the Mammoth County Water District, involving the analyses of potential impacts resulting from lake water transfers and maintenance of instream flows in the Mammoth Lakes Basin. Prepared land use, socioeconomics,

recreation, and public services and utilities sections of EIR/EA.

- Environmental Planner for an Effluent Treatment Plant EIR for Simpson Paper company. Prepared land use, socioeconomics, recreation, public services and utilities, cumulative impacts sections, and mitigation monitoring.

- 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; compliance with federal, state, and local plans and policies.

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 a Specific Plan for 80-acre Mixed Use/Water Related development; and 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; 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 as 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.

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. Coordinate work efforts with the CEC, SMUD, and PG&E to develop environmental and siting policies for energy facilities and transmission lines; identify environmental impacts and appropriate mitigation measures.

1987 to 1989

Planner/Assistant Planner. Yolo County Community Development

- Planning liaison for Homestake Mining Company's (HMC) McLaughlin Mine. Conducted meetings on the Technical Review Panel's environmental monitoring of HMC's McLaughlin Mine, and

prepared staff reports on the implementation of use permit phasing, regarding issues of water quality, and impacts of the tailings pond on biologic resources. Specific tasks included site visits to monitor the revegetation plan and other mitigation measures as specified in the use permit; oral and written presentations 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)

PROFESSIONAL AFFILIATIONS

Association of Environmental Professionals
American Planning Association

DECLARATION OF

Dr. Obed Odoemelam

I, Obed Odoemelam declare as follows:

I am presently employed by the California Energy Commission in the **Environmental Protection Office** of the Systems Assessments and Facilities Siting Division as a **Staff Toxicologist**.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I helped prepare the staff testimony on **Transmission Line Safety and Nuisance** for the **Los Esteros Critical Energy Facility II Phase 2** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 24, 2005 Signed: Odoemelam

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989
The Present: California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF

Eric Knight

I, Eric Knight declare as follows:

1. I am presently employed by the California Energy Commission in the Siting Office of the Systems Assessments and Facilities Siting Division as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Visual Resources, for the Los Esteros Critical Energy Facility II Phase 2 Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 3-23-05 Signed: Eric Knight

At: Sacramento, California

ERIC KNIGHT

Planner II

EDUCATION

BA – Environmental Studies, California State University, Sacramento, 1993
Minor – Government, CSUS, 1993

PROFESSIONAL EDUCATION

CEQA Workshop, Association of Environmental Professionals, February 2004 and 1999
CEQA Overview and Update, UC Davis Extension Program, June 1998
Land Use Planning for Environmental Professionals, UC Davis Ext., May 1996
Introduction to ArcView and Avenue (GIS), ESRI, August 1995 and May 1998

EXPERIENCE

October 1998 to present

California Energy Commission, Systems Assessment & Facilities Siting Division
Planner II
(Planner I from Oct. 1998 to June 2000)

Responsible for preparing, or overseeing the preparation of, independent analyses of the potential visual and land use impacts of power plant projects and identifying measures to mitigate significant environmental effects. Other responsibilities include reviewing power plant applications for data adequacy, conducting field reconnaissance, writing information requests, participating in workshops with applicants and the public, preparing written testimony, presenting oral testimony at hearings, and monitoring compliance with conditions of certification.

June 1995 – October 1998

California Energy Commission, Energy Facilities Siting & Environmental Protection Division
Energy Analyst/Planner I

Promoted the use of urban planning tools by local governments. Assembled a GIS database for a community-planning project in San Diego. Authored a chapter to the National Wind Coordinating Committee's handbook *Permitting of Wind Energy Facilities*. Helped to write, edit and review various Energy Commission publications.

June 1994 – June 1995

Department of Toxic Substances Control, California Environmental Protection Agency
Program Technician
(Student Assistant: March 1993 – January 1994)

Provided regulatory assistance to hazardous waste generators, transporters and storage facility operators.

January 1992 – June 1992

Sacramento Valley Toxics Campaign
Student Intern

Filed public record requests with state and federal agencies. Conducted research and authored an article for the campaign newsletter. Helped to organize community meetings, press conferences and public outreach events.

DECLARATION OF
KEVIN ROBINSON

I, **Kevin Robinson**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Systems Assessment and Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I co-authored the staff testimony on **FACILITY DESIGN** for the **LOS ESTEROS CRITICAL ENERGY FACILITY 2 PHASE 2** based on my independent analysis of the Application for Certification and 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: 2-23-05 Signed: Kevin Robinson

At: Sacramento, California

KEVIN ROBINSON
Mechanical Engineer

Experience Summary

Two years experience in the electric generation field, including mechanical design, QA/QC and construction of hydroelectric plant systems; and engineering and policy analysis of geothermal, natural gas-fired and thermal power plant regulatory issues.

Education

- California State University, Chico—Bachelor of Science, Mechanical Engineering
- Certified EIT, California

Professional Experience

2001 to Present—Mechanical Engineer, Systems Assessment & Facility Siting Division, Engineering Section – California Energy Commission

Responsible for analysis of generating capacity, reliability, efficiency, and the mechanical, civil/structural engineering aspects of power plant siting cases.

2000 to 2001—Mechanical Engineer, Oroville Field Division, Engineering Section – California Department of Water Resources

Assist in the preparation of designs, technical specifications and cost estimates for mechanical equipment at a hydroelectric power plant. Coordinate the design, installation, and inspection of mechanical equipment. Assist in preparing test reports, and recommendations for corrective action.

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 Systems Assessment and 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 helped prepare the staff testimony on **GEOLOGY AND PALEONTOLOGY**, for the **LOS ESTEROS CRITICAL ENERGY FACILITY 2 PHASE 2** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 25, 2005 Signed: for Pat Pilling

At: Reno, Nevada

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

Executive Vice President
Principal Geotechnical Engineer

Education

- B.S. – Civil Engineering –1986 – Santa Clara University
- M.S. – Civil Engineering – 1991 – San Jose State University
- Ph.D. – Civil Engineering – 1997 – 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, "Development 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, "Documentation 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, "Lateral 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, "The 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, "Strain Wedge Model Formulation for Piles," Report No. CIS 91-11, University of Nevada, Reno.

Pilling, P. A., 1997, "The 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, "Dependent 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, "Expansion 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
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB** declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Systems Assessment and Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **POWER PLANT EFFICIENCY**, for the **LOS ESTEROS CRITICAL ENERGY FACILITY PHASE 2 PROJECT** based on my independent analysis of the Application for Certification and 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 issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 26, 2005 Signed: S. Khoshmashrab

At: Sacramento, California

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB** declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Systems Assessment and Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **POWER PLANT RELIABILITY**, for the **LOS ESTEROS CRITICAL ENERGY FACILITY PHASE 2 PROJECT** based on my independent analysis of the Application for Certification and 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 issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 26, 2005 Signed: S. Khoshmashrab

At: Sacramento, 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
Mark Hesters

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

1. I am presently employed by the California Energy Commission in the **Engineering OFFICE** of the Energy Facilities Siting and Environmental Protection Division as an **Associate 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 **Los Esteros Critical Energy Facility 2 Phase 2** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: MAY 23, 2005 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.

DECLARATION OF
Lance Shaw

I, Lance Shaw,

1. I am presently employed by the California Energy Commission in the **Compliance Office** of the Systems Assessments and Facilities Siting as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **General Conditions**, for the **Los Esteros II (Combined Cycle) Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 23 May 05 Signed: Lance Shaw

At: Sacramento, California

Resume of Lance Shaw
Compliance Project Manager (Planner II)

Experience Summary: **California Energy Commission (CEC)** – Oct. '02 to Present, Compliance Proj. Mgr. System Assessment & Facilities Siting Div. (SAFSD). Facilities Siting and Environmental Protection Division. Duties include: Managing multiple compliance projects including processing amendments to Commission Decisions. Reviewing Staff Assessments sections with emphasis on conditions of certification and verifications. Preparing and presenting testimony on compliance general conditions, and plant closure issues in public forums, workshops and hearings. Developing Memoranda of Understanding between the Commission and delegate Chief Building Officials (CBO) to ensure that projects are designed constructed and operated in conformance with the Commission Decision; all applicable laws, ordinances, regulations and standards; and the California Building Code.

CEC - Aug. '99 to Oct.'02, Siting Proj. Mgr., SAFSD. Duties included managing the work of multidisciplinary teams analyzing potential impacts of proposed power plants. Assisted on data adequacy on Morro Bay, and alternatives analysis on Three Mountain Power Project. Project manager of Blythe Energy Project, San Mateo Substation Project, Scott Substation Project, Rio Linda/Elverta Power Project, Roseville Energy Facility, and Avenal Energy Project.

Telecommunications Division of General Services – July '94 to July '99, Associate Telecom Engr., & Proj. Mgr. Duties included managing the work of teams designing and installing public service safety systems for several state agencies, including Dept. of Water Resources, Dept. of Corrections, Highway Patrol, and Dept. of Parks and Recreation. Before promoting to the Associate level, I worked as an electrical engineer.

U.S. Small Business Administration, Disaster Relief Div. – July '92- July '94, Construction Analyst (Team Lead) Trained, managed, and reviewed the work of as many as 30 engineers, architects, contractors and others working in "declared disaster" areas. Assessed disaster-related damage losses to business and homeowners, and recommending approvals for low interest loans, to restore the economy rapidly. I worked such disasters as Big Bear/ Landers earthquake of 6/92, Hurricane Iniki (on Kauai) 9/92, Dakota floods of 8/93, and Northridge earthquake of 1/94.

Prior to '92, I managed multi-disciplinary teams as a project manager in several industries. I have managed a mechanical engineering department, a marketing department, and a sale and service department, purchasing departments. I have successfully managed and performed in 5 Fortune 500 companies (Including GE's Nuclear Energy Div.) and start-ups. I worked 15 years in "Silicon Valley" managing high-technology project teams in the semiconductor wafer processing equipment industry, computer manufacturing, and semiconductor marketing engineering. As an adjunct (graduate and undergraduate) professor for the University of Phoenix's 6-campus Sacramento Valley Region, I earned the distinction as the most outstanding undergraduate business professor in 1998, and again in 1999. I was one of the editors on two best-selling business/creative books by Roger von Oech, Ph.D. "A Whack on the Side of the Head", and "A Kick in the Seat of the Pants". I wrote and got published two articles on creative parenting as a single joint-custody dad of two pre-schoolers.

Education: Bachelor of Science, Electrical Eng. – New Mexico State Univ. 1/68.
Master of Arts, Business Administration – Arizona State Univ. 8/69.